

CHANGES IN U.S. WEALTH WITH IMPLICATIONS FOR PORTFOLIO

REBALANCING

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CHANGES IN U.S. WEALTH WITH IMPLICATIONS FOR PORTFOLIO CONSTRUCTION

Abstract: From peak values in the third quarter of 2007 to the end of the first quarter of 2009, the nation's per capita net worth declined by approximately \$93,000. Within the "institutionally investible" subset of the nation's wealth, bonds increased share from 32% to 50%. Contrasting institutionally investible wealth to overall national wealth, institutional investors are still dramatically underweight to unlisted equity. After the full impact of FAS 157 is felt, this underweight may have actually increased during the financial crisis.

Introduction/Background

In portfolio construction it is helpful to periodically review the size of the different components of the investment universe. While naïve diversification¹ is seldom the final goal, knowing the relative weights of the investment universe enables one to see whether intended allocations are being achieved. This is a particularly timely exercise after dramatic drops in value during the recent financial crisis².

An approximation of the aggregate wealth of the United States can be constructed by combining the market value of six major segments of the investment universe: the stock market, the bond market broadly defined, non-securitized equity in businesses, the residential real estate market, the commercial real estate market³, and a residual "other"

¹ Naïve diversification is asset allocation based solely on the relative size of the asset class (or sub class) in the investment universe.

² On June 12, 2009, the Federal Reserve released its quarterly assessment of household wealth which was widely quoted in the trade press. For numerous reasons, that work is inappropriate for the institutional investor interested in asset allocation issues. For example, only the cash value of life insurance policies is included, not the underlying assets; no defined benefit pension fund assets are included; etc. See Changes in U.S. Family Finances from 2004 to 2007 for details on the 4000 person survey which underlies the Federal Reserve's approach to this estimation.

³ Including oil and gas, timber and other land related investments.

category⁴. From such a composite, it is a straight forward exercise to examine how the current financial crisis may suggest shifts in portfolio allocations.

This paper compares the peak value of each individual segment of U.S. wealth to its value at the end of the first quarter of 2009. It also compares the peak aggregate value of all segments to the current aggregate value over the same time period. Each major market segment is shown separately so that readers can easily compare the value estimates here with the primary sources for the particular segment. Double counting is then eliminated to arrive at the overall aggregate wealth estimate. Finally, “institutionally investible wealth” is shown as a subset of overall US wealth.

In this work, there is a trade off between being more current and having a more accurate estimate. Likewise, there are many judgments necessary to combine the different types of wealth. Footnotes explain the logic used allowing readers to adjust conclusions. Lastly, there is the question of levels of precision. Some of the segments allow considerably more precise estimates than others. This effort rounds everything to tenths of a trillion dollars for reasons that become readily apparent in the following discussions.

Reviewing the wealth of the US from a portfolio construction perspective, it is important to differentiate between aggregate wealth and investable wealth. Some items which contribute to the aggregate wealth of the US are not easily accessible by institutional investors. For example, millions of small unlisted businesses in the US certainly contribute to the aggregate wealth of the country but are not easily accessible for institutional investors. The distinction between how each component of wealth contributes to both aggregate and investable wealth is made in the appropriate section.

⁴ Cars, Art, Furniture, etc

The most important limitation of this work is its exclusively domestic focus. Unfortunately, the complexities of going global in constructing wealth estimates are formidable. For example, cross-border commercial bank short term lending is difficult to properly characterize. Equity markets have matured much faster than bond markets in most emerging countries, meaning that capturing private debt is considerably more difficult outside the US⁵. Most importantly, data on unlisted assets is far less dependable outside the US. Consequently, accurate coverage of the six major segments of global wealth awaits further development of both markets and data bases around the world.

Securitized Equity

The segment requiring the fewest independent judgments is publicly traded equity. The value of the public equity market in the US is calculated monthly by Wilshire Associates⁶. The Dow Jones Wilshire 5000 Index measures the performance of all U.S. equity securities with readily available price data and consists of all publicly traded US based companies excluding bulletin board issues⁷. The Wilshire 5000 base is its December 1980 capitalization of \$1.4 trillion. The current market value is approximately 1.17 times the current index value due to a change in the composition of the index over the years⁸.

⁵ See McKinsey and Company “Mapping Global Capital Markets”, October 2008, for a good look at the information available.

⁶ The fundamental characteristics of the Wilshire 5000 are available online at the end of each month. <http://www.wilshire.com/Indexes/Broad/Wilshire5000/Characteristics.html>

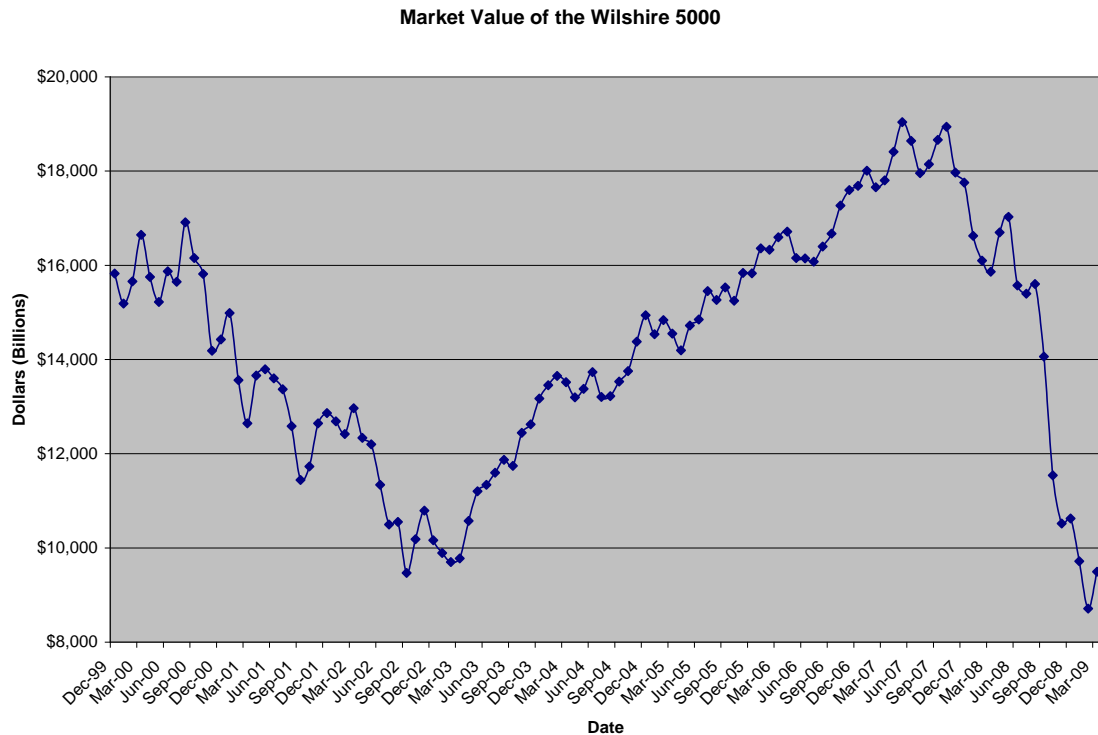
⁷ Bulletin Board issues are any publicly traded stock for which there is no readily available financial data.

⁸ The value of the index on any date is the product of the value of the index and the index multiplier. The index multiplier changes as new companies are added to the Wilshire 5000. For example Google was added to the Wilshire 5000 at the close of business 9/17/2004. At that time the full equity market cap of Google was a little under \$32 billion. This increase in market capitalization does not get included in the index value calculation. <http://www.wilshire.com/Indexes/Broad/Wilshire5000/Characteristics.html>

Note that news sources such as the Wall Street Journal may report either the index value or the market value of the Wilshire 5000.

The peak market value of securitized equity was \$19 trillion on May 31, 2007. The market reached a 52 week low of \$8.0 trillion on March 9, 2009⁹, a 58% drop from peak value. Securitized equity ended the first quarter of 2009 at \$9.5 trillion.

Figure 1



This Figure displays the monthly market value of the Wilshire 5000. The values above have been adjusted from the index value using that month's index multiplier.

As is obvious from figure 1 and a huge volume of academic literature, the stock market does not behave in a predictable manner. More troubling is the fact that a passive investment in the stock market has not provided positive returns over the past decade. To obtain a positive inflation adjusted return the passive investor would need to have held an investment since September 1996, even assuming no investment management fees and no

⁹ Source: Dow-Jones/Wilshire Associates website. The corresponding index values for the high and low are 15,806.69 and 6858.43 respectively.

income taxes.¹⁰ Obviously, this is a problem for even the most conservative “average in” long-hold investor¹¹ and is a primary motivation for considering alternate asset classes.

The public equity market contributes its full value to both the aggregate wealth and institutionally investable wealth of the US¹².

Debt Securities

While there are many ways to look at the bond markets, the most comprehensive enumeration is provided by the Federal Reserve. The Federal Reserve produces a complete accounting of the face value of all bonds, not just those traded in public markets. Of course bonds are seldom traded at exactly face value. The well known Barclay (Lehman) Aggregate Bond Index, AGG¹³ is the best tool for adjusting the face value of bonds to accurately reflect current market value¹⁴. To obtain a full accounting of the market value of debt, the face value of all bonds from the Federal Reserve is updated for the five quarters beginning with the first quarter of 2008 using growth in the market value of the AGG¹⁵.

¹⁰ The ongoing debate between Jeremy Siegel (Wharton—“Stocks for the Long Run”) and Zvi Bodie (Boston University) covers nicely the issues involved.

¹¹ Long Short Equity Hedge funds appear to have substantially out performed the Wilshire 5000 over the past 12 years. (See the Barclay Capital Long Short Equity Hedge Fund Index.) This is yet another argument for considering “alternative approaches” as well as alternative asset classes to investment management.

¹² Real Estate Investment Trusts, REITs, are included by Wilshire Associates in their determination of the market value of the Wilshire 5000. We have removed them from this section of both aggregate wealth and institutionally investable wealth and included their value in the commercial real estate segment. This reclassification has a very small impact as the total capitalization of the REIT universe at 12/31/2008 is \$.2 trillion.

¹³ Lehman Brothers, now Barclays Capital, reports the market value for the individual components of the Aggregate Bond Index on a daily basis. This number is reported on Bloomberg and is adjusted for both the issuance of new public debt and the change in value of old public debt.

¹⁴ In estimating of the total market value of debt securities, it is inappropriate to use the AGG exclusively because it makes various exclusions in order to track the bond market returns efficiently and is hence not a full accounting of all debt.

¹⁵ Using the aggregate bond index to estimate the value of bonds is not valid over long time periods due to the multiple changes in the inclusion rules for the various sectors of the aggregate bond index. Reclassification may cause a bond which was previously excluded from the index to be included in the

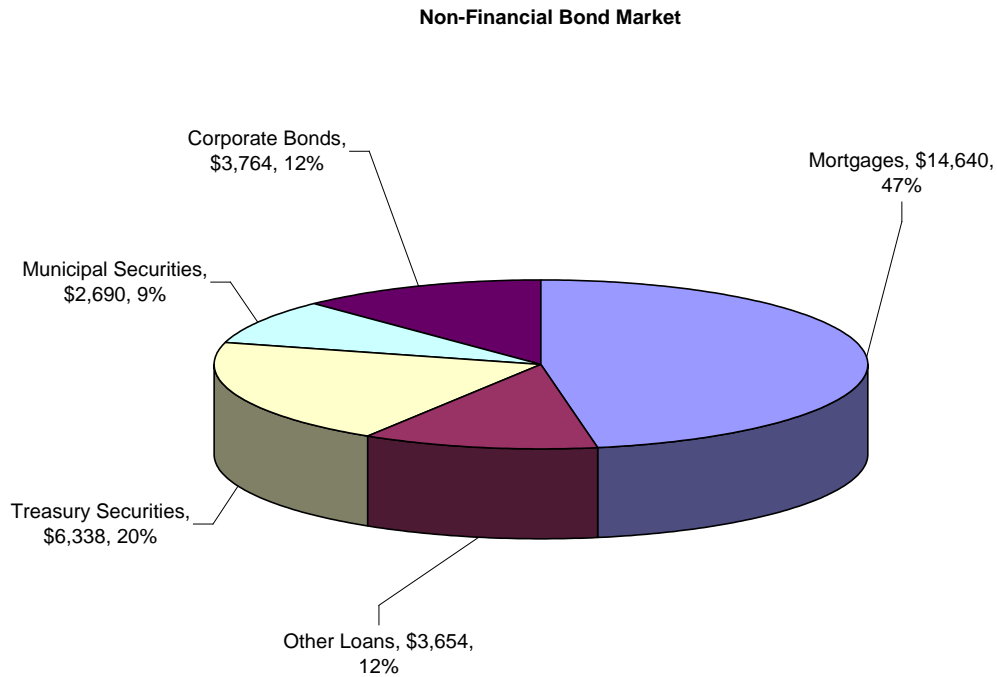
The Federal Reserve divides the bond market into two broad sectors, financial and non-financial. Only the non-financial sector is included here since the financial sector consists of banks and other financial institutions, which borrow money primarily to lend it out again. Counting the debt owned by as well as the debt owed to these financial institutions would be double counting. The non-financial sector is broken down into five types of instruments: treasury securities¹⁶, municipal securities, corporate bonds, mortgages, and other securities¹⁷.

index. This would increase the total market value of the index without a change in prices or new originations. Further, segment shifts such as the changing percentage of commercial real estate mortgages that are securitized create adjustment problems. For these reasons, the face value of bonds is presented up to 12/31/07. The quarterly values are then adjusted according to the value change of the aggregate bond index. In this manner, the impact of the current financial crisis is captured without incurring the adjustment problems inherent in trying to create a true market price of all bonds over the entire decade.

¹⁶ When thinking about debt securities, one naturally looks at the collateral behind the debt. This is in fact how the preceding section is segmented; mortgages, corporate debt, etc. In the case of treasury and municipal securities the obvious question is “where is the collateral”? Legally of course the bond holder’s claim is on the particular tax payer group. One might claim that the value of infrastructure, national and local, is the collateral. Interestingly, Prudential Research cited below shows a value of publicly owned commercial real estate of \$4.9 trillion at 12/31/08 not far from the sum of municipal and treasury bonds. Of course, there are considerable offsetting government liabilities such as social security and Medicare. Clearly the primary reason for trust in government debt securities is the tax payer’s ability to pay which rests on the huge amount of human capital in the country.

¹⁷ Other Instruments includes Commercial Paper, Agency and GSE backed Securities, Bank Loans Not Elsewhere Classified, and other loans and advances.

Figure 2



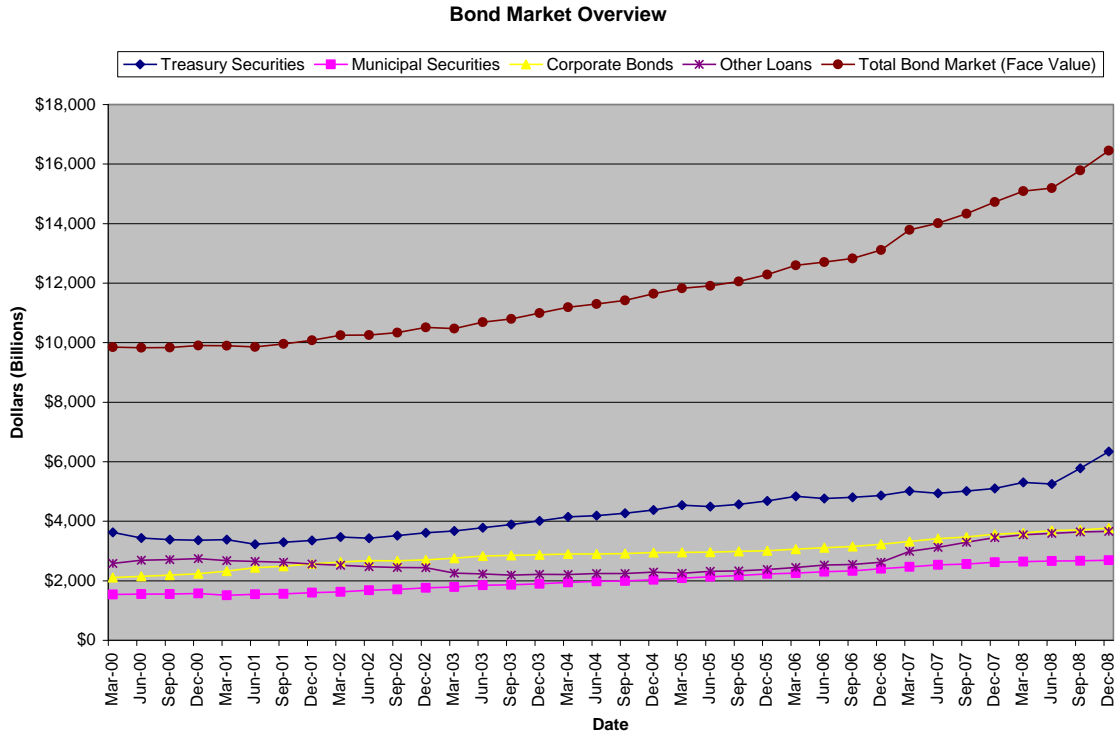
This chart displays the value, in billions, of the five bond segments as of the end of the 2008. These totals are the face value of each of the bond segments as reported by the Federal Reserve in its March 2009 release.

Mortgages are the largest component of the bond market, accounting for nearly half the face value of all non-financial debt. However, the value of a mortgage is closely tied to the value of the underlying property¹⁸. Therefore it is important to exclude the value of mortgages from the total value of aggregate wealth in order to avoid double counting. The face value of the bond market which contributes to aggregate US wealth is \$16.4 trillion as of the end of 2008.

¹⁸ The value of the mortgage on a home or building is usually less than the value of the real estate. In aggregate, this is true so that we capture the full value of the asset class with the market value of residential and commercial real estate as shown later in this paper.

The Figure below shows the change in the face value of the four components of the bond market, which contribute to aggregate wealth.

Figure 3

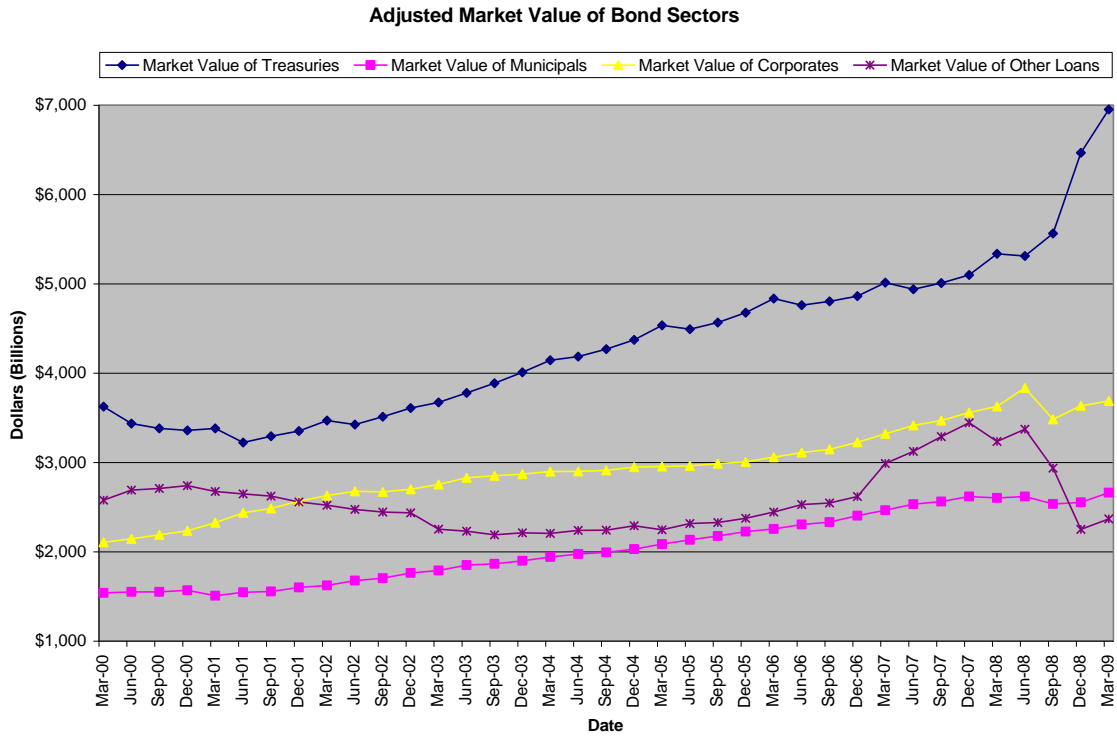


This Figure shows the total debt owed by non-financial sectors since 1985. The values represented here are the total face value of debt outstanding and do not represent what that debt could be traded for in the market place at the specified dates.

For each of the 5 most recent quarters the face value of each segment is adjusted using the corresponding components of the Aggregate Bond Index, Treasuries, Corporate Bonds, Municipals, and other¹⁹, in order to determine the aggregate wealth estimate as shown in Figure 4.

¹⁹ The other category is adjusted using the corporate high yield segment of the Aggregate Index.

Figure 4



This Figure displays the adjusted value (2008 forward only) of each of the four segments of the bond market, which contribute to aggregate wealth.

It is common, to use the market value of the components of the Aggregate Bond Index to determine a value for institutionally investable debt securities. We follow this practice but note that the AGG exclusions of debt maturing in less than one year²⁰ and variable rate debt produces a downward bias as institutional investors do hold such securities.

Most institutional investors do not purchase mortgages directly but invest in mortgage backed securities. An investor can divide real estate exposure between direct

²⁰ Cash is also excluded as inclusion would force consideration of all the issues which have caused the Federal Reserve to go to a double digit number of measures for the size of the money supply.

equity purchases of real estate and purchases of mortgage backed securities. Securitized mortgages are counted as part of the bond segment of institutionally investable wealth.

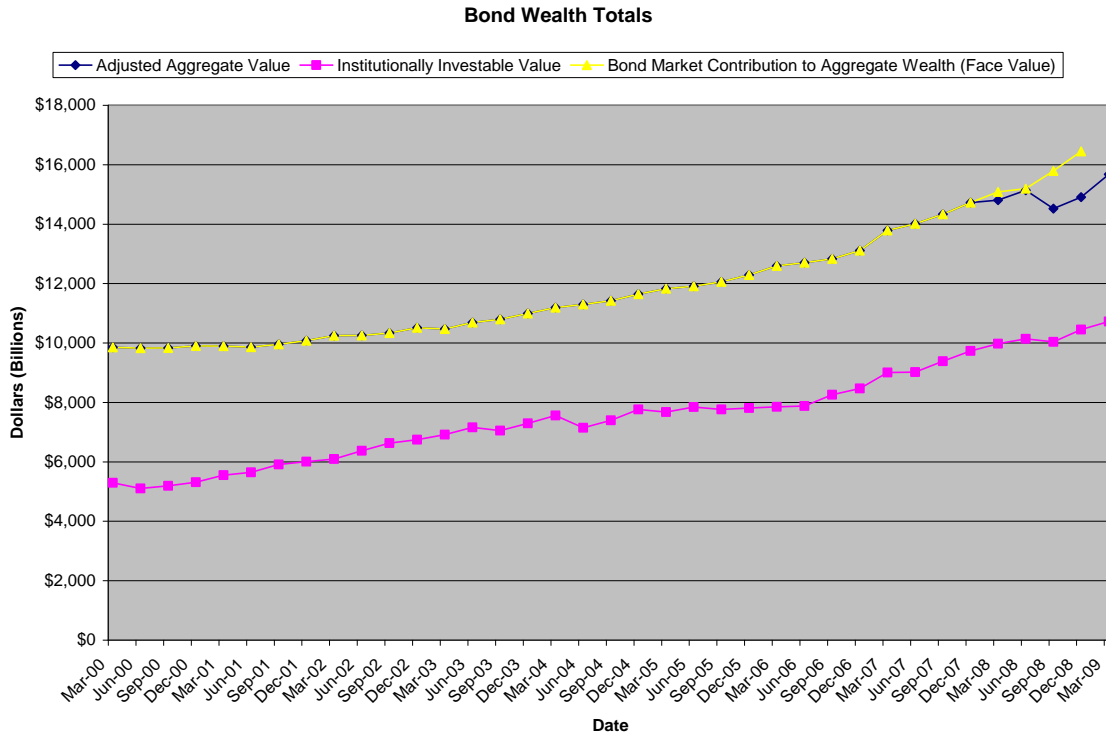
As can be seen in Figure 5, neither the aggregate value of all bonds nor the institutionally investable segment of bonds has experienced dramatic swings in aggregate size over the last several years. Despite the big price drops in some sectors of the bond market over the last few quarters, the aggregate value of bonds reached a peak value of \$15.7 trillion in the first quarter of 2009. This initially counter intuitive figure is actually quite logical. The increased value of treasury debt, caused by a price increase of older securities and heavy new issues, has more than offset the decrease in value of other types of debt, most notably corporate high yield debt.

The market value of all debt is approximately \$1 trillion below its face value at March 31, 2009. Treasury securities, the only debt security trading above face value, are valued 10% above face value. With spread widening offsetting lower risk free rates, municipal, corporate and other debt securities are valued 1%, 2%, and 35% below face value respectively²¹. The institutionally investable portion of bonds, including securitized mortgages, is currently at its peak value of \$10.7 trillion²².

²¹ Other debt has a 12/31/2008 face value of \$3.7 trillion while the face value of treasuries is \$6.3 trillion. The 35% reduction in value of other debt more than compensates for the 10% increase in value of treasuries explaining why debt is valued \$1 trillion below face value.

²² Institutionally investable bonds consist of treasuries, municipals, corporate, corporate high yield, and securitized mortgage debt. Only the values reported in the AGG, not the face values reported by the Federal Reserve, were used to determine this value.

Figure 5



This Figure displays the adjusted aggregate and institutionally investable wealth totals for the bond sector.

Non-Securitized Equity

The value of the non-securitized equity segment of US wealth is considerably more difficult to determine than the value of stocks or bonds. Interestingly research by government documents librarians indicates that there is no study available from any agency of the federal government estimating the market value of the more than thirty million corporations, partnerships, and sole proprietorships in the US.²³ While a precise determination of the value of all private businesses is well beyond the scope of this paper, it is possible to make reasonable estimates by combining equity performance data from the Wilshire 5000 with IRS tax data. As the footnotes detail, estimates here are much

²³ University of North Carolina Government Documents Librarians

“rougher”. Still, even an order of magnitude estimate is more insightful than either ignoring the investment opportunity or failing to consider the relative size of this component of the investment universe.

Using IRS tax records on the net income of all US businesses²⁴ and the corresponding price to earnings ratio of the Wilshire 5000²⁵, it is possible to estimate the market value of all US businesses for each year from 2000 through 2007²⁶ (the most recent tax data available). That value is then updated to 3/31/2009 using the value change of the Wilshire²⁷. Hence the market value of all US businesses is a function of the after tax income for all corporations and partnerships²⁸ and the P/E ratio of the Wilshire 5000.²⁹

A single P/E multiple is used for all corporations and partnerships. Clearly, using the same PE ratio for all companies is suspect; however, there is no easy way to know either the relative riskiness or the growth potential of listed vs. unlisted companies. The Wilshire 5000 accounts for less than 0.1% of all businesses by number but a high

²⁴ The sum of net incomes for all U.S. businesses was \$2 trillion for the year end 2007 (corporations \$1.6T and partnerships \$.4T, business sole proprietorships not included). The after tax income for all businesses was estimated from summary tax information for 2006 and 2007. For previous years the after tax income is determined directly from the IRS income statements. Only ordinary business income is used. Obviously tax reported income is not synonymous with GAAP income but the differences become more modest with a very large number of companies over an extended period of time.

²⁵ Historical values of the P/E ratio for the Wilshire 5000 were provided by Wilshire Associates. The current P/E ratio is available on the Wilshire Associates web site.

²⁶ The largest single year increase in net income came in 2005 when corporations were allowed to repatriate 85% of foreign held cash (representing foreign income) tax free. During this time the net income of all corporations nearly doubled. Because it was a one time allowance, the appropriate amount of “special” income was removed for 2005. Certainly not all corporations would have repatriated foreign capital in 2005. Federal laws allowed for repatriation between Oct 2004 and Oct 2006. No detailed income statement numbers are available for 2006, thus no deductions were made for that year assuming that corporations moved expeditiously to take advantage of the program.

²⁷ An estimate is necessary here because 2008 tax data will not become available until the end of 2009 at the earliest.

²⁸ It is now common for limited liability corporations to choose to be taxed as a partnership when such taxation is favorable to the owners of the business. When such an election is made, the corporation will appear as a partnership in the IRS files.

²⁹ Sole proprietorships are assumed to be the primary income source of the owner and thus “salary like”. Therefore, no value from sole proprietorships is included in these estimates.

percentage by assets. While many of the smaller unlisted businesses have limited growth potential, somewhere in the over 12 million unlisted US businesses there hopefully exists the next Microsoft or Google. Further not all unlisted companies are small. Cargill (the largest unlisted company) had a great year in 2008 while the same cannot be said for most of the Wilshire 5000. Wilshire Associates does provide P/E ratios for smaller “Wilshire like” indices but even the companies which constitute the smallest of these indices, the micro cap index, have a relatively large amount of assets when compared to the total composition of US businesses. In addition, this sample is less representative of all businesses and might skew the results of these estimates because of varying industry concentrations. The P/E of the entire Wilshire 5000 is used because that index is the most representative sample of all US businesses. With this methodology, the market value of all US businesses peaked at \$39.5 trillion in 2007 and has dropped to \$20.6 trillion by the end of the first quarter of 2009, a 48% drop.

As a rough check on this methodology, the price to book ratio of all companies is calculated and compared to the P/B ratio of the Wilshire 5000 using the market value as calculated above for the price. The book value was taken from the Federal Reserve Flow of Funds data which reports the net worth of all businesses³⁰. The P/B ratio estimate for all businesses is 0.96 as of the year end 2008. This seems a reasonable estimate for all companies because securitized equity showed a P/B ratio of 1.27 and the Wilshire 4500³¹ showed a P/B value of 1.06 for the same time period.

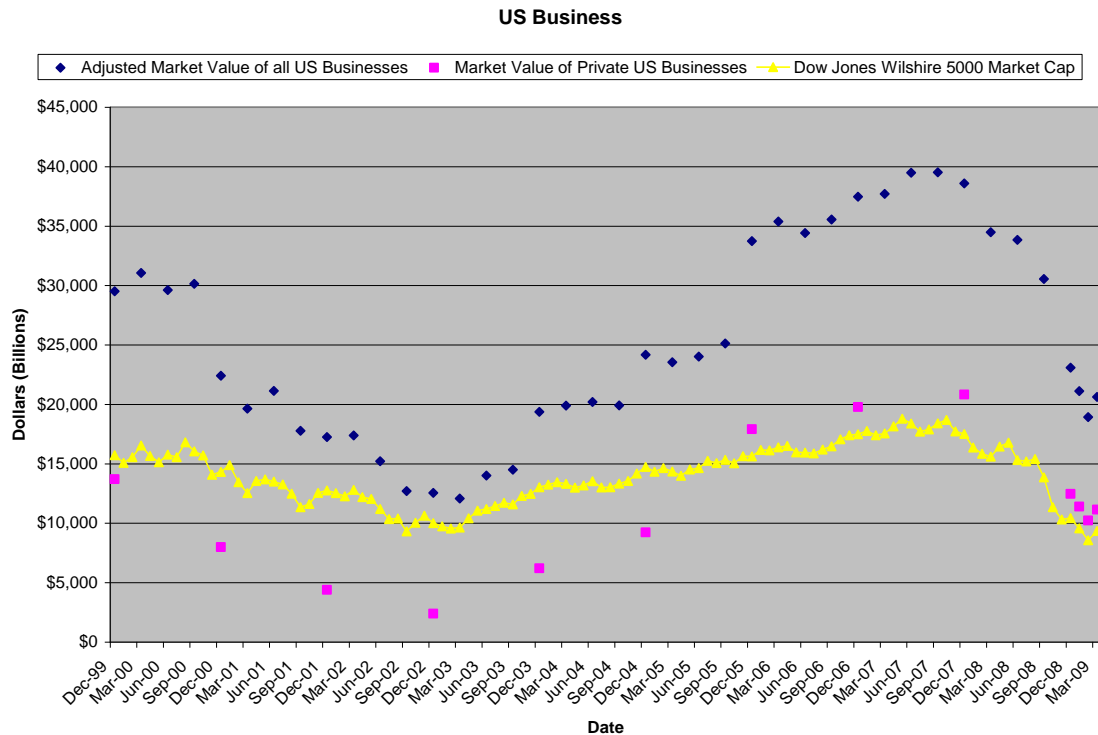
³⁰ This book value does not include the net worth of financial companies. That value is not reported by the Federal Reserve.

³¹ The Wilshire 4500 consists of all publicly traded stocks which are not included in the S&P 500. As a result, the stocks in this index are small and mid cap. A P/B of the 4500 between our estimate of all businesses and the S&P 500 seems appropriate.

The value of all non securitized equity is approximated by subtracting the market value of the Wilshire 5000 from the total value of all US businesses. From the end of 2007 to the end of 2008 this estimate of all non securitized equity in the US dropped 40% from \$20.8 trillion to \$12.5 trillion, a smaller percentage decrease than public equities. During 2009 non securitized equities continued their downward trend reaching a low of \$10.2 trillion on March 9. The value was \$11.1 trillion as of the end of the first quarter.

In peak economic years (2000 and 2006), the market value of the Wilshire 5000 can account for more than half of the total market value of all US businesses; while in down years (2002 and 2008), it can account for more than 80%. The reason for this may be two fold. First, during tough times larger companies can squeeze smaller companies to stabilize their own earnings. Second, larger companies have access to technology enabled global outsourcing which allows them to adjust more easily than their smaller counterparts to secular trends. In contrast, during peak expansion years larger companies find rapid reaction to the market easier with domestic outsourcing and feed the more rapid growth of smaller firms.

Figure 6



This Figure compares the adjusted value of all US businesses since the year end 1999³² to the market value of the Wilshire 5000.

Institutions access this asset class primarily through private equity firms and the total assets of funds managed by such firms have grown rapidly over the last two decades³³. Private equity commitments have risen from \$16 billion in 1989 to over \$300 billion in 2007. New commitments dropped considerably in 2008 to just over \$200 billion.

Coverage of this asset class may actually be much larger than initially suggested by the aggregate size of all private equity funds. Buyout and mezzanine funds represent approximately 75% of private equity commitments. Since heavy leverage is typically

³² The year end values are determined by multiplying the net income by the P/E ratio of the Wilshire 5000 for the corresponding year. The monthly values are estimated by multiplying the market value of all companies by the percent change in the market value of the Wilshire 5000.

³³ See David Swenson, *Pioneering Portfolio Management*, for supporting arguments.

employed in such funds, investors “cover” much more of the investment universe than suggested by fund size alone. Still, as a percentage of the entire non-securitized equity asset class, the collective value of all private equity funds is comparatively small.

The takedown levels for private equity funds are used to estimate institutionally investable non securitized equity. Since private equity investments have long lifetimes, approximately 12 years, a 48 quarter rolling sum is used for the estimate. Institutionally investable non securitized equity reached a peak of \$0.6 trillion in the fourth quarter of 2008³⁴. This total represents less than 3% of the institutionally investable universe.

Figure 7 shows institutionally investable total returns of both non securitized equity and public equity since the first quarter of 1984. The movement of the two asset classes appears to be highly correlated³⁵, but this is a much debated conclusion. While private equity (in aggregate, as reported) has a higher return, many argue that there is no “free lunch” and that private equity is inherently riskier than public equity³⁶. The debate centers on the appropriate levels of risk for private equity investment, since stale pricing can reduce the standard deviation of private equity returns³⁷. Regardless of the relative “attractiveness”, non securitized equity is underweighted in the average institutional portfolio from a naive diversification perspective.

³⁴ All private equity data acquired from Thomson Reuters. Because of the significant increase in private equity investments over the past decade this rolling sum does not yet reflect the downturn in private equity investment.

³⁵ In order to be as accurate as possible both sets of returns are calculated quarterly. This will remove much of the volatility of the public equity market but allows for a consistent comparison between the two asset classes, as private equity returns are not available on a daily basis.

³⁶ Non-synchronous trading has been shown to overstate risk adjusted returns on private equity investments. Actual private equity returns may not be as attractive as those presented.

³⁷ By simply using the values in figure seven one arrives at a standard deviation of 6.46% for private equity and 8.13% for the Wilshire 5000.

Figure 7

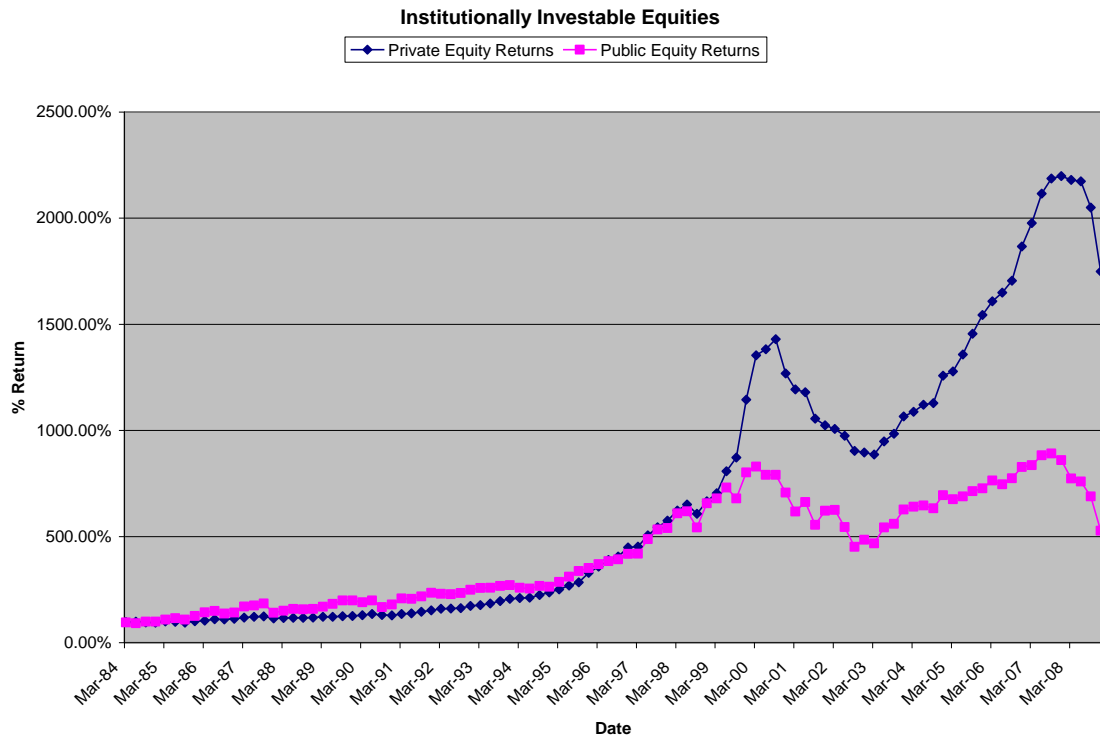


Figure 7: This graph displays the total return in public equity and private equity investments from the first quarter of 1984 to the end of the fourth quarter of 2008. The correlation between these two markets illustrates why investors are unwilling to expose their portfolios to the additional risk of private equity assets.

Residential Housing

The decennial census provides the most complete description of the value of residential homes. The 2000 Census establishes a base value of \$9.7 trillion³⁸ for the 69 million owner occupied homes in the US at the beginning of 2000³⁹. The mean value of these homes was approximately \$140,837. In 2000 there were a total of 18,426,000 renter occupied homes and 9,489,000 vacant homes bringing the total number of single family homes to 96,711,000. The total value of owner occupied, renter occupied and vacant

³⁸ Source: http://www.macromarkets.com/csi_housing/documents/census.pdf

³⁹ Source: 2000 US Census Introductory Housing Statistics. This number includes single units detached, single units attached and 2-4 units. Larger apartment complexes are accounted for in commercial real estate values.

homes was \$13.2 trillion at that time.⁴⁰ This number is higher than many published numbers but appropriate for this work because it includes the value of renter occupied and vacant homes which are clearly part of the nation's wealth.

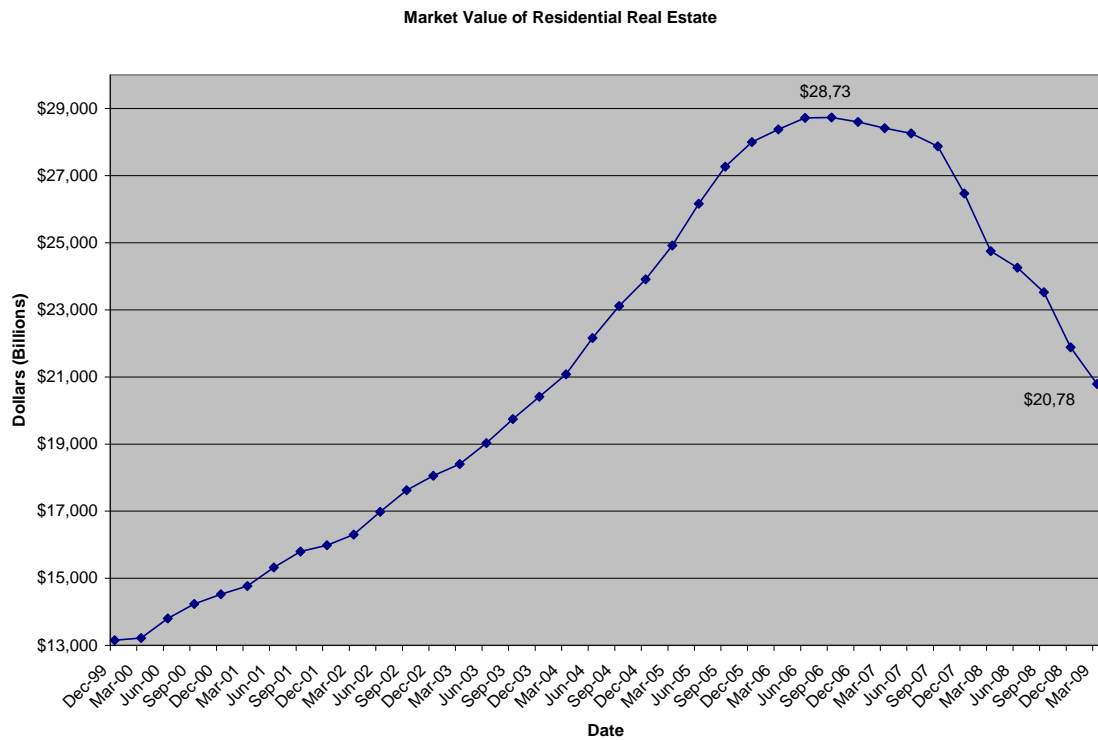
To update the residential housing market from its 2000 market value we use the Case-Shiller Index. The S&P/Case-Shiller US National Home Price Index uses repeat sales methodology to determine change in value of the various sectors of the residential housing market. For our purposes, the US National Index is preferred to the more commonly cited benchmark, the Home Price Composite 10 Index, because the national index encompasses a larger share (approximately 70%) of the US housing market⁴¹. We estimate the value of homes since 2000 using the US national index to determine the appreciation of existing homes and then add the value of new residential construction put in place⁴².

⁴⁰ This initial market value is determined by multiplying the mean value of owner occupied homes by the total number of owned, vacant and renter occupied homes. This value will overestimate the total value of residential real estate to the extent that renter occupied homes are on average less valuable.

⁴¹ Source: http://www.macromarkets.com/csi_housing/documents/census.pdf

⁴² This value also includes major renovations done to residential structures which would not be included in the Case Shiller repeat sales methodology.

Figure 8



This Figure displays the market value of single family homes since 2000. Quarterly values are determined from the US National Index and the American Housing Survey. Monthly values are estimated from the percent change in the Composite 20 Home Price Index.

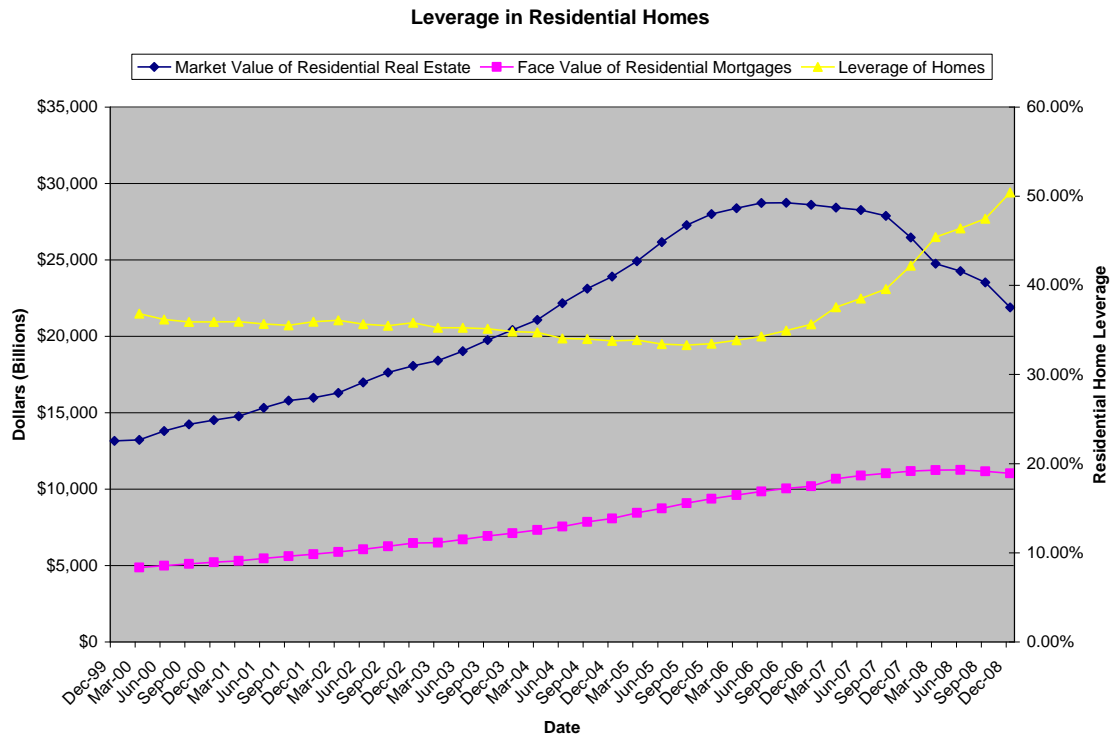
The market value of single family homes peaked in May of 2006 at \$28.7 trillion. Since then the market value of single family homes decreased 28%, to \$20.8 trillion⁴³. The peak value of residential real estate came more than a year before the peak in aggregate wealth occurred. As can be seen in Figure 8, the decline in value of residential real estate was small at first dropping by approximately \$1 trillion from May 2006 to August 2007. The substantial drops in value began in the third quarter of 2007.

It is instructive to look at the value of homes relative to the residential mortgage totals (Figure 9). At peak home prices, the average leverage of all home owners (including renter and vacant family homes) was just under 35%. That number has

⁴³ The Case Shiller Index reports values 2 months late. To obtain the March 2009 estimate we used the 2009 mean 2009 forecast from Global Insight.

increased rather dramatically with the drop in home prices to 50% as of the end of 2008.⁴⁴

Figure 9



This Figure compares the total market value of single family homes to the face value of all residential mortgages. The percent leverage of all homes is seen in the right Y axis.

While, residential real estate contributes nothing directly to institutionally investable wealth⁴⁵, asset backed securities built from home loans contribute materially to institutionally investable wealth⁴⁶. The rise in direct leverage on homes obviously increases the risk of mortgage backed securities and, all else equal, causes a drop in

⁴⁴ Leverage will increase further when the Federal Reserve reports 3/31/2009 face values late in the second quarter given the continuing drop in house prices.

⁴⁵ Second homes can be purchased for investment but the primary means of investment in residential real estate is through mortgage backed securities.

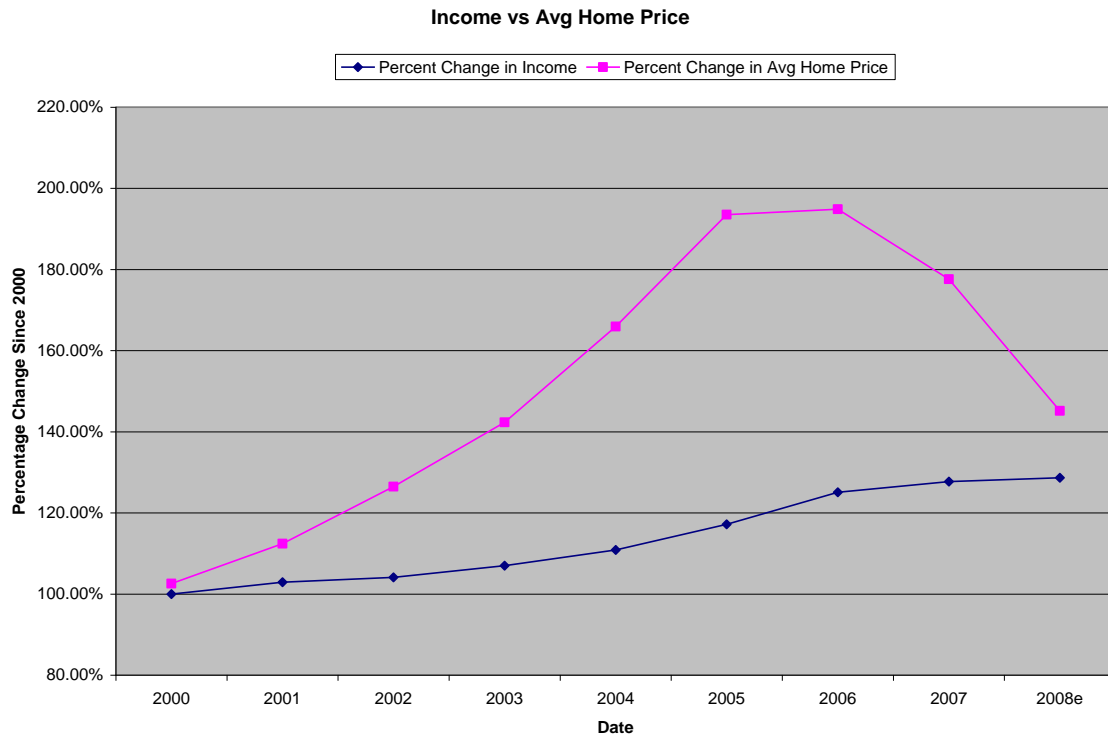
⁴⁶ The value of such securities is included in the bond section of this research.

value⁴⁷. However, as seen in the debt securities segment, new originations outpaced this drop in value until the third quarter of 2007. Further, government backed mortgage pools, insulated from the risk of greater leverage, increased in value with the decline in the risk free rate.

Figure 10 illustrates the current political problem from a different perspective. The value of the average home was clearly rising faster than home owner income for many years through the peak value of homes in 2006. Further, the differences vary substantially by “vintage year”. Clearly this was an unsustainable situation whose nature will make it difficult for any “housing recovery plan” to: 1) solve all the related financial problems, and 2) satisfy all the varied groups with a vested interest.

⁴⁷ The increase in leverage results in many cases where the mortgage of an individual home exceeds the value of the home. From a public policy perspective, the mid February release of the Administration’s plan to deal with the housing crisis is a major effort to keep prices from declining further.

Figure 10



This Figure illustrates the difference between the change in home prices and the change in household income. As is obvious from the Figure the average price of homes was increasing faster than the collective income of individuals in the US.

Commercial Real Estate

The approach to estimating the value of commercial real estate is similar to that of residential real estate but begins from a different starting point. Prudential determined the value of all non-government commercial real estate (including apartments) to be \$7.4 trillion at the end of 2001⁴⁸. Their methodology uses earlier work as a base then a combination of the NCREIF Index and new construction put in place. The NCREIF index experienced a 44% increase from the fourth quarter of 2001 value to a peak value

⁴⁸ Source: Prudential Real Estate Research. Prudential began with an estimate of all real estate for 2001 as determined in "Sizing up the US Real Estate Investment Market" January 2003. An unpublished working paper in February 2009 updates this work. Note that the value of residential and government real estate was removed from the total of all real estate to leave only private commercial real estate. The total for commercial real estate includes agricultural and timberland.

in the first quarter of 2008⁴⁹. The appreciation of commercial real estate since 2001 in combination with the addition of new construction, results in a peak market value of \$11.6 trillion⁵⁰ as shown in Figure 11.

Figure 11



This Figure shows the change in value of all commercial real estate since the end of 2001. Each quarter of 2008 has been adjusted according to both the Prudential Real Estate and the Guggenheim Partners methodologies.

Two problems exist with using the NCREIF Index (NPI) in a current estimation of the value of commercial real estate. Both involve appraisal lag. In active markets, the NPI lags market pricing by two to three quarters given the need to gather comparable rents and sales, do the calculations, and review the conclusions at multiple levels. In less active markets, this mechanical/accounting lag is elongated. When working with long

⁴⁹ Source: www.ncreif.com

⁵⁰ Our estimate is in line with Prudential’s estimate before we correct for NCREIF lag

time periods, this problem can be largely ignored as actual sales prices eventually enter the calculations. However, recent economic instability has exacerbated the issue when using the index to determine how much wealth has changed over the last several quarters. Consequently, an adjustment is made similar to the ones made in the bond market but with different reference points appropriate for this sector.

The NCREIF index eventually picks up on both fundamental changes (changes in expected operating income of properties) as well as changes in the pricing of the associated expected cash flows. At this point in the economic cycle, both are deteriorating and both are difficult to measure given the scarcity of transactions. This has led to numerous rather dire estimations. For example Moody's predicted a 20-30% drop in the value of commercial real estate from its peak value in 2007, and the two year NCREIF derivative was trading at -9% (mid point of a rather inactive market at 12/31/08) which corresponds to a drop of 28% in the value of commercial real estate. Both of these predictions imply that the NCREIF index is still lagging by a rather large amount even after the fourth quarter drop in capital values of more than 9% and a first quarter 2009 drop of an additional 6%.

To capture the current situation as closely as possible, we use the Guggenheim Real Estate⁵¹ analytical framework. This involves first seeing how far the values as reported by NCREIF over the last five years ran ahead of fundamentals. This is similar to looking at how much faster home prices grew over the same period than household income. From this work, there was an apparent "pricing beyond fundamentals" of nearly 11% at 9/30/2008. In the fourth quarter of 2008, the drop in prices reported by NCREIF moved the 5 year appreciation roughly in line with the change in fundamentals over that

⁵¹ Source: Guggenheim Real Estate Partners. See www.guggenheimrealestate.com.

same 5 year period. Since the liquidity problems that have put all appraisals in question began in the fourth quarter of 2007, we spread the 11% value change over those four quarters resulting in a 2.75% per quarter drop starting with the fourth quarter of 2007.

Next, the forward forecast of NCREIF returns over the next three years is compared to the 30 year average to see how much values at 12/31/08 have to fall to get prospective returns up to the long term average on a real return basis. For 2009-2011, “forecast” fundamentals suggest that real returns will be nearly 12% below the 30 year average implying a needed price drop of 12% if current buyers are to obtain “normal” returns. Looking at public market pricing (the real estate investment trusts), it is clear that the major decline in commercial real estate prices hit in the fourth quarter of 2008 so we use the second portion of the Guggenheim methodology (forecast returns compared to long term average) to change only the 12/31/08 and 3/31/2009 estimates derived using the Prudential methodology⁵². This brings the current value of commercial real estate to \$9.5 trillion which represents a drop of 25% in the value of commercial real estate in the US from the peak in the fourth quarter of 2007.

How much of this sector’s aggregate is institutionally investible is a challenging question. Prudential shows 13% of the aggregate as institutional investment at the end of 2007. Of course part of this is in the form of REITs (remember the market value of REITs was subtracted from the Wilshire 5000 so that it could be included here).

Prudential suggests that 64% of the aggregate institutional investment is in “core”

⁵² The three year forward average return from fundamentals (January Guggenheim most likely forecast) is 3.8% at 12/31/08. The long term average real return is 5.9%. Therefore, 5.9% + expected inflation (as currently priced by the TIP vs. 10 year comparison) of 0.9% less the 3.8% shows a need for 3% more prospective return each year for the next three years. We therefore, reduce the estimated value of commercial real estate at 12/31/08 by 9%. The first quarter 2009 drop in NCREIF of 6% is considered to still lag the market by 3%.

properties which correspond to the NCREIF index. Institutions can also access this asset classes through private equity vehicles. In such cases the investments are often non core and substantially leveraged (an issue we consider in the final section).

From a practical perspective, institutional investors could have their investment managers make acquisitions in most of the commercial real estate universe. However, the cost for acquiring and managing smaller properties in smaller cities is quite significant. To maintain consistency across sources, the Prudential Real Estate estimate of current institutional holdings (13%) is used as the institutionally available portion of this asset class. Clearly this is a bias on the low side, but consistent with current practice.

Other Wealth

The residual category is composed of many smaller assets, most notably automobiles. As of 2006 there were a total of 241,210,867 registered passenger vehicles on the road⁵³. This number includes cars, pickup trucks, minivans and motorcycles. The average price of all passenger vehicles sold, both new and used, was \$13,827⁵⁴. In addition to automobiles, this category is intended to contain all other tangible goods, furniture, jewelry, etc. There is no good measure of the market value of these other items. As a proxy, we use the value of consumer credit card debt, \$2.4 trillion as of the fourth quarter of 2006⁵⁵ since it ties nicely to bond values and is thus useful in producing an investible wealth component. This brings the total for all other sources of wealth to \$5.7 trillion as of the year end 2006. The recent drop in the value of consumer credit has

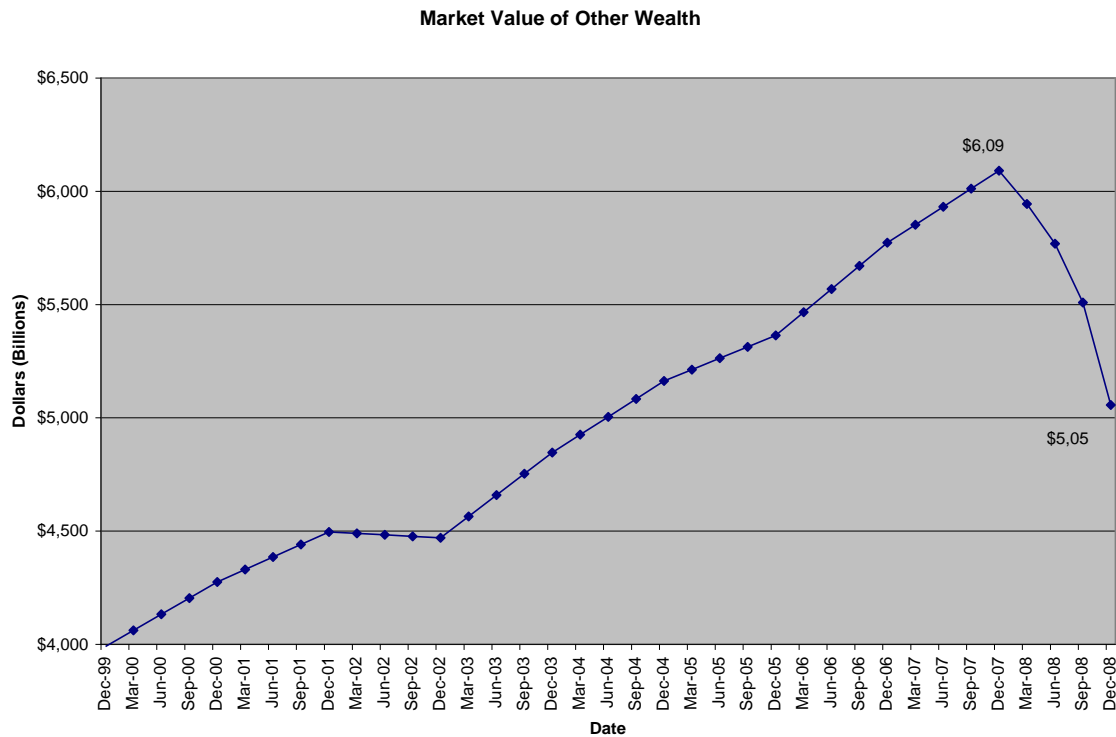
⁵³ Source: Bureau of Transportation Statistics “2008 National Transportation Statistics” report.

⁵⁴ Source: Bureau of Transportation Statistics “2008 National Transportation Statistics” report. Simple multiplication brings the 2006 total for all passenger vehicles to \$3.3 trillion.

⁵⁵ Source: Federal Flow of Funds Report.

dropped other wealth from a peak value in the fourth quarter of 2007 of \$6 trillion to a value of \$5.0 trillion⁵⁶.

Figure 12



This Figure displays the market value of the Other Wealth component of the aggregate wealth of the US. It consists of two categories, automobiles and consumer credit card debt. A linear approximation of growth was used to obtain data points for 2006, 2007, and 2008.

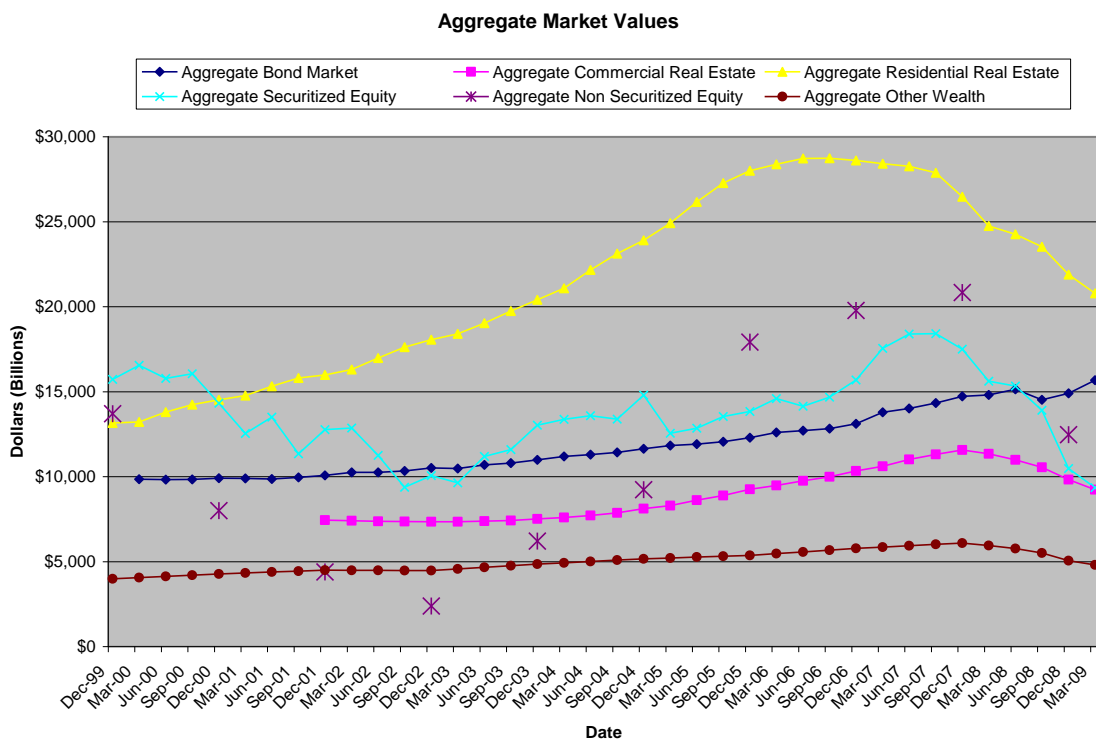
The institutionally investible portion of this wealth is through related asset backed securities as reported quarterly in the federal flow of funds. The value of all asset backed securities comprised of consumer credit and auto loans is contained within the debt securities section.

⁵⁶ The values for automobiles are only available for years up to 2006. In order to obtain more recent values a linear approximation was used. During the economic downturn which happened from 2000 to 2003, other wealth continued to increase by a nearly linear amount. We therefore believe that the current economic crisis has not yet had a dramatic effect on the value of automobiles. All consumer credit information was obtained from the Federal Reserve Flow of Funds.

Aggregate National Wealth and Institutionally Investable Wealth

The aggregate value of US wealth is determined by summing the values of the six segments above⁵⁷. The value of institutionally investable wealth is calculated in the same manner with the adjustments noted in preceding sections. The break down of the overall market is shown in Figure 13.

Figure 13



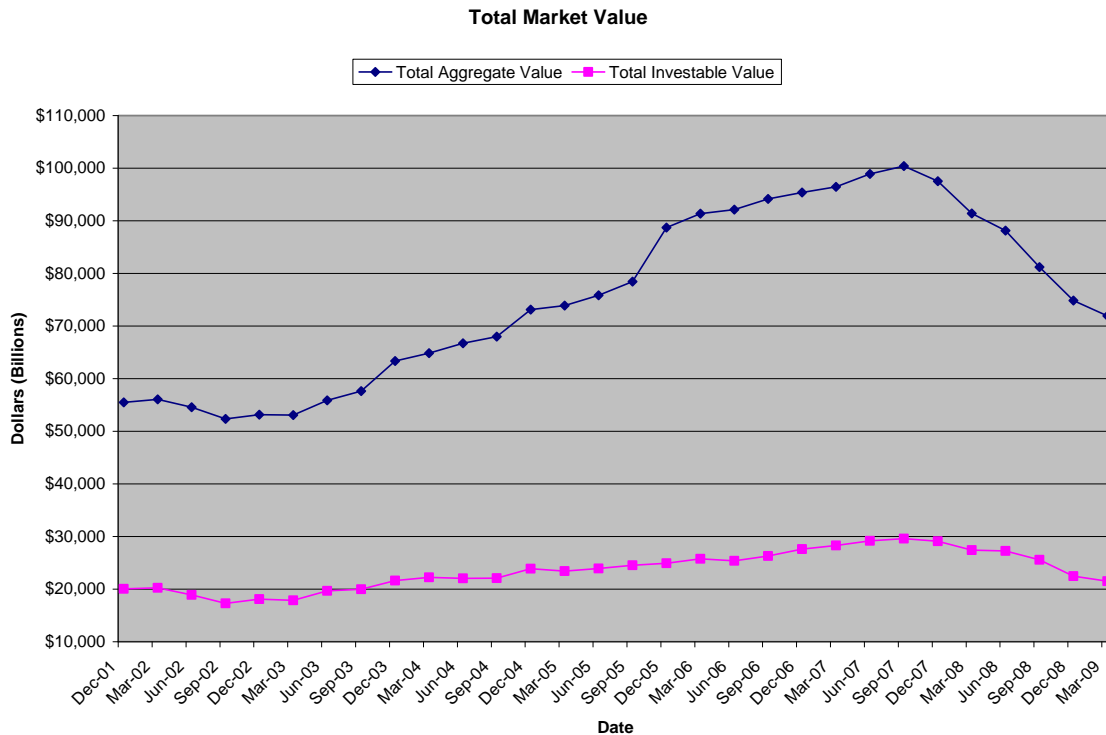
This is a summary of the six segments which contribute to the aggregate wealth of the US. The market value of Non-Securitized Equity is only estimated at year end.

As shown in Figure 14, aggregate US wealth peaked in the third quarter of 2007 at \$100.4 trillion. Since that peak, aggregate wealth has dropped by \$28.5 trillion to \$71.9 trillion, a 29 % drop in six quarters. Institutionally investable wealth does not include much of three large and volatile segments of aggregate wealth: non securitized equity,

⁵⁷ Recall that most double counting has been eliminated to arrive at each segment's aggregate value.

commercial real estate, and residential housing⁵⁸, but undergoes a similar drop in size. Institutionally investable wealth reached its peak in the third quarter of 2007 at a value of \$29.6 trillion. Since that peak, institutionally investable wealth has dropped by \$8.1 trillion to \$21.5 trillion, a 27% drop.

Figure 14



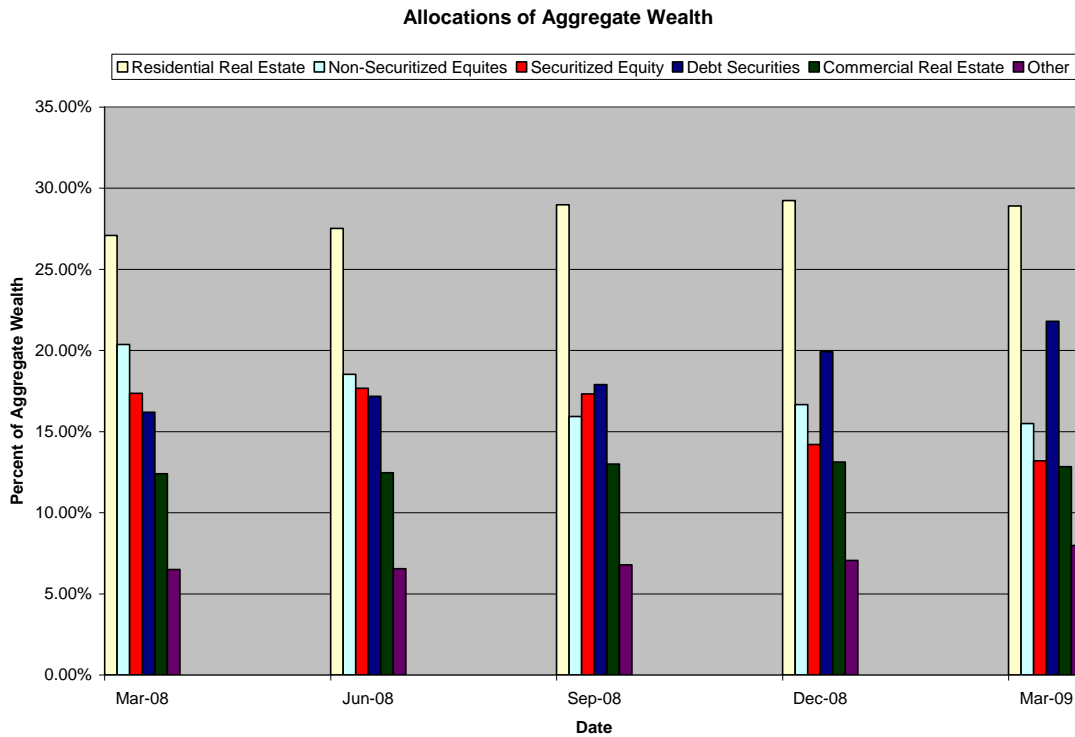
The value of Aggregate Wealth and Institutionally Investable Wealth since the year end 2001

Differing declines in the six segments of wealth have shifted composition of the naively diversified portfolio. Residential real estate has remained between 25-30% of the aggregate wealth for the past two years, and is still the largest segment despite the drop in value of homes. Residential real estate has dropped from 29% of aggregate wealth at its peak to 27% currently. The largest drop has occurred in the public and non-securitized equity portions of the market. Public equity has dropped from 19% of aggregate wealth to

⁵⁸ It is possible for an investor to purchase a second home or a local bar for investment purposes but the value of such transactions is negligible when rounding to tenths of a trillion dollars.

13% while non-securitized equity has dropped from 21% to 16% of aggregate wealth. Commercial real estate and debt securities have increased on a percentage basis over the past two years: Commercial real estate from 11% to 13%, and debt from 14% to 22%.

Figure 15

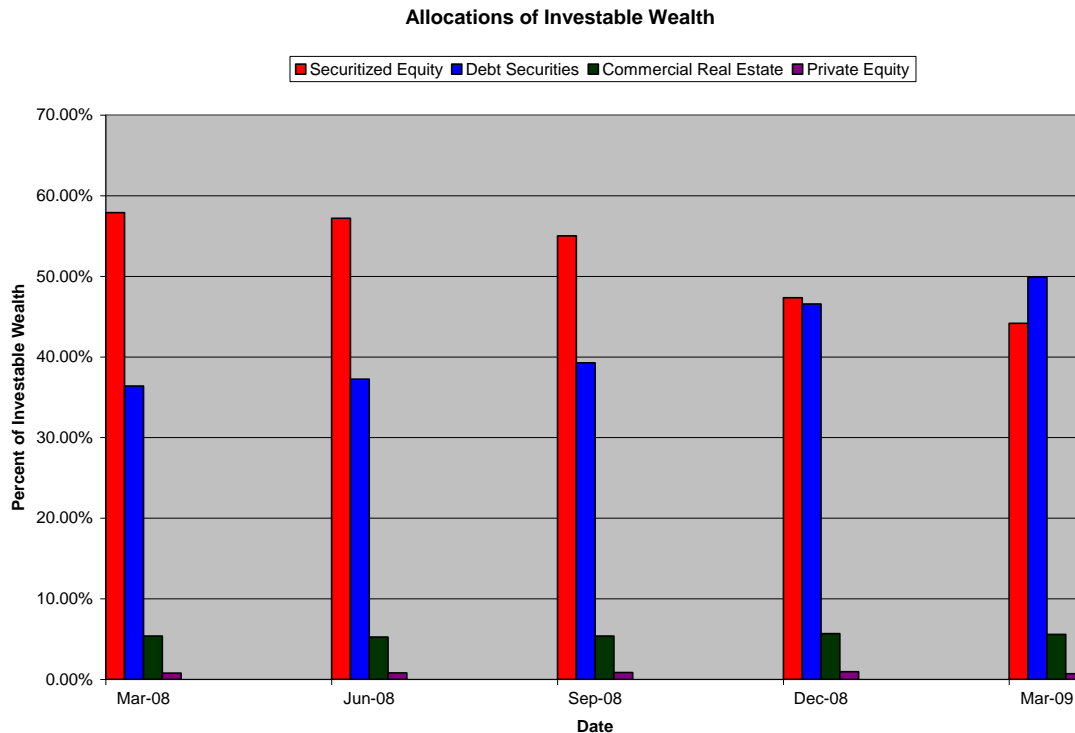


Institutionally Investable wealth has undergone similar but larger changes.

Securitized equity was the largest segment investable wealth until the last quarter of 2007. Since 2007 securitized equity has dropped from 63% of institutionally investable wealth to 44%. Bonds have become a much larger portion of investable wealth moving from 32% to 50% at the end of the first quarter of 2009. Commercial real estate and other investable wealth account for 6% and less than 1%⁵⁹, respectively and have changed by less than 1 % each.

⁵⁹ All percentages have been rounded off.

Figure 16



Implications for Portfolio Construction

A portfolio allocation 60% to equities and 40% to debt, with both exposures gained solely from the public markets, was not considered unduly cautious twenty years ago. More recently, there has been much talk of an expanded universe with large academic foundations leading the way.⁶⁰ Using Ibbotson data on the long history of publicly traded instruments as well as various proxies for the less liquid “asset classes”, financial consultants have helped large investors tailor an appropriate portfolio.

⁶⁰ For example, see David Swenson’s *Pioneering Portfolio Management*, 2000. His arguments became ever more persuasive as results over the last decade cast more doubt on the advisability of accepting the 10% nominal, 7% real return assumptions for indexed equity implied by the longer term Ibbotson data. The jury is still out on how the financial crisis may “adjust” his logic.

As institutional investors approached the “alternatives markets”,⁶¹ the available vehicles were often levered both at the fund level and at the individual transaction level. This provided a “heavy steroid” set of investment alternatives as the leverage allowed a relatively few dollars from the institutional investor to control a much larger (5 to 10 times) bundle of assets. This was not totally inappropriate. As a comparison of figures 14 and 15 demonstrates, institutional investors are still significantly underweight to alternatives compared to naïve diversification based on aggregate wealth. Consequently, gaining more exposure through the use of leverage shifted the “effective” portfolio exposures rapidly in the right direction. On the other hand, in today’s difficult markets such levered investments produce very large losses relative to the “reported” size of the allocations to those asset classes.

With the drop in the value of securitized and non-securitized equity, bonds have become a greater percentage of the total wealth of the US. Bonds account for nearly a quarter of all wealth in the country and half of all institutionally investable wealth⁶². This is in spite of the downward bias which occurs in our estimation of the market value of institutional investible bonds.

Summary

The questions of when (if ever) to a) rebalance a portfolio and/or b) move into “alternatives” should be viewed acknowledging both the recent inability of securitized equities to deliver a positive real return and the continued underweight to alternative asset classes. Regardless of the objectives of the particular investor or the financial technology

⁶¹ As noted earlier, there are both alternative asset classes (un-securitized equity and commercial real estate) as well as alternative ways to approach the traditional markets (e.g. a long-short hedge fund approach to traditional securitized equity).

⁶² If “deleveraging” continues to be the watchword of corporate and entrepreneurial America, the percentage debt in both the aggregate and institutionally investible universes should decrease.

used in portfolio optimization, the large changes in relative aggregate values enumerated above warrant careful consideration. It is probably still true that most investors are underweight non securitized equity and to a lesser degree commercial real estate. However, the severe downturn has highlighted significant problems with many of the vehicles available to investors seeking exposure to these asset classes.

This background is of course just a starting point. Today most investors view everything from a global perspective. Even domestically, changes in accounting and reporting rules are also a potentially significant part of the picture. With the implementation of FAS 157 in 2009, as yet unrecognized losses could be substantial particularly in the highly levered alternative asset classes.