



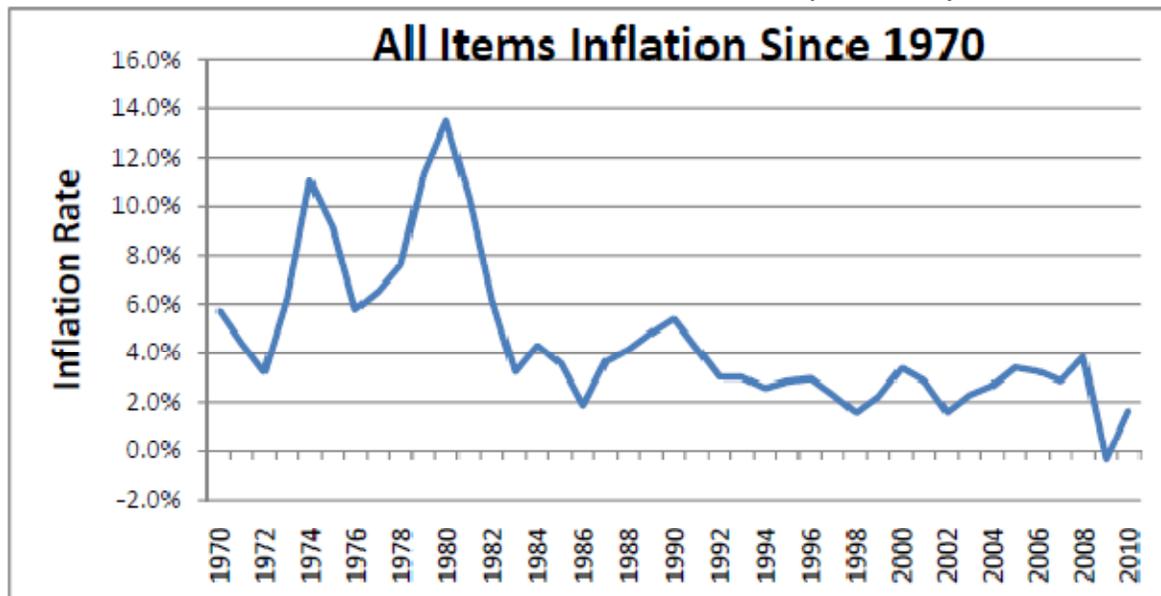
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## Investment Newsletter – June 2011

This quarter we begin a series on risks to retirement with a look at the effects of inflation and how it interacts with investment strategy in retirement.

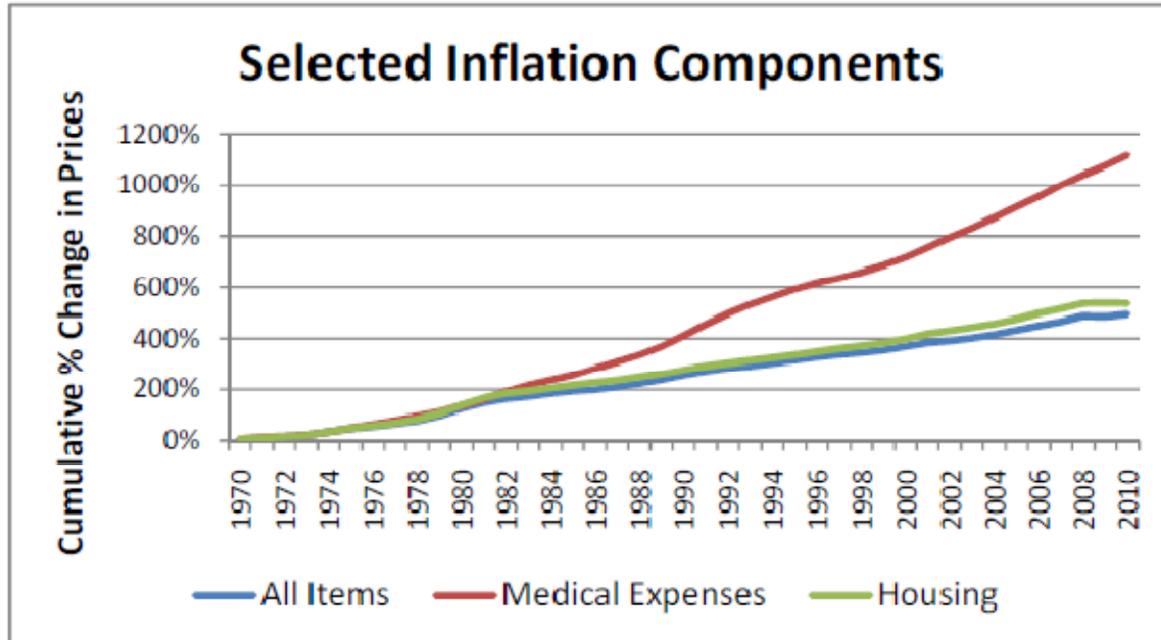
### Managing the Risks of Retirement Finances: Focus on Inflation Part I

We start with some data to provide some historical perspective. All the data here is taken from the Bureau of Labor Statistics website. The Consumer Price Index (CPI) has various components and variations. First we'll look at All Items CPI which is the overall headline inflation reported by the media.



The chart above shows that inflation has been somewhat erratic over the past 40 years and generally higher than recent years. The compounded rate of change since the beginning of 1970 is 4.4% annually. This is more than double the rate we've seen over the last 10 years and serves to highlight that a period of high inflation has large effects that are not necessarily "balanced out" by a period of low inflation. Later, we'll use this historical inflation scenario to analyze the impact of inflation surges on retirement spending.

In order to illustrate the nature of compounded price inflation we need to look at the cumulative percentage change through time. The chart below shows the “all items” data from the first chart in compounded form in the blue line. We see that from 1970 to 2010 overall prices rose by 494%.



Housing costs, the green line, rose by a cumulative total of 536%. Meanwhile, healthcare costs, shown in red, far outpaced everything else by rising 1,118% over the period. This is especially significant for retirees since medical expenses are likely to constitute a higher proportion of their expenses than the general population. On the other hand, if you own your house, you do not experience rising rents; your house returns (rent value) match such increases.

### Inflation’s impact on Retirement Spending

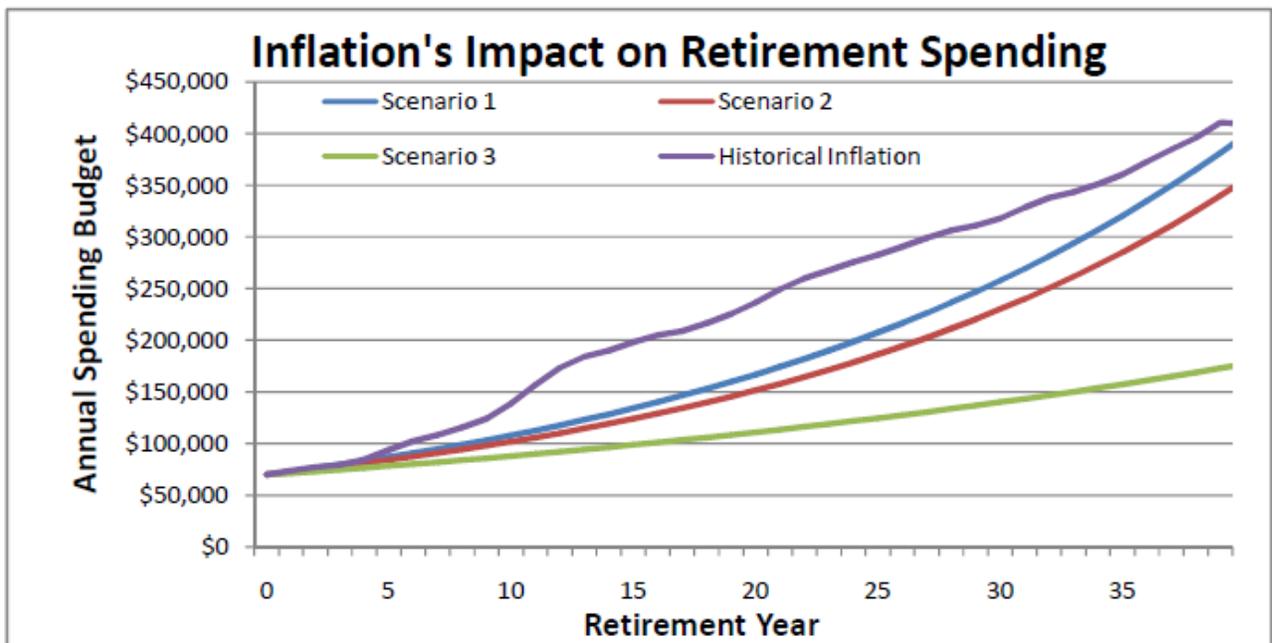
We’ll use a retirement budget to estimate inflation’s impact on living costs. The following budget assumes a retired married couple at age 55 living in the San Francisco Bay Area. To focus on inflation we’ll ignore taxes.

Spending Category	Annual Budget	% of Budget	% Weight in CPI
Housing	\$24,000	38%	32%
Food	8,000	11%	15%
Clothing	2,000	3%	4%
Transportation	6,000	9%	17%
Recreation	5,000	7%	16%
Travel	6,000	9%	1%
Healthcare	10,000	14%	7%
Utilities, Phone, etc.	4,000	6%	8%
Other	5,000	7%	10%
<b>Total</b>	<b>\$70,000</b>		

Notice that the percentages in the budget are a bit different than the basket of goods used for the CPI. This breakdown may not be how you would spend your money, but we can still use it to assess the risks of inflation for retirees. Housing and healthcare are the two largest budget categories and we'll break these out for special attention in our analysis.

The graphic below shows how our annual retirement spending grows through time in four different scenarios:

1. All expenses grow at a constant 4.4% annually – the CPI growth rate from 1970 to 2010.
2. Healthcare costs grow at their historical rate of 6.3%, housing expenses grow at only 2% (because we have rent control or own our house) and all other expenses grow at 4.2% (historical CPI excluding housing).
3. Housing expenses grow at 2.3%, medical expenses grow at 3.1% and the CPI excluding housing grows at 2.1% - all at half the historical rates.
4. Historical Inflation: all expenses grow as they would have if you had retired at the beginning of 1970 – using the actual path of inflation over 40 years.



Scenario 1 is typical for renters (without rent control), scenario 2 is meant to be more typical for retirees in California, and scenario 3 is a very optimistic scenario that only happens if the government figures out how to balance the budget without pushing up inflation.

The Historical Inflation scenario highlights a key risk – if high inflation occurs early in retirement and then subsides, it will still permanently raise the entire path of spending across all future years and vastly increase total spending compared to a steady rate of inflation.

The table below shows total spending for each scenario calculated for a 30 year retirement and also for 40 years.

Retirement Years	Total Spending in Millions of Dollars by Scenario			
	Scenario 1	Scenario 2	Scenario 3	Historical Inflation
40 years	7.7	7.0	4.7	9.5
30 years	4.4	4.1	3.1	5.9

It should be clear in looking at the chart and the table that living a long time in the presence of inflation requires a lot of dollars. Burying \$3 million in the backyard is not going to cover it unless politicians stop spending *and* you plan on dying early.

With long term treasury bonds yielding 3%, bonds are only marginally better than cash in the backyard. There are three things you can do to reduce the risk of running out of money in retirement:

1. Save more money before you retire by spending less or working longer.
2. Shorten your retirement by working longer or smoking 3 packs a day.
3. Choose investments whose cash flows increase along with inflation.

Because most people don't like #1 or #2, and because we are in the investment management business, we'll focus on the third alternative.

### **Inflation's impact on Investment Returns**

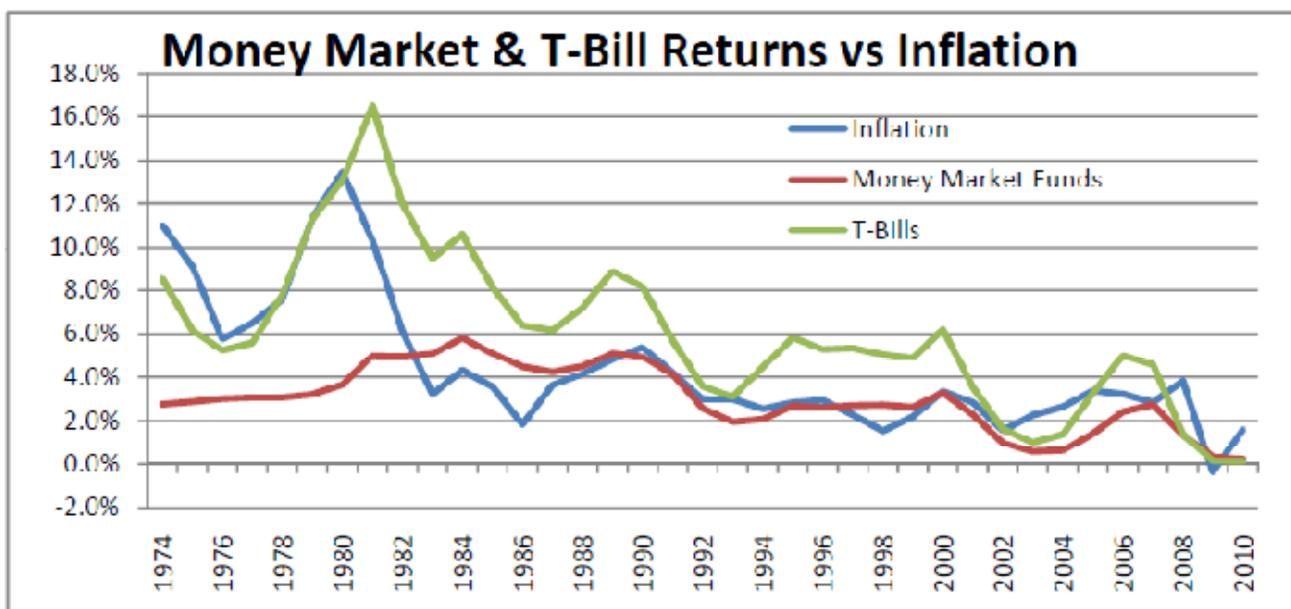
When choosing investments to compensate for the effects of inflation on retirement spending, we have two objectives:

1. Investment returns that tend to increase when inflation increases
2. Earn large excess returns over the inflation rate (consistent with our risk tolerance) so as to minimize the chance of outliving our savings.

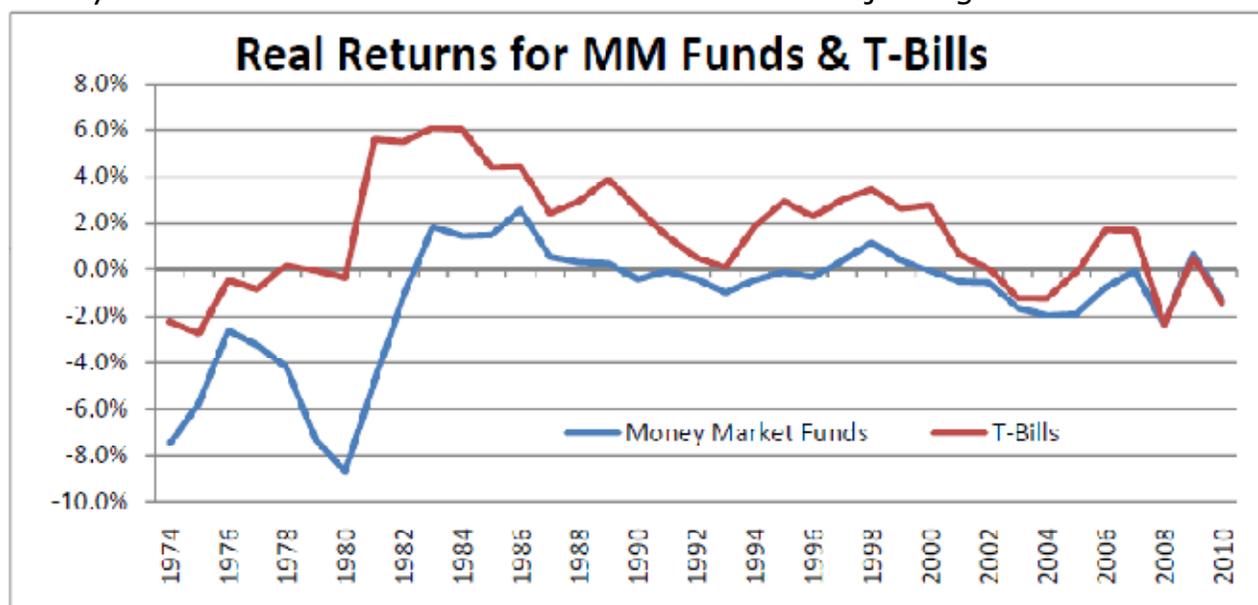
With these objectives in mind, we'll analyze the historical performance of various types of investments. This newsletter will analyze the low risk liquid alternatives: cash, money market funds, and Treasury Bills. We'll save the rest for a subsequent newsletter.

### **Cash and Money Market Funds**

First, let's look at the lowest risk, most liquid assets: cash, money market funds and U.S. government Treasury Bills (T-Bills). The T-Bill returns in the chart on the next page are for three-month maturity bills. The horizontal axis represents the return on cash – namely zero. The blue inflation line thus represents the annual loss in purchasing power of cash. Up until the mid-1980s, money market funds also lagged inflation significantly. In general, we can expect that money market funds will come close to matching inflation - except in times like now when the Federal Reserve (the Fed) is pushing short term interest rates below the inflation rate to stimulate the economy.



In analyzing returns it's useful to look at "real" returns – meaning the return after adjusting for the decline in purchasing power caused by inflation<sup>1</sup>. The returns we observe are called nominal returns; a real return is roughly the nominal return minus the inflation rate. The chart below shows returns on money market funds and T-Bills in real terms after adjusting for inflation.



The inflation adjusted T-Bill yields shown above are known as the real interest rate. They reached a historical high in the early 1980's when the Fed used high real interest rates to tame the runaway inflation of the 1970's. In the 2000's real interest rates have frequently been negative as the Fed focuses on stimulating job growth while battling recessions. Given the country's debt

<sup>1</sup> Technically, to be exact, the real return = (1+ nominal return)/(1 + inflation) - 1

burdens that are holding back U.S. growth, it seems likely that the Fed's negative real interest rate policy will remain in place for an extended period. This is not good news if you want to invest in low risk assets; it requires that you accept negative real returns.

### **Funding Retirement Spending with Low Risk Investments**

Combining our retirement spending inflation scenarios above with a low risk "T-Bill only" investment strategy, we can estimate how roughly much savings is required to retire. We simplify this exercise to focus on inflation by ignoring both taxes and social security. (If you're lucky your social security will cover your taxes). Currently the T-Bill yield is 0.05% and inflation is at 3.6% offering us a -3.55% real return on savings. While this situation is likely to persist for the next year or two, in the longer run we can expect that real yields on T-Bills will reach 1.5% - the average since 1970. Thus our scenario analysis will consist of the previously detailed inflation scenarios and a savings balance that earns the inflation rate plus 1.5% annually. The question we wish to answer is: "How much is required in savings at the start of retirement?"

Note that we must refine Scenario 2 because it implies rent control or home ownership. Capital tied up in the house is inconsistent with our current assumption that all savings are invested in T-Bills. Therefore, for our purposes, we'll assume the retiree in Scenario 2 lives in a rent controlled unit. As a result, our expenses in this scenario grow slower than inflation; all the other scenarios call for spending to go up in line with inflation. The following table gives the required starting savings needed to fund the retirement budget on page 2 under scenario 2 and under the other inflation matching scenarios.

	<b>Starting Savings Required to Fund Spending for:</b>	
Years Retired	Scenario 2 spending	Scenarios with spending up with inflation
30 Years	\$1,569,041	\$1,681,109
40 Years	\$1,936,850	\$2,094,109

### **Effects of Variability of Real Returns**

In order to calculate the numbers in the table above, we made the assumption that the real rate of return on T-Bills was always exactly 1.5% across every inflationary environment. This is why we end up with the same savings requirement for all the scenarios where spending is in line with inflation. In reality, real rates of return are constantly changing depending on economic conditions. While various different combinations of high and low rates of return lead to the same average, they will not lead to the same ending balance in your bank account. Retirement funding will always be subject to risks related to the sequence of annual real returns that you experience in retirement. Therefore when you want to assess your retirement risks you will need to calculate potential outcomes under various possible ways the world

could play out. The best tool for doing this kind of risk analysis is called Monte Carlo simulation. It sounds like gambling and for good reason – these simulations use random numbers to determine many possible sequences of events along with the probabilities of bad versus good results. Such math is beyond the scope of this newsletter, but it is available to our clients should they wish to assess their needs for more savings or higher returns.

### **Conclusion**

Given earlier retirements and longer life spans, inflation poses a serious risk to retirement security. Investments must be evaluated both for their total expected returns and for their ability to rise with inflation. Thorough retirement planning requires thoughtful consideration of the mix of investments and sophisticated analysis of risks using simulation to capture the effects of variations in inflation and real rates of return. Future newsletters will provide further context for retirement planning by examining inflation's impact on the returns to risky assets such as stocks, bonds, and real estate.

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