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## Inflation, Living Standards, and Returns

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Investors are concerned about inflation, and rightly so. Average annual inflation in the US between 1929 and 2008 was nearly 3.3%. A dollar at the end of 2008 had about the same purchasing power as eight cents did at the beginning of 1929. Protecting the purchasing power of an investment portfolio is a genuine concern.

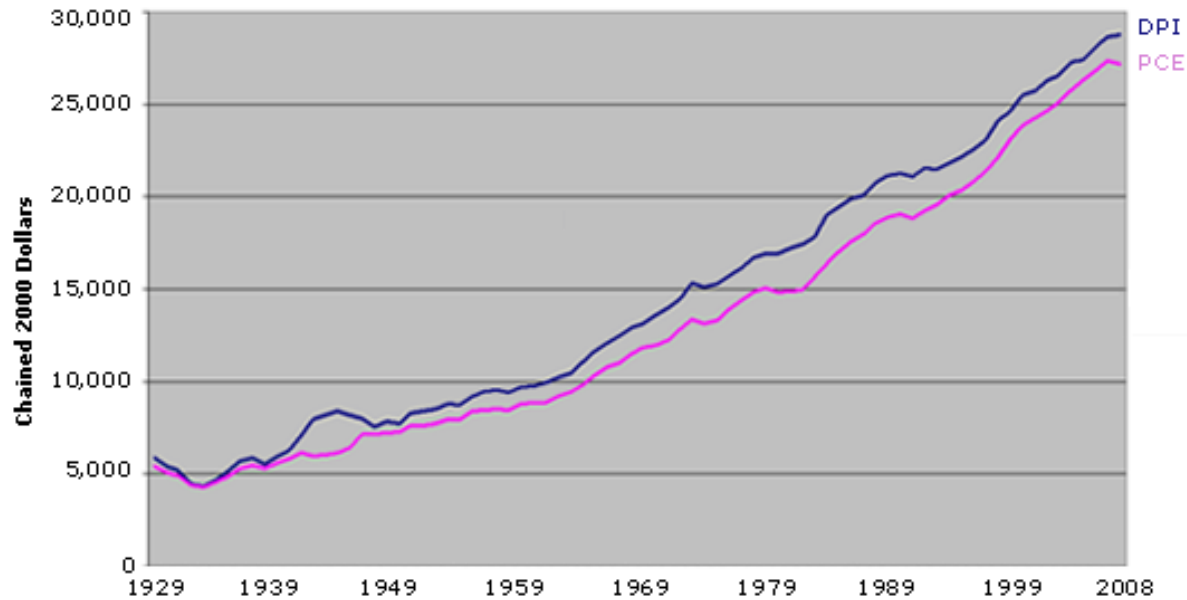
Inflation is not the only issue for investors, however. An interesting strand of economic research addresses the idea that people do not simply care about their own standard of living; they are also concerned about how their living standards compare to those of other people.<sup>1</sup> If everyone around me is enjoying a higher standard of living over time, I do not want to be left behind in an economic sense. In the language of the papers that have been written on this topic, I want to "keep up with the Joneses."

Figure 1 shows evidence that this may be a genuine concern for consumers. This chart shows annual observations of per capita real disposable personal income (DPI) and per capita real personal consumption expenditures (PCE) for 1929-2008. The series are in real (2000) dollars, so the upward trend is not caused by inflation. The numbers are per capita, so they do not simply reflect a growing population. Instead, this chart arguably reflects a substantial increase in living standards for US consumers over the past several decades. As a result, it shows why just keeping up with inflation is not enough. Real spending and income levels increased from around \$5,000 to more than \$27,000 between 1929 and 2008, representing an average increase of more than 2% per year. A consumer who just kept up with inflation

would still be at the 1929 levels, while the overall level increased five-fold since then. If all I did was to keep up with inflation, the Joneses would have left me in the dust.

**Figure 1**

**Per Capita Real Disposable Personal Income (DPI) and Personal Consumption Expenditures (PCE) 1929-2008**



Source: Bureau of Economic Analysis.

How well have stocks and bonds protected investors against both inflation and rising living standards? Table 1 shows some evidence for 1942-2008.<sup>2</sup> This table reports average annual returns in excess of both inflation and a measure of changes in living standards. Each year, the excess return for an index is:

$$R(\text{excess}) = \{1 + R(\text{index})\} / \{[1 + \text{inflation}][1 + \Delta\text{PCE}]\} - 1$$

$R(\cdot)$  is a return, and  $\Delta\text{PCE}$  is the relative change in PCE for the year. Table 1 shows

that fixed income securities have generally not done a good job of keeping up with both inflation and the Joneses. In contrast, the average excess returns for the stock indices are reliably above zero and large enough to be economically meaningful.

**Table 1**

**Average Annual Returns in Excess of Inflation and Per Capita Real PCE Changes 1942-2008**

<b>Index</b>	<b>Average Excess Return</b>	<b>Standard Deviation</b>	<b>t-statistic</b>
30 Day Treasuries	-1.81%	3.79%	-3.90
90 Day Treasuries	-1.37%	4.05%	-2.77
1 Year Treasuries	-0.87%	4.74%	-1.50
2 Year Treasuries	-0.68%	5.47%	-1.01
5 Year Treasuries	-0.26%	7.19%	-0.29
10 Year Treasuries	-0.20%	9.56%	-0.17
30 Year Treasuries	0.24%	12.33%	0.16
Long-Term Corporate Bonds	0.03%	10.06%	0.03
All US Stocks	6.07%	17.87%	2.78
Value Stocks	11.04%	22.21%	4.07
Small Cap Stocks	9.71%	25.59%	3.11

The US Treasury indices are from CRSP, the Center for Research in Security Prices at the University of Chicago. The Long-Term Corporate Bond Index is from Ibbotson Associates. Small Cap Stocks and All US Stocks are the CRSP 6-10 Index and the CRSP Value Weighted Index, respectively. Value Stocks are the top 30% of the annual book-to-market ranking, using NYSE breakpoints. The returns for this index are from Ken French's website. Per Capita Real PCE is from the Bureau of Economic Analysis, and the CPI U is from the Bureau of Labor Statistics.

At this point, the professor in me wants to ask a multiple choice question. In view of

the foregoing information, what is the most appropriate response?

- a. "Since I want to keep up with both inflation and the Joneses, Table 1 tells me that I'd better put my portfolio in stocks."
- b. "Inflation is all that matters. Those gains in living standards are a thing of the past."
- c. "Historically, stocks have had returns high enough to cover both inflation and living standards. However, stocks are risky (recall 2008). Therefore, like most things in economics, there is a trade-off. The right answer for me depends upon how much risk I am willing to accept. Of course I want to maintain (or increase) my living standards, but I am not willing to take on an amount of risk that will keep me awake at night. My portfolio will contain both stocks and bonds, because that's good diversification. How much of each depends on my risk tolerance."
- d. "Capitalism is dead. All my money is going into canned goods and ammunition."

If I am grading the exam, answer (c) gets the points. If you answered (a), I think you are ignoring the risk that went along with those stock returns in Table 1. If you answered (b), I think you are overlooking the source of our increased living standards. The rising income and consumption series in Figure 1 are the result of sustained productivity gains. Productivity increases through technological advances, and technological advances are a natural result of financial rewards for entrepreneurial activity. As long as the economy is allowed to reward innovation, there should be at least the opportunity for continued increases in living standards. If you answered (d), I have to wonder why you're still reading this.

This discussion ignores the role of labor income in maintaining living standards. Incorporating the interrelationships among labor income, living standards, and asset returns would take the analysis to another level of complexity. Accordingly, that

discussion is left for another day.

Improved living standards are a good thing, but people who don't fully participate in the improvement can start to feel as though they are being left behind. Rising living standards can therefore present a challenge to investors who do not want to be economically worse off than friends, neighbors, and relatives (i.e., the Joneses). While some may see the emphasis on keeping up with others as shallow, those who have experienced a decline in relative living standards probably do not. Because of current fiscal and monetary policies in the US and elsewhere, many investors are focused on inflation. This analysis suggests that we should not myopically focus on inflation to the exclusion of other important factors.

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<sup>1</sup>For example, see John Y. Campbell and John H. Cochrane "By Force of Habit: A Consumption-Based Explanation of Aggregate Stock Market Behavior.," *Journal of Political Economy* 107: 205-251.

<sup>2</sup>The PCE data are available back to 1929, but several of the fixed income indices are not available until 1942. The year-end Treasury yield curves for 1941 and 2008 look very similar, so the fixed income excess returns in Table 1 should not be biased by a sustained one-way move in interest rates. The stock index returns may be biased upward, because 1942-1945 were very good years for stocks. Excluding these years produces average excess returns of 5.21% for All Stocks, 9.29% for Value Stocks, and 7.54% for Small Cap Stocks. The corresponding t-statistics are 2.30, 3.41, and 2.43.

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