



C A M B R I D G E A S S O C I A T E S L L C

INVESTMENT PUBLICATIONS HIGHLIGHTS

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Investment Publications Highlights

Summarized by Published Research Team

“Economic Growth and Equity Investing”

by Bradford Cornell, *Financial Analysts*

Journal, January/February 2010

Over the long run, investors should expect real U.S. equity performance to go no higher than 4% to 5%. More work still needs to be done on international equities, but “the basic outlook appears to be quite similar.”

The long-run performance of equity investments is fundamentally linked to growth in earnings, which in turn is constrained by real GDP.

Research that looks at historical rates of economic growth suggests that real GDP growth in the developed world is unlikely to exceed 3% in the long run. Real per capita GDP growth has been roughly 2% over very long periods of time. Population growth will add no more than 1% to aggregate real GDP growth. Given dilution effects to existing investors from start-ups and net new share issuance, and factoring in dividends, investors should therefore anticipate returns on U.S. common stocks to average no more than 4% to 5% in real terms.

Growth theory studies expansion in the standard of living as measured by real per capita GDP. In neoclassical economics, over the long term, real per capita GDP growth is entirely attributable to technological innovation. While capital can be added to improve GDP growth, this occurs at a diminishing rate. Once the marginal product of capital is equal to its marginal cost, companies will no longer invest in capital additions because they will not result in higher marginal income. This is referred to as a steady state economy in which the ratio of capital to labor remains

constant. However, if the marginal benefit from capital is enhanced through technological improvements, further investments in capital will be made, resulting in real increases in per capita GDP. Economies can grow at a rate faster than that dictated by technological improvement if they are not yet in a steady state but are in a period of capital deepening in which the marginal cost of capital is well below the marginal benefit. Currently, there is a dearth of information on whether the rate of technological innovation is sustainable, but one study suggests that from 1950 to 2005, the rate of technological progress remained constant.

Since the average growth rate of earnings is constrained by economic activity, it is necessary to evaluate the limits economic growth places on earnings. Since 1923, developed economies have averaged real growth in per capita GDP of 2.19%, increasing to 2.42% if the data start in 1960. Mature economies undoubtedly show lower growth than developing economies, where since 1923 and 1960 growth has averaged 2.32% and 2.79%, respectively. With the United States arguably the closest to the steady state at the onset of the time periods, it is not surprising to find that it has the lowest growth rates among developed economies (1.8% since 1802, 1.42% since 1923, and 1.14% since 1960).

Converting per capita GDP to aggregate growth requires an estimation of population growth rates. Historical statistics since 2000 show that population growth averaged 0.34% for mature economies (0.88% for the United States) and 0.94% for developing economies. Forecasts through 2010 have populations growing at 0.48% for mature economies (0.97% for the United

States) and 0.96% for developing economies. Based on these data, population growth can be expected to add no more than 1% to aggregate real GDP growth, for a total aggregate real growth rate not exceeding 3%.

Earnings growth should be bound by real GDP growth to the extent that the ratio of earnings to GDP is stationary. Although the ratio of earnings to GDP is volatile, it has exhibited mean reversion since 1947, implying that over the long term, GDP growth does in fact place a limit on earnings growth. The volatility of this ratio suggests that when earnings are low relative to GDP, they grow more quickly and the reverse is true when earnings are high.

Therefore, investors should expect aggregate real earnings growth to match, but not exceed, real GDP growth over the long term. Alas, existing investors in equities experience dilution as companies tend to issue more shares than they repurchase over time and as new companies are started to which existing investors do not automatically have a claim. The average rate of dilution from both of these sources combined was 2% from 1926 to 2008, with the majority of dilution coming from the creation of new shares as new companies capitalize their business with equity.

The impact of start-ups is not surprising, as more than half of U.S. economic growth comes from new enterprises. Given the continuing importance of start-ups, the rate of dilution is unlikely to decline unless the rate of innovation slows, and if the rate of innovation slows, it is likely that GDP growth will also decline. To account for the rate of dilution, approximately 2% must be deducted from the growth rate of aggregate earnings.

Putting all these pieces together, it is apparent that earnings growth is bounded by the 3% real GDP growth and dilution subtracts 2%. By

adding the expected dividend yield (using either a current yield of 3.1%¹ or a 50-year average yield of 3.3%), one should expect long-run real returns on U.S. common stocks to average no more than 4% to 5%. Analysis on international equities is incomplete, but the outlook appears to be similar.

“From Feast to Famine” by Tim Bond, Barclays Capital, February 11, 2010

The recent episodes of financial market crises were in large part due to underlying capital flows generated by the combined impact of baby boomers in developed economies, along with the rapid increase in per capita income in developing economies. An abundance of savings seemingly weakened the collective discrimination of risk and reward in investment, resulting in the serial misallocation of capital and asset bubbles. Demographic trends suggest that the frequency of bubbles should start to decline. However, the same trends also suggest that equity valuations are likely to fall in the coming decade, though returns should be positive. Bonds, on the other hand, will face considerable rising yield pressures and underperform equities.

Contrary to popular opinion, greedy financiers did not kill the Great Moderation. Rather, the credit crisis of 2007–09 was the latest in a string of disruptive episodes in a series of similar events that began to occur with greater frequency late in the last century. Thus, the recent credit crisis was just a symptom of much larger and longer-lasting underlying forces.

As with any dramatic socioeconomic change, the force behind the demise of the Great Moderation

¹ While this article was just published in the January/February 2010 *Financial Analysts Journal*, the author quotes the “current” dividend yield as of year-end 2008. As of the end of February 2010, the dividend yield on the S&P 500 was 2.0%.

is people. Initially, the maturing of the boomer generation into their peak productivity and savings ages helped create the Great Moderation. With labor, capital, and consumption all abundant, it was natural that economic volatility declined. Rapid growth in the labor force helped stifle wage inflation spirals of the 1970s, while the growing abundance of savings reduced the cost of capital and provided the means for productivity-boosting investments. The vast workforces of the developing nations, meanwhile, began to integrate into the global economy, offering a further check on any incipient inflation. Limited inflation risks prolonged the growth portion of business cycles and allowed policymakers to ease aggressively during recessions.

As the boomers aged and the developing nations became wealthier, these initial effects began to shift in a less benign direction. In particular, asset market volatility rose. The first warning sign may have been the Asian bust of 1997–98. Strong foreign capital inflows, together with a high level of domestic savings, financed an unsustainable investment boom. Put differently, the size of the pool of capital available to finance Asian investment was disproportionate to the availability of productive local investment opportunities. After the Asian financial crisis, the second warning signal was the equity market bubble and bust during the 1997–2002 period. In part, this phenomenon was a product of the developed world's boomer generation reaching their age of peak equity accumulation.

Demographic factors can explain changes in equity market valuations that are otherwise hard to rationalize. Equities are tokens of inter-generational wealth transfer. As such, their valuation appears to be partly determined by changes in the composition of populations. From the 1950s, when equities first became mass-market savings vehicles, changes in equity valuations became closely associated with the

growth in the retired population and the ratio of the high savings age population to the general population.

The rise in equity valuations during the 1990s was therefore in good part attributable to the large increase in the share of the population that had reached the age at which net saving is strongest (i.e., people 35 to 54 years of age). In the United States, this group rose from 24% of the total population in 1989 to a peak of 30% by 2002. At the same time, the growth rate of the newly retired cohort slowed sharply, turning negative between 1996 and 2002. With the population of equity buyers growing strongly, while the population of sellers shrank rapidly, a valuation bubble emerged during these years. Contributing to upward pressure on valuations was the mild inflation environment, which allowed interest rates to remain low. The most significant driver was the integration of developing market workforces into the global supply chain, a factor that maintained strong deflationary pressure on the prices of globally traded goods.

The unbalanced reaction of central banks to asset price inflation also fuelled bubbles, as monetary policy shifted in recent years from targeting excessive economic exuberance to being more focused on consumer price inflation. Following crises such as the 2001–03 market crash, low interest rates were used to help support asset prices, but never hiked once valuations became excessive.

The aging of the populations of the developed world and the rising prosperity of the populous developing nations will continue to shape economic and market behavior. As the developed world's boomer generation moves into retirement, net savings balances are falling in these economies. Some of the large developing economies (e.g., Brazil and China), meanwhile, also have aging populations. The era of capital

abundance that has generated increasingly frequent financial crises is drawing to a close. Unfortunately, such an environment will prove less favorable for financial asset valuations.

The de-rating of equity markets visible since 2001 reflects the beginning of this shift, as the boomer generation ages beyond years of peak equity accumulation. Indeed, the acceleration in the growth of the newly retired population, along with the shrinkage in the proportion of the population in the high savings age bracket, should continue to lower the equilibrium valuation of equity markets. It is important to note that the implication of this is that the standard mean reversion logic of equity valuation techniques is incorrect. The equilibrium valuation of the demographic model, in contrast, fluctuates, shifting in accordance with the underlying changes in the age distribution of populations.

The over- or undervaluation of equities relative to the equilibrium, meanwhile, contains important information for tactical asset allocation. For instance, many investors missed buying the equity lows of last year because valuations had not fallen to levels seen in the previous secular bear market of the 1970s. However, the equilibrium equity valuation was much lower in the 1970s than it is at present, as the high savings age population of the 1970s was a considerably smaller share of the total population. Hence, relative to the equilibrium, equity valuations in early 2009 were in fact cheaper than they were in the 1970s.

Barclays Capital's demographic model projects U.S. price-earnings ratios to fall to roughly 11 during the first half of the decade, before recovering slightly in the subsequent five years.

Average annualized rolling ten-year U.S. operating earnings growth over the past few decades has been 6.3%. If earnings average a similar growth rate over the next decade, the average annualized price return from equities should be approximately 4.1%. The average dividend yield over the past two decades, meanwhile, has been 2.2%. Incorporating the drop in valuations, earnings, and dividends suggests an average nominal annualized return of equities of 6.3% over the next decade (7.3% if dividends are re-invested).

The prospects for bond markets, meanwhile, are poor. Bonds initially received a strong boost as boomers shifted asset allocations from equities into fixed income. This was reinforced by the equity market crash in 2001–02, which accelerated this process. Regulators also helped by tightening accounting and liquidity measures for pension and insurance companies, and encouraging them to buy more debt instruments. However, strong demand helped mask deteriorating underlying credit fundamentals, which were revealed most starkly by the housing market crash. As boomers save less and governments must borrow more to fund pension and healthcare obligations, bond yields will soar going forward. For example, according to the International Monetary Fund, the impact of the credit crisis on fiscal deficits is just 5% of the overall impact from aging. These factors, combined with potential inflationary pressure from a shrinking workforce, could cause long-term government yields in both the United States and United Kingdom to more than double from current levels over the next decade. The risk premium for equities, given these trends, should rise over the next decade. ■

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