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In This Issue: **Growth, Value, and Payout Policy**

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Is Economic Growth Good for Investors?[1]

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Economic growth is widely believed to be good for stock returns, and forecasts of growth are a staple of international asset allocation decisions. Investing in emerging markets with good long-term growth prospects, such as China, is widely viewed as more attractive than investing in countries like Argentina, with prolonged periods of low growth that are expected to persist. But does economic growth always—or even generally—benefit stockholders?

Surprisingly, the answer is no, on both theoretical and empirical grounds. For 19 countries with continuously operating stock markets during the 112-year stretch from 1900 through the end of 2011, the cross-sectional correlation between returns and the growth rate of per capita gross domestic product (GDP) is negative—to be more precise, the correlation coefficient is -0.39. This negative correlation suggests that investors in 1900 would actually have been better off investing in the companies of nations that ended up experiencing lower per capita growth than in those countries that enjoyed higher average growth rates.

In 1900, most of these 19 countries were considered economically advanced, or "developed," nations, and their publicly traded companies likely accounted for 90% or more of the market value of the world's equities at that time. This negative correlation between per capita GDP growth and equity returns has been experienced not only by developed countries, however, but by developing economies as well. For 15 emerging markets during the 24-year period from 1988 to 2011—including the BRIC countries of Brazil, Russia, India, and China—the correlation is a remarkably similar -0.41.

I am not arguing that economic growth is bad. There is ample evidence that people who live in countries with higher incomes have higher standards of living and longer life spans. But even though consumers and workers typically benefit from economic growth, the owners of capital do not necessarily benefit. As I will discuss later, countries can grow rapidly—and for considerable periods of time—by applying more labor and capital, but without the owners of capital earning high returns. And it's much the same story with economic growth due to technological advances: Unless technological change comes from companies with some kind of pricing power, the resulting improvements in productivity typically end up contributing mainly to higher standards of living for workers and consumers, and not to higher shareholder returns.

In this article, I start by documenting the negative correlations between long-run economic growth and stock returns for both developed countries and emerging markets—and go on to offer a number of explanations for this somewhat surprising relationship. Then I explain why the standard of living in a country can grow rapidly without investors earning high—or, in many cases, even just competitive—returns. In the final section, after relating past per capita income growth to historical stock returns, I consider the relation between economic growth and *future* expected returns. The major determinant of future returns is the earnings yield—the reciprocal of the price-earnings ratio—that investors are paying today. From a managerial perspective, I focus particular attention on two variables: the percentage of earnings that companies reinvest in the business, and the rate of return on such reinvestment. As finance professors have long taught their students, the key to adding value for shareholders is for companies to invest in all positive net present value (NPV) projects—while at the same time committing to return to their investors through dividends and stock buybacks all capital and cash flow that cannot be so reinvested.

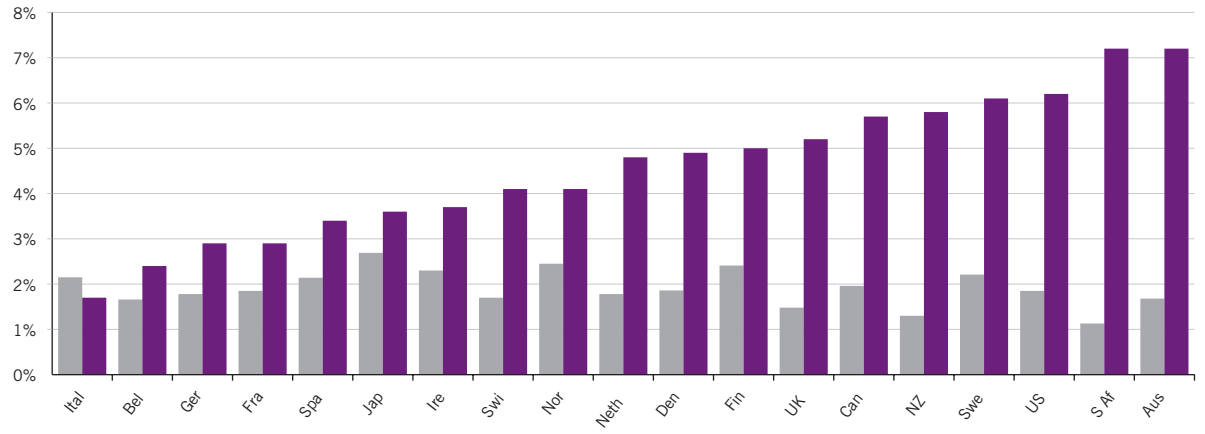
The Negative Correlation Between GDP Growth and Real Stock Returns

To the best of my knowledge, the first mention of a negative cross-country correlation between real per capita GDP growth and real stock returns was by Jeremy Siegel in the second edition (2002) of his book, *Stocks for the Long Run*. Siegel's claim, however, was based on data that go back only as far as 1970.

In Table 1 and Figure 1, I summarize the existing evidence showing the negative correlation from 1900-2011

1. This paper updates and extends through 2011 the findings that were first presented in my 2005 *Pacific-Basin Finance Journal* article, "Economic Growth and Equity Returns," which contains a more complete list of citations and references. I want to thank Leming Lin for excellent research assistance, and the editor, Don Chew, for extensive suggestions and guidance. Comments from Jeremy Siegel and participants at the TAPMI International Conference in Banking and Finance in Bangalore and seminars at the Australian National University and the University of Melbourne are also appreciated.

Figure 1



Real per capita GDP growth rate per annum (on left in gray) and real equity return per annum (on right, in purple), 1900-2011. The real return data (dividends plus capital gains, adjusted for inflation, in local currency units) are from Dimson, Marsh and Staunton (2012). Real per capita GDP growth rates are from the World Bank, Dimson, Marsh and Stanton (2012), and Maddison (2010).

between real per capita gross domestic product (GDP) growth and real stock returns for 19 mostly developed countries with continuously operating stock markets since 1900.[2] Throughout this article, all stock returns and income growth rates are expressed in dollars of constant purchasing power—in other words, they have been adjusted for inflation. The source of the average long-run stock returns is the *Credit Suisse Global Investment Returns Sourcebook 2012*, which contains the most recent annual update by Elroy Dimson, Paul Marsh, and Mike Staunton of London Business School of findings that were first published in their 2002 book *Triumph of the Optimists*.[3] The book reported finding a negative correlation between real stock returns and real per capita economic growth for 16 countries during the period 1900-2001.[4] And since the publication of their book, Dimson, Marsh, and Staunton have presented extensive additional analysis of the negative correlation for additional countries and other time periods in their 2005 and 2010 *Yearbooks*.

As stated earlier, the correlation of real per capita GDP growth and real stock returns for 19 countries with stock markets since 1900 is -0.39 (p-value=0.10) when the returns are measured in local currencies. When the returns are adjusted for changes in the exchange rate relative to the U.S. dollar, so that they represent what a U.S. investor would have received, Table 1 reports that the correlation changes slightly, to -0.32 (p-value=0.14). The import of these findings is that an investor would have been better off avoiding countries where per capita GDP rose the most and investing in countries with slower per capita growth.

As can also be seen in the table, long-run average per capita real GDP growth rates range from a low of 1.1% for South Africa to a high of 2.7% for Japan. The average compounded real returns on equities stretch on the low end from 1.7% for Italy to over 7% for Australia and South Africa, with returns in the U.S., Canada, and the U.K. all being in the 5% to 6% range.

What do the high-return countries have in common? First of all, the top seven countries—Australia, South Africa, the United States, Sweden, New Zealand, Canada, and the United Kingdom—all have had the good fortune to avoid having major wars fought on their own soil in the last century, a misfortune that befell most of the continental European countries. Second, the high-return countries, with the exception of Sweden, are English-speaking with traditions of English common law and, apart from South Africa, long histories of democratic government and universal suffrage. Third, and also worth noting, several of these countries have had economies where the natural resources sector has played an important part in their success.

Alongside the long-run average stock returns and per capita growth rates, Table 1 also reports the average dividend yield and growth rate of real dividends per share for the same 19 countries. One of the most notable patterns is the strong association between high dividend growth rates and high overall stock returns. In one sense, such an association is not surprising in that growing dividends tend to reflect increases

2. Some of the markets have temporarily suspended trading due to war, etc. For example, the U.S. stock market closed on Sept. 11-14, 2001 following terrorist attacks. None of the 19 markets saw investors wiped out, however, unlike Russia in 1917 and China in 1949. Note that in the case of both Russia and China, both bond investors and equity investors were expropriated.

3. Also, see Elroy Dimson, Paul Marsh, and Mike Staunton, "Global Evidence on the Equity Risk Premium," *Journal of Applied Corporate Finance* (Fall 2003).

4. For Germany, Dimson, Marsh, and Staunton exclude the 1922-1923 hyperinflation years.

Table 1 **Real Annual Per Capita GDP Growth Rates and Stock Returns, 1900-2011**

Country	Real per capita GDP growth	Mean geometric real return		Real dividend per share growth	Dividend yield
		Local currency	U.S. dollars		
Australia	1.68%	7.2%	7.3%	0.99%	5.7%
South Africa	1.13%	7.2%	6.4%	1.05%	5.8%
United States	1.85%	6.2%	6.2%	1.31%	4.2%
Sweden	2.21%	6.1%	6.2%	1.80%	4.0%
New Zealand	1.30%	5.8%	5.5%	1.17%	5.4%
Canada	1.96%	5.7%	5.7%	0.67%	4.4%
United Kingdom	1.48%	5.2%	5.2%	0.45%	4.6%
Finland	2.41%	5.0%	5.1%	0.23%	4.8%
Denmark	1.86%	4.9%	5.4%	-0.96%	4.6%
Netherlands	1.78%	4.8%	5.2%	-0.61%	4.9%
Switzerland	1.70%	4.1%	5.1%	0.47%	3.5%
Norway	2.45%	4.1%	4.4%	-0.07%	4.0%
Ireland	2.30%	3.7%	4.0%	-1.29%	4.5%
Japan	2.69%	3.6%	4.2%	-2.36%	5.2%
Spain	2.14%	3.4%	3.5%	-0.58%	4.2%
France	1.85%	2.9%	2.8%	-0.75%	3.8%
Germany	1.78%	2.9%	3.2%	-1.27%	3.7%
Belgium	1.66%	2.4%	3.0%	-1.48%	3.7%
Italy	2.15%	1.7%	1.8%	-2.21%	4.0%
Correlation of growth and returns		-0.39	-0.32		
p-value		(0.10)	(0.18)		

For real per capita GDP growth per year, data come from an updated version of Angus Maddison (1995) Monitoring the World Economy 1820-1992 Paris: OECD Development Centre Studies, as explained in Appendix Table A-1 for 1900-2008, and from the World Bank's World Development Indicators for 2008-2011. Real per capita income is expressed in terms of dollars of 1990 Geary-Khamis dollars (purchasing power parity-adjusted) through 2008 multiplied by the ratio of 2011/2008 real per capita income in local currency units from World Development Indicators to obtain the 2011 number, and converted into an annualized number. The South African GDP numbers start in 1913 rather than 1900. The geometric mean annual real dividend growth rates, dividend yields, and real returns (dividends plus capital gains) per year from Dimson, Marsh, and Staunton (2012) are used for 19 countries for the 112 years from 1900-2011. The equally weighted mean real return is 4.6% per year in local currency units and 4.7% per year in U.S. dollars, and the mean per capita growth rate of real GDP is 1.8% per year.

in earnings per share. But there is likely to be another effect at work here—namely, the role of dividends (and, in the case of the U.S., stock repurchases) in limiting what might be called the "overinvestment problem," or the pursuit of growth-for-growth's sake.

Take the case of Japan, where average growth in dividends per share has actually been negative in real terms (-2.4% per year) at the same time the country was achieving the highest rate of growth (2.7%) of per capita GDP of any of the countries. Japanese policymakers have long professed their commitment to growth and full employment—when necessary, at the expense of corporate profitability—and this commitment is reflected in the negative dividend growth and, until 1994, a ban on corporate repurchases of stock. In this sense, Japanese companies' reluctance to pay out corporate cash reflects what has amounted to a national policy goal of using corporate assets to preserve growth and employment. But, as policymakers have begun to recognize, the shareholder losses resulting from this pursuit of growth *at all cost* have arguably played a major role in the country's relatively poor economic performance since 1990.

But what happens if we focus on a shorter, and more recent, time period? Table 2 reports the mean geometric real returns and growth rates of real per capita GDP for the period 1970-2011, with Austria and Singapore added to the 19 countries used in Table 1. Over the 42 years since 1970, the correlation between per capita GDP growth and real stock returns has been essentially zero for these countries, whether returns are measured in local currencies or U.S. dollars.[5]

The findings summarized thus far apply to mainly developed economies. What about developing economies?

Table 3 reports, and Figure 2 shows, for the more recent period 1988-2011, the mean geometric real return and the mean growth rate of real per capita GDP for 15 countries

5. Dimson, Marsh, and Staunton (2005, Chapter 3, Chart 31) also show that, for some combinations of countries and time periods, the correlation of real per capita GDP growth and real equity returns has been zero or even positive. Dimson, Marsh, and Staunton (2010) also report that the negative correlation between stock returns and economic growth becomes positive if we use *total* GDP growth instead of per capita GDP growth. As a matter of arithmetic, this change reflects the tendency of some countries with high stock returns to have high population growth rates. Most notable is South Africa, which has a higher birth rate than that of any of the other countries listed, as well as substantial immigration from neighboring African countries with a lower standard of living (and, in the case of Mozambique, prolonged civil wars). Because people tend to move *from* poor countries *to* richer countries, and people in richer countries tend to have lower birth rates, the population growth rates are causally related to the level of real incomes at the end of the sample period. (Table A-1 in the Appendix reports the cumulative and per annum population growth over 1900-2011 for the 19 countries used in Table 1.)

Table 2 **Real Per Capita GDP Growth Rates and Stock Returns for 21 Countries, 1970-2011**

Country	Mean geometric real per capita GDP growth	Mean geometric real return	
		Local currency	U.S. dollars
Australia	1.8%	3.6%	4.7%
Austria	2.3%	2.3%	3.5%
Belgium	2.0%	5.4%	6.2%
Canada	1.7%	5.3%	5.4%
Denmark	1.5%	6.8%	8.0%
Finland	2.4%	7.9%	8.5%
France	1.8%	4.6%	5.1%
Germany	1.7%	5.8%	4.9%
Ireland	3.3%	3.1%	4.2%
Italy	1.8%	0.3%	0.7%
Japan	2.0%	2.3%	4.6%
Netherlands	1.9%	6.2%	7.2%
New Zealand	1.2%	4.1%	4.9%
Norway	2.4%	5.6%	6.7%
Singapore	5.1%	5.9%	6.6%
South Africa	0.6%	6.9%	6.3%
Spain	2.0%	2.9%	4.5%
Sweden	1.8%	8.8%	8.8%
Switzerland	1.0%	4.6%	6.7%
United Kingdom	2.0%	4.9%	5.6%
United States	1.7%	4.9%	4.9%
Correlation of real growth and real returns		-0.04	0.01
p-value		(0.87)	(0.95)

Geometric mean real annual GDP per capita growth rates (using constant local currency units) for the 42 years from 1970-2011 come from the *World Bank's World Development Indicators* (WDI). Geometric mean real annual stock returns come from Datastream, where the MSCI total return indices with dividends reinvested are used. Inflation adjustments for stock returns are made using December to December changes in the CPI. The mean real return is 4.9% per year in local currencies and 5.6% per year in U.S. dollars and the mean real per capita GDP growth rate is 2.0% per year.

that, 24 years ago in 1988, were generally viewed as emerging markets. The group includes the four BRIC countries, even though for these cases the MSCI stock return series start later than 1988. In fact, China and Russia did not even have stock markets in 1988; and almost no one predicted the fall of the Berlin Wall a year later and the collapse of the Soviet Union. For these 15 countries, the correlation is -0.41 (p=0.13) in local currency units and -0.47 (p=0.08) in U.S. dollars.

In China, the combination of high economic growth (over 9% on average) with low stock returns (-5.5% per year) is especially notable, particularly considering the fact that China's stock market grew from almost nothing in 1993 to a market value of approximately $3 trillion at the end of 2011. Much of the growth in China's aggregate market cap is attributable to the expansion of the number of listed companies, resulting in part from several thousand initial public offerings (IPOs), including those of China's four largest state-owned banks.

Economic Growth and Stock Returns

What might explain this negative correlation between real stock returns and real per capita GDP growth?

One possibility is that part of the negative correlation reflects the tendency of investors to build expectations for high growth into prices at the start of the period. This is a major reason why the returns on Chinese stocks during the period 1993-2011 were so low (again, -5.5%). At various times since 1993, the price-earnings (P/E) multiples of Chinese company stocks reached extraordinary levels, followed by earnings disappointments and low reported returns on capital. When one uses 112 years of data, however, the effects of such anticipation on average realized returns should be fairly modest. For example, even if the stock price multiples at the beginning (1900) were twice as high in one country as another, the compounded average annual return would have been reduced by only about 0.6% per year.[6]

But that said, I think there is a general tendency for

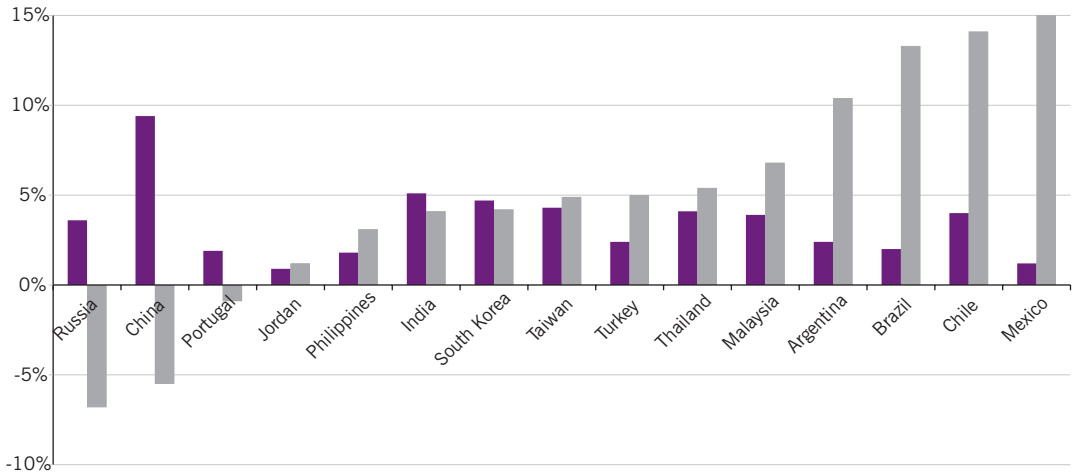
6. $1.006^{112} = 1.954$, or approximately 2. If country A and country B both give stock market investors terminal inflation-adjusted wealth of 100 (capital gains plus reinvested dividends) at the end of 2011, but in 1900 country A required an investment of 2 and country B required an investment of 1, the compounded annual returns are, respectively, 3.6% per year for country A and 4.2% per year for country B, a difference of 0.6% per year.

Table 3 **Real Stock Returns and Per Capita GDP Growth for 15 Countries for (up to) 24 years**

Country	Years	Mean geometric real per capita GDP growth	Mean geometric real return	
			Local currency	U.S. dollars
Argentina	1988-2011	2.4%	10.4%	12.9%
Brazil	1993-2011	2.0%	13.3%	10.7%
Chile	1988-2011	4.0%	14.1%	15.2%
China	1993-2011	9.4%	-5.5%	-5.7%
India	1993-2011	5.1%	4.1%	4.1%
Jordan	1988-2011	0.9%	1.2%	0.3%
Malaysia	1988-2011	3.9%	6.8%	5.9%
Mexico	1988-2011	1.2%	15.0%	17.1%
Philippines	1988-2011	1.8%	3.1%	4.3%
Portugal	1988-2011	1.9%	-0.9%	0.0%
Russia	1995-2011	3.6%	-6.8%	-2.2%
South Korea	1988-2011	4.7%	4.2%	4.1%
Taiwan	1988-2011	4.3%	4.9%	2.8%
Thailand	1988-2011	4.1%	5.4%	5.2%
Turkey	1988-2011	2.4%	5.0%	6.9%
Correlation of real growth and real returns			-0.41	-0.47
p-value			(0.13)	(0.08)

For real per capita income, the average level of the price level in a year is used to convert nominal GDP to real GDP. Geometric mean annual real GDP per capita growth rates (using constant local currency units) come from WDI. Stock returns come from Datastream, where the Morgan Stanley Capital International (MSCI) total return indices with dividends being reinvested are used with CPI deflators from the World Bank's World Development Indicators (WDI). For annual real returns, inflation is measured from December to December. Returns for the BRIC countries (Brazil, Russia, India, and China) start after 1988 and their per capita real GDP growth rate is computed for the same years as for the stock returns.

Figure 2



Real per capita GDP growth rate per annum (on left in purple) and real equity return per annum (on right, in gray), 1988-2011. The real return data (dividends plus capital gains, adjusted for inflation, in local currency units) are from MSCI (2012). Real per capita GDP growth rates are from the World Bank. For the BRIC countries of Brazil, Russia, India, and China, the numbers start in 1993 or 1995 rather than 1988.

markets to assign higher P/E and price-to-dividend multiples when economic growth is expected to be high, which in turn means that companies must produce higher growth in earnings per share and dividends per share to meet investors' expectations and justify the current price. Unless companies achieve these increases by investing in positive-NPV projects, the higher prices paid will have the effect of reducing realized returns because more capital must be committed by investors to receive the same level of earnings and dividends.

Now, it's true that if earnings and dividend growth eventually turn out to be as high as expected, then overall shareholder returns will not be affected. But a variety of studies have reported that, when the dividend yields of U.S. companies are below their historical average, the growth rate

of future dividends per share generally turns out to be lower, not higher, than the historical average growth rate.[7]

A second explanation for the negative correlation—one offered by Jeremy Siegel in his book *Stocks for the Long Run*—centers on the reality that, in many countries, the biggest publicly traded companies are multinationals that earn some or most of their earnings abroad. For example, the Finnish company Nokia sells only a small percentage of its products in Finland. International operations could plausibly lower the correlation between per capita GDP growth and stock returns. On the other hand, it is hard to see how international operations would cause a *negative* correlation.

The third explanation for the negative correlation between per capita GDP growth and stock returns—and in my view the most important—begins with the recognition that stock returns are determined not by growth in economy-wide earnings, but by improvement in measures of firm-specific corporate performance, such as growth in earnings *per share* and return on equity, that reflect *the amount of equity capital contributed by investors and the efficiency with which such capital is used*.

To make this point more clear, let's turn to the case of the U.S., where companies have returned large amounts of capital to investors through a combination of dividends and stock buybacks. During the period 1900-2011, the average earnings yield for U.S. companies has been just under 7%. At the same time, the average dividend yield has been about 4.2%. These two figures together imply that U.S. companies have reinvested cash flows that have annually averaged about 2.8% of their current market cap, which in turn suggests that the real growth rate of dividends per share should have been about 2.8%. At first glance, it seems puzzling that real dividends per share have not grown faster than the 1.3% per year reported in Table 1, unless companies on average have been consistently investing in negative NPV investments.

But this apparent puzzle disappears if we also take into account a bias in the inflation adjustments and two tendencies of U.S. companies: (1) large grants of employee stock options, especially among technology companies beginning in the 1980s; and (2) large payouts of corporate cash in cash-financed takeovers, beginning in the 1960s.

Quantitatively, the most important reason that the measured growth rate of real dividends per share is only 1.3% is because the inflation rate is overestimated by about 1% per year, which means that the true growth rate of real dividends per share has been about 2.3%.[8] Thus, the true discrepancy, once inflation is correctly measured, is between a 2.8% reinvestment rate and a 2.3% growth rate of real dividends per share.

The two tendencies of U.S. corporations that affect per share growth account for the rest of the discrepancy. The exercise of employee stock options has the effect of slowing the growth rate of real dividends per share by expanding the number of shares, and thereby diluting both EPS and dividends per share. Quantitatively, the bias is probably about 0.1% per year over the entire 1900-2011 period, since employee stock options were not common prior to the 1980s.[9]

In addition to paying out cash dividends, U.S. corporations have paid out large amounts of cash to shareholders by repurchasing shares.[10] The reduction in the number of shares outstanding affects the growth rate of dividends per share, so these share repurchases have already been accounted for in the growth rate of real dividends per share. But the dividend yield underestimates the average cash distribution to shareholders relative to the market value of equity for another reason. Cash used by one company to acquire another publicly traded company is equivalent to a share repurchase in distributing cash, but it doesn't affect the number of shares outstanding of the acquiring company. A cash-financed acquisition is merely using company A's cash to retire company B's shares.

In the last 50 years, a large amount of cash has been distributed in this manner. And over the entire 112-year sample period, cash-financed acquisitions per year probably average about 0.4% of the market value of equities. After adjusting for the effects of the understatement of inflation, employee stock option dilution, and cash-financed takeovers on cash payouts, the entire gap between the reported 1.3% growth rate of real dividends per share and the 2.8% reinvestment rate is accounted for.

Why are such distributions of capital important in explaining the high returns of U.S. companies? As noted earlier, the executives of public companies in all countries face political and social pressure to maintain or pursue corporate growth, even in cases where such growth is likely to produce less than competitive returns and reduce market values. Especially for large, established companies that are generating far more operating cash flow than they can profitably reinvest—think about GE or IBM—large annual corporate distributions in the form of dividends and stock repurchases play a critically important corporate governance function by helping managers to resist such pressures for growth.[11] Although often criticized

7. See John Campbell and Robert Shiller "Valuation Ratios and the Long-run Stock Market Outlook: An Update" (2001) and Robert Arnott and Clifford Asness "Surprise! Higher Dividends = Higher Earnings Growth," *Financial Analysts Journal* (2003).

8. *Toward A More Accurate Measure of the Cost of Living* (1996), also known as the Boskin Commission report, concludes that the CPI overstated U.S. inflation by about 1.3% per year from 1978–1996, with a smaller bias prior to 1978. Adjustments to the CPI computation made as a result of the report have reduced the bias since then, so that the average bias since 1900 is about 1.0% per year. An upward bias in the U.S. inflation rate implies that the average annual real return on U.S. stocks in Table 1 of 6.2% is also biased downwards. When real returns are measured in U.S. dollars, all countries would have an identical bias in their real returns, so the correlation of -0.32 reported in Table 1 would be unchanged.

9. Another way of thinking about such dilution is that, until the accounting rules were changed in 2002, U.S. companies that granted employee stock options were overstating their earnings because the employee stock options were not expensed.

10. Starting in 1984, U.S. companies began to pay out a substantial portion of earnings in the form of share repurchases. For evidence on the time series of aggregate cash payouts in the form of both dividends and share repurchases, see Harry DeAngelo, Linda DeAngelo, and Douglas J. Skinner, "Corporate Payout Policy," *Foundations and Trends in Finance* (2008).

in the popular business press as admissions of failure to find investment opportunities, such distributions of excess corporate cash and capital effectively force the managements of such companies to put the reinvestment decision back in the hands of their investors.[12] Without such payout policies, many companies have wasted massive amounts of investor capital in misguided attempts to maintain sales in declining businesses or get into unfamiliar ones. Think about corporate Japan, or the recent experience of companies like Eastman Kodak, the camera and film manufacturer whose business was decimated by digital photography and the replacement of cameras by smartphones.

In addition to the political and social pressures, there is a behavioral explanation of corporate managers' bias toward excessive retention and overinvestment, including overinvestment in acquisitions. Both successful—and unsuccessful—entrepreneurs and top corporate executives tend to be overly optimistic and confident about their own abilities. Managers who are prone to such excessive optimism are inclined to overinvest—that is, to take on projects that fail to earn their cost of capital—because of their habitual or instinctive tendency to emphasize what can go right while downplaying potential downsides.[13]

In sum, although higher capital investment by companies generally means higher growth rates for national economies (at least over the near term), it is by no means a reliable prescription for higher returns to shareholders over the longer term. In the U.S., for example, some industries have consistently invested in negative NPV projects, causing significant losses for their shareholders. Industries that have experienced remarkable growth during the last century include airlines, automobiles, computer hardware and software, and pharmaceuticals. At the same time, industries such as railroads, steel, and tobacco have declined sharply in relative importance. But the shareholders of airlines have not gotten rich, nor have the owners of auto companies during the last 45 years. Instead, investors in these industries have seen many billions of dollars wasted in value-destroying negative-NPV projects. Tobacco companies, on the other hand, have done very well for their shareholders, despite hundreds of billions of dollars paid out to settle lawsuits, in part by paying out large fractions of their still considerable operating cash flows in the form of dividends.

But perhaps the most compelling evidence of the importance of corporate payout policy comes from what was once the largest of U.S. industries in terms of market value. At the beginning of 1900, railroads made up 63% of the market cap of U.S. stocks—a number that, by 2002, had fallen to less than 0.2% of the total U.S. market cap.[14] Much as happened in the U.S. auto, steel, and airline industries, after initial periods of growth and profitability, the returns on massive amounts of capital that were reinvested (instead of being paid out) by U.S. railroads later proved to be disappointingly low or even negative, destroying large amounts of shareholder value.

The Sources of Economic Growth

There is a huge literature on the determinants of economic growth. Although this article will not attempt to do more than sketch the broad outlines of this work, in so doing I will try to emphasize the connection, or lack thereof, between the determinants of growth and stock returns.

Simply put, economic growth results mainly from increases in three main inputs: labor, capital, and technology. The efficiency with which these inputs are used also matters, and such efficiency is affected by a nation's culture, institutions, and government policy.

Increases in labor inputs come from increases in the general population, in the fraction of the population that is able and willing to work, and in the human capital of the workforce. In almost all developed and developing countries, the non-agricultural labor force has become a larger fraction of the population over time as the adult children of what was once the largest class of workers, subsistence farmers, have moved to urban areas and taken manufacturing and service jobs. In much of Europe and its offshoots of Australia, Canada, New Zealand, and the U.S., this transition took place very gradually. In East Asia, by contrast, this transition has been occurring with remarkable speed, providing a major impetus to growth.

Another source of increased labor is, somewhat paradoxically, the drop in birth rates that has been taking place in most of the world. The paradox of a decline in birth rates leading to higher labor force growth is attributable to two effects. Most obviously, lower birth rates provide an opportunity for women who might otherwise be caring for children to enter the paid work force. Less obviously, the large numbers of children who were born when birth rates were still high enter the labor force 20 years later, but do not retire for another 40 years. Starting 20 years after birth rates have started to fall, there are both relatively few retirees and relatively few

11. Another reason that GDP growth does not necessarily translate into high returns for minority stockholders, with particular relevance for countries outside the U.S., is that managers may expropriate profits through sweetheart deals, tunneling, and other ruses. There is a large literature focusing on this, but most of its emphasis has been on how corporate governance problems would keep public equity markets from becoming large. The assumption is that minority investors would correctly evaluate in advance the chance of receiving future dividends, and if the legal and institutional mechanisms are weak, firms would be unable to sell equity to the public at terms that are attractive enough to make it an optimal financing/ownership mechanism. This assumes that investors price protect themselves. If investors do not price protect themselves, then it is possible that public equity markets would be bigger than otherwise, but that realized returns would be low because profits would accrue to managers rather than minority shareholders.

12. One particularly instructive example of the importance of such distributions are energy master limited partnerships, which routinely pay out as much as 90% of their operating cash flow, only to get most of that capital back through follow-on equity offerings. During the 30 months from mid-2008 through 2010, energy MLPs paid out an estimated $18 billion to their unitholders while raising $16 billion in follow-on offerings—and from essentially *the same* group of investors.

13. See J.B. Heaton, "Managerial Optimism and Corporate Finance," *Financial Management* (Summer 2002).

14. According to Dimson, Marsh, and Staunton, *Triumph of the Optimists* (2002).

children, thus making the fraction of the population in their prime working years unusually high for a period of about 40 years. In cases where the drop in birth rates takes place suddenly, as has happened in many East Asian countries, this "demographic dividend" has supercharged growth rates.

Yet another source of increased labor inputs is increased human capital per worker. An increase in human capital can result from improvements in health, but the more important source of increase has been through increased levels of education. Not all education is the same, of course. It is widely believed, for example, that engineering and technical education has a positive effect on economic growth, while the effect of adding to the supply of lawyers in the United States is less clear.

Along with increased inputs of labor, infusions of new capital and the associated increases in capital per worker can also lead to higher economic growth. Although capital can be accumulated in a number of different ways, the most fundamental source is the savings of individuals. Apart from amounts invested in housing or small private enterprises, such savings tend to be channeled into an economy through two main conduits: (1) governments, particularly through financial institutions that are owned or controlled by the public sector; and (2) private-sector banks and corporations, which increase their own capital and investment through the issuance of new securities and/or the retention and reinvestment of earnings.

In analyzing differences in economic growth rates, it's useful to start by looking at the well-known critiques of Asia's economic miracle by Paul Krugman and Alwyn Young.[15] In their widely cited articles, Krugman and Young argue that the high growth rates achieved by the Soviet Union during the period 1930-1970, and by many East Asian countries from 1960-1993, resulted mainly from taking economies with vast supplies of under-utilized labor but very little capital, and then bringing together capital (from high savings rates) and labor (by moving people out of subsistence agriculture) in combination with mainly imported technology. While this transition was occurring, these economies experienced exceptionally high rates of economic growth, bolstered by the demographic dividend that is partly responsible for China's current high rate of growth.

But while I agree with Krugman and Young that much of the economic growth in emerging markets is attributable to high savings rates (with a modest role for foreign direct investment) and the more efficient use of labor, I want to emphasize that even a continuing increase in the supply of these two inputs—which, as Krugman and Young suggest, is itself a doubtful proposition—is not likely to translate into higher per share profits for the shareholders of their listed companies. As we have already seen, stock returns tend to be high when corporate earnings are reinvested in positive-NPV projects, which results in a high growth rate of dividends per share. If uninterrupted growth is the paramount objective of a national or corporate policy, companies can still grow their top and (even their) bottom lines by reinvesting in negative-NPV projects—and countries can ramp up their growth rates—while inflicting losses on shareholders. But over the longer term, the failure to provide investors with adequate returns on capital is likely to reduce economic growth. Again, think about the case of Japan during the last 20 years.

In addition to increased inputs of capital and labor, economic growth also comes from technological progress, as inputs are transformed into outputs more efficiently. But much of the efficiency benefits of technological change end up accruing not to investors, but to consumers in the form of lower prices and higher-quality products, as competition between companies limits the ability to boost profit margins when costs decline.[16] Let me illustrate this point with two examples: the agricultural industry and the airline industry.

One hundred and fifty years ago, roughly 90% of the labor force in Europe and North America worked in agriculture. Thanks mainly to technological advances (such as improved seeds) and increased capital (synthetic fertilizer, tractors, etc.), agricultural output per farmer has skyrocketed, and today only a few percent of the population in developed countries work in the agriculture sector. But have the owners of farmland gotten rich? The answer is no, or at least not as a result of increases in farming profits rather than government subsidies. The increase in agricultural output has been so vast that the benefits have accrued almost entirely to the consumers of food. Standards of living have improved because of the vast number of workers who now produce output in other sectors of the economy instead of the agricultural sector.

Or think about the effects of technological change on a company in the airline industry, Delta Airlines. Over the last 60 years, improvements in airplanes, such as the replacement of propeller aircraft by jets and more efficient jet engines, have permitted Delta to make dramatic reductions in the inflation-adjusted costs of flying its passengers over long distances. Furthermore, modern computerized airline reservations systems have allowed Delta to charge different passengers different prices for seats on the same flight, a practice known as "yield management," and thereby maximize the average ticket price while also filling a high percentage of seats. If Delta was the only airline with lower costs and higher revenue per passenger, it would be able to boost its profit margins. But since other competing airlines have also benefited from

15. See Paul Krugman, "The Myth of Asia's Economic Miracle," *Foreign Affairs* (1994) and Alwyn Young, "The Tyranny of Numbers: Confronting the Statistical Realities of the East Asian Growth Experience," *Quarterly Journal of Economics* (1995). Krugman's article gives a non-technical summary of Young's research. Because of the difference in the speed of publication between *Foreign Affairs* and the *Quarterly Journal of Economics*, Krugman's article was published first, even though Young's article was written first.

16. For discussions of why technological change does not necessarily benefit shareholders, see Warren Buffett (1999) in *Fortune* and Jeremy Siegel (2000) in the *Wall Street Journal*.

improved technology, competition has driven down the average ticket price, and Delta's shareholders have not earned high returns. Indeed, Delta has joined Air Canada, United, US Airways, American, Continental, TWA, Pan Am, defunct Belgian carrier Sabena, and countless other airlines around the world in declaring bankruptcy one or more times.

Predicting Future Returns

In general, there is no consensus about how to estimate future stock returns. This is especially true for emerging markets, where frequently there are only limited data on past stock returns. Limited historical information on stock returns is not a constraint, however, since such data are irrelevant for estimating future returns, whether in emerging markets or developed countries. For estimating future returns, forward-looking information is needed. This point has been made before, although possibly not as explicitly, by Jeremy Siegel (in his 2002 book) and by Gene Fama and Ken French, among others.[17] Here I go one step farther and argue that knowledge of the future real growth rate for an economy, even if knowable in advance, is also largely irrelevant. My argument thus suggests that whether the Chinese economy ends up growing by 7% per year, or by 3% per year, for the foreseeable future is unimportant for the future returns on Chinese stocks.

In what follows, I argue that one needs only four pieces of information to estimate future equity returns. The first is the current P/E ratio, although earnings must be smoothed to adjust for business cycle fluctuations. The second is the fraction of corporate profits that will be paid out to shareholders in the form of share repurchases and dividends. The third is the return on capital for the reinvested earnings. As already noted, if the money is invested in positive-NPV projects, a high P/E ratio can be justified. The fourth is the probability of catastrophic loss—that is, the chance that "normal" profits are an upwardly biased measure of expected profits because of "tail risks" stemming from the possibility of low-probability, large-loss events.

To see why future economic growth is largely irrelevant to predicting stock returns in an economy, it helps to start by recognizing that investors realize returns only on the shares that they hold, not on shares that may later be issued by the same companies to other investors. And this in turn implies that the returns on existing shares will be abnormally high only if a corporation's earnings are reinvested in projects with higher returns than the market had expected. Part of an economy's growth, as we have already seen, can be attributed to savings invested in new companies, and to the issuance of new securities by existing companies. But the gains on this capital investment do not necessarily accrue to today's shareholders.

In the short run, of course, there is ample evidence that unexpected changes in economic growth affect stock prices. Stock prices fall when the probability of an economic recession increases, and prices rise when the probability of economic recovery increases. Recessions are definitely bad for corporate profitability, and cyclical recoveries are good. But while such cyclical effects clearly have an effect on equity valuations, the effects should be largely transitory, mainly because they typically do not have a big impact on the present value of the earnings and dividends of a given company.[18]

What about the possibility that today's stock prices are depressed by general concern that a catastrophic event may wipe out a country's financial markets? This would show up in both a high promised yield on bonds, and depressed P/E ratios. In this scenario, the earnings yield on stocks will overestimate future expected equity returns for the same reason that the yield to maturity on corporate bonds overestimates the expected return. In both cases, there is a "default" probability, and the expected returns are lower than the "promised" returns.

This is a reasonable characterization, at least in hindsight, of how stock and bond returns looked to many (if not most) investors during the panic of 2008. But now let's move to today's market conditions, with the S&P 500 around 1400 and the Dow over 13,000. If past stock returns are irrelevant for predicting future stock returns, and future economic growth rates are also irrelevant, what is likely to matter?

The answer is fairly straightforward: earnings yields. Following Jeremy Siegel and using a formula that has become known as the "Shiller earnings yield," one can forecast future compounded real stock returns as follows: $E(r) = E^*/P$, where E^* is *normalized* earnings per share (that is, EPS smoothed to take out business cycle effects).[19]

As we have already discussed at some length, corporate earnings can either be paid out or reinvested (in capital investments or acquisitions). But as long as we assume that companies earn their required rate of return on reinvested capital, the compounded real return will not be affected by whether earnings are paid out or reinvested.

Of course, P/E ratios fluctuate all the time, and such fluctuations can be attributed to changes in either the numerator or the denominator. Since current earnings fluctuate based on business cycle effects, a market P/E could be temporarily high because earnings are temporarily depressed. This is why Siegel recommends the use of "smoothed" estimates of earnings that try to remove the effects of the business cycle.

In a 2001 study, John Campbell and Robert Shiller use

17. See Eugene Fama and Kenneth French "The Equity Premium," *Journal of Finance* (2002).

18. I believe that the large stock price effects associated with recessions are partly due to increases in risk aversion at the bottom of a recession, but also partly due to an irrational overreaction. During the 2008 financial panic, for example, drops in stock prices can be attributed to three factors: (1) lower expected cash flows, due to an increase in the possibility of a worldwide depression; (2) higher risk, due to a higher probability of extreme scenarios, and (3) greater risk aversion, which corresponds to a higher market price per unit of risk. The third point results in higher expected returns on a point-forward basis. Irrational overreaction would occur if cash flow forecasts became excessively pessimistic or perceptions of risk were higher than objectively justified. Overreaction results in excessive volatility and mean reversion over multi-year horizons.

19. See Jeremy Siegel, *Stocks for the Long Run* (2008, Chapter 7).

a 10-year moving average of earnings on the S&P 500 to smooth out the effects of the business cycle.[20] Dividing this moving average of earnings by the current level of the S&P 500 index provides what has come to be known as the Shiller earnings yield on the market. Campbell and Shiller report finding that when smoothed earnings yields are lower than historical averages (i.e., when P/E ratios are high), future returns also tend be lower than average. In other words, P/E ratios tend to revert toward a mean, but more often than not through changes in price rather than changes in earnings.

Conclusion

Over long periods of time, the cross-country correlation of per capita real GDP growth and real stock returns has been negative. This pattern has been true for both developed countries and emerging markets, and whether returns are measured in local currencies or U.S. dollars. While historical performance, as the saying goes, is no guarantee of future returns, the evidence flies in the face of the intuition that economic growth should benefit stockholders.

The most plausible explanation of this finding is that consumers and workers are the primary beneficiaries of economic growth, and not the shareholders of existing companies. This finding, however, does not mean that companies should not aim for continuous improvement in their technology and, indeed, all aspects of their business. If the competition is becoming more efficient, failing to keep up with competitors will result in lower profits.

But for corporate managements, the key to adding value is investing operating cash flow in all available positive-NPV projects, while *at the same time* returning any excess cash and capital to investors through dividends and stock repurchases. A rapidly growing economy may result in a tendency for companies to overinvest, perhaps out of a fear of losing market share. As ample evidence from the corporate finance literature suggests, this kind of overinvestment—and the temporary economic growth it produces—does not benefit the shareholders of the existing companies.

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20. Robert Shiller's website maintains an updated Excel file with the smoothed earnings yield on the S&P 500 index.

Appendix **Table A-1 Levels and Growth Rate of Per Capita GDP for 19 Countries, 1900-2011**

Country	Real per capita GDP, $1990			Population in 1900, m	Population growth	
	1900	2011	Per annum		Cumulative	Per annum
United Kingdom	4,492	22,866	1.48%	38.000	65%	0.45%
New Zealand	4,298	18,000	1.30%	0.967	357%	1.38%
United States	4,091	30,755	1.85%	76.212	309%	1.28%
Australia	4,013	25,406	1.68%	4.000	467%	1.57%
Switzerland	3,833	24,985	1.70%	3.525	124%	0.73%
Belgium	3,731	23,309	1.66%	6.136	79%	0.52%
Netherlands	3,424	24,131	1.78%	5.616	197%	0.99%
Denmark	3,017	23,377	1.86%	2.182	157%	0.86%
Germany	2,985	21,175	1.78%	56.000	46%	0.34%
Canada	2,911	25,104	1.96%	5.500	527%	1.66%
France	2,876	21,891	1.85%	41.000	54%	0.39%
Ireland	2,736	25,304	2.30%	4.466	3%	0.03%
Sweden	2,209	24,941	2.21%	5.140	83%	0.54%
Norway	1,877	27,560	2.45%	2.240	123%	0.72%
Spain	1,786	18,808	2.14%	20.750	123%	0.72%
Italy	1,785	18,940	2.15%	33.000	84%	0.55%
Finland	1,668	23,449	2.41%	2.656	103%	0.64%
South Africa	1,602	4,830	1.13%	5.014	907%	2.10%
Japan	1,180	22,333	2.69%	42.000	205%	1.01%

Sources: For the real per capita GDP numbers, "Statistics on World Population, GDP and Per Capital GDP, AD 1-2008" (horizontal file, copyright Angus Maddison, University of Groningen) available at http://www.ggdc.net/maddison/oriindex.htm, in 1990 international Geary-Khamis (purchasing power parity-adjusted) dollars. Ireland and South Africa have 1913 numbers rather than 1900 numbers for real per capita GDP, so the per annum growth rate of real GDP per capita is computed by taking the 98th root of the 2011/1913 ratio. The 2011 numbers come from taking the 2008 Maddison numbers and multiplying by the ratio of 2011 to 2008 real GDP per capita in local currency unit numbers from the World Bank. For Finland and New Zealand, tradingeconomics.com is the source of the 2011 real per capita GDP numbers relative to 2008.

Population in 1900 is given in millions, with 1900 populations from http://en.wikipedia.org/wiki/List_of_countries_by_population_in_1900 except for South Africa, Finland, France, and Ireland. The Irish population is from www.libraryireland.com, which gives a U.K population of 41.150 million in 1900. The Finnish population is from http://www.vaestoliitto.fi/@Bin/236655/YB+09_Statistics.pdf for 1900. The French population in 1900 is given as 38 million by Wikipedia but 41 million at http://www.worldmapper.org/posters/worldmapper_map9_ver5.pdf.

http://en.wikipedia.org/wiki/South_Africa gives a South African population of 5.014 million. 2011 populations are from the Population Reference Bureau at http://www.prb.org/pdf11/2011population-data-sheet_eng.pdf .

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