The Enigma of Investing

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Most investors agree that return and risk are related, but the full implications of that relationship are not always appreciated. The conventional wisdom on investing can be wrong when it is not based on key principles of how capital markets actually work. Without the right analytical framework, surprising investment enigmas emerge. But these enigmas are solved when one recognizes the role of risk in highly competitive capital markets.

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We present two enigmas that debunk accepted notions on stock and bond returns to remind investors that they are compensated for passively bearing diversified risk. The first is the enigma of Federal Reserve (Fed) policy and bond market returns. Investors spend enormous time and resources monitoring, analyzing, and forecasting the Fed's monetary policy. The premise is that Fed policy affects market interest rates, and changes in market interest rates affect bond returns. But is this relationship empirically true?

The second is the enigma of economic growth and stock market returns. Investors spend enormous resources forecasting gross domestic product (GDP) growth. Intuitively, higher GDP growth should translate to higher company earnings, which in turn should result in higher equity returns. But is this relationship true? And if not, what drives stock and bond returns?

The Enigma of Fed Policy and Bond Market Returns

The Fed's primary tool to affect interest rates is the federal funds rate, which is the interest rate banks charge each other on overnight loans to meet reserve requirements. The target federal funds rate is the policy rate that the Fed attempts to achieve, supported by open market operations. We use the target federal funds rate as our proxy for Fed policy.

It generally is accepted that the Fed influences short-term interest rates through the target federal funds rate. But there remains debate among economists as to whether Fed policy also influences longer-term interest rates. On average, investors own the market portfolio of bonds across all maturities and qualities, which, in aggregate, offers the market rate of interest. So it is the market rate of interest that should matter most to investors who contemplate Fed policy. The Bloomberg Barclays U.S. Aggregate Bond Index (BB Aggregate) is the standard index for the investment-grade U.S. bond market, and we use the yield and total return of this index as our proxies for bond market interest rates and bond market returns.

Does Fed policy affect bond market interest rates? Starting in 1990, the Fed began providing public notice on the day it changed its target rate. We tested the relationship between the target federal funds rate and the yield on the BB Aggregate, focusing on the 75 months between 1990 and 2016 with changes in the target federal funds rate—that is, changes in Fed policy. There is a clear relationship. The explained variation (R^2) is 71 percent, and the relationship is statistically significant. In other words, the level of market interest rates is related to the level of target federal funds rates for the months with changes in Fed policy. But correlation is not necessarily causation. Is Fed policy driving market interest rates, or is the Fed merely tracking with the general level of market interest rates?

We can more directly investigate the effect of Fed action by testing the relationship between changes in the target federal funds rate and changes in the market interest rate over the gaps in time between changes in Fed policy. We find a statistically significant but very weak relationship, with an R^2 of just 16 percent. The effect is present and in the right direction, but it is small and far outweighed by more powerful market forces. This result suggests Fed policy is largely tracking with the general level of market interest rates over time, rather than driving them by its actions.

Although economists are interested in the relationship between Fed policy and market interest rates, investors often are more focused on the effect of Fed policy on bond market returns. We already showed a weak relationship between Fed policy actions and changes in market interest rates. We next test if there is a relationship between changes in the target federal funds rate and bond market returns during the months with changes in Fed policy. Again we find a

statistically significant but very weak relationship, with an R^2 of just 11 percent.[1] The effect is present and directionally consistent with an unexpected increase (decrease) in interest rates reducing (increasing) bond returns. But the effect is very small and far outweighed by more powerful market forces (see figure 1).

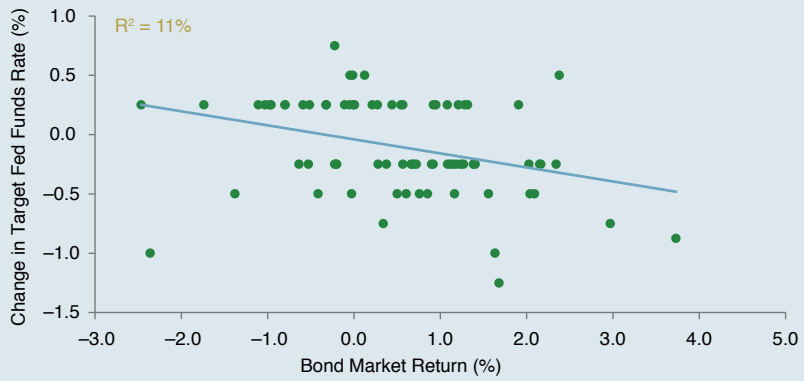
The results show that the bond market does a very good job of anticipating different levels of future interest rates and pricing them into current expected bond returns. The bond market is a forward-looking and highly competitive pricing engine, constantly adapting to new expectations and information. When changes in interest rates are largely anticipated, bond market returns are mostly unaffected. This is because the yield-to-maturity is not earned equally each year but through the compounding of different period returns (forward rates), which capture the term structure of current and expected future interest rates.

What are the market forces that largely explain bond returns? Systematic risk factors are aggregate, diversified risks. Risk factors explain the compensated portion of a diversified portfolio's return and risk. Researchers have found that at least five systematic risk factors explain bond and stock returns.[2] For bonds, these include a portfolio's sensitivity to interest-rate risk (term factor) and to equity-like default risk (default factor). We test the relationship between the monthly returns of the BB Aggregate against term and default risk factors during the months with changes in Fed policy. We find a strong relationship between systematic risk and bond market returns, with an R^2 of 96 percent.

The Enigma of Economic Growth and Stock Market Returns

Dimson et al. (2002) studied the relationship between long-term stock market returns and long-term GDP growth.[3] Their sample included a cross-section of 21 countries with equity return and GDP growth data from 1900 to 2013. Fifteen of the 21 countries were in Europe, so the sample largely represented a similar economic history.

Figure 1: Changes in Fed Policy and Bond Market Returns



Sources: Northern Trust Research, Federal Reserve, Morningstar

Figure 2: Long-Term Real GDP Growth and Real Stock Market Returns

Sources: Northern Trust Research, Morningstar, World Bank

Dimson et al. (2002) found a modest negative correlation between real (inflation-adjusted) equity returns and per capita GDP growth, and they found a modest positive correlation between real equity returns and aggregate GDP growth. The results were mixed and the evidence linking equity returns to GDP growth was weak, surprising many investors and economists.

We take a closer look at the relationship between GDP growth and equity returns by studying a broader and more contemporary sample of countries. Our sample begins with the MSCI All Country World Index (ACWI), a standard proxy for the global equity market. It includes 23 developed-market and 23 emerging-market countries as of 2016. After eliminating countries for which either equity returns or GDP growth information is not available, we are left with a final sample of 43 countries with equity returns and GDP growth covering 1995 to 2015.[4]

We first repeat the Dimson et al. (2002) test comparing long-term real equity returns and long-term real aggregate GDP growth but use our broader and more contemporary sample. We find no relationship between long-term real equity returns and real GDP growth, the R^2 is effectively zero. Even relative to the Dimson et al. (2002) finding, this is strong evidence of no clear relationship between long-term GDP growth and long-term equity returns (see figure 2).

Although economists are interested in the long-term relationship (or lack thereof) between GDP growth and equity returns, stock market investors often are more focused on year-to-year changes in GDP growth and that relationship to year-to-year changes in equity returns. We employ advanced regression techniques that can handle pooled time-series and cross-sectional data to answer this question. Again we find an R^2 that is effectively zero, indicating that there is no relationship between annual changes in real GDP growth and annual changes in real equity returns.

> *[T]he question to ask is not whether future interest rates or GDP growth will be higher or lower, but whether they will be materially different from what highly competitive capital markets expect.*

If global stock markets are highly competitive and forward-looking, they should foresee future changes in GDP growth. Future GDP is not known or observable today, but competitive markets will discount the expected future state into current prices. When we rerun our test to align annual returns with the following year's GDP growth (thus observing future GDP growth ex-post), we find an R^2 of 25 percent, indicating a moderate positive relationship that is statistically significant. This suggests that current stock market prices already contain information about future GDP growth.

If there is no meaningful relationship between stock market returns and long-term or contemporaneous GDP growth, and stock markets already incorporate future GDP growth into current prices, then what drives stock market returns?

Researchers have found that at least three systematic risk factors explain the majority of equity returns.[5] These include a diversified portfolio's sensitivity to the total stock market (market factor), to small-cap stocks (size factor), and to value stocks (value factor). Additionally, there is evidence for an emerging-markets risk factor.

When we test year-to-year changes in the returns of the four systematic risk factors against year-to-year changes in country returns, we find a meaningful relationship between systematic risk and country return. About two-thirds of a country's annual return variation is explained by these four global risk factors.

Among the returns of individual countries is residual risk not explained by the four risk factors, but that idiosyncratic risk was not compensated with a true (i.e., non-random) return premium for any country—and it is diversifiable. For example, the risk (standard deviation) of the MSCI ACWI over the period was far lower than the average risk of the 43 individual countries, and it was modestly lower than the risk of the MSCI USA (the largest constituent in the MSCI ACWI). There is a reduction in uncompensated idiosyncratic risk as the investor moves from owning individual countries to the diversified, systematic risk of a global equity portfolio.

You Are Compensated for Bearing Diversified Risk

If bond and stock markets are competitive and forward-looking, they already price expected future interest rates and expected future growth, including GDP growth. What is left is compensation above a risk-free return for bearing the systematic risk (uncertainty) that the future will turn out to be materially different than what bond and stock markets anticipate. That risk is higher for stocks than bonds. Investors are compensated on average (but not always) for passively bearing systematic factor risks within a well-diversified portfolio.

Therefore, the question to ask is not whether future interest rates or GDP growth will be higher or lower, but whether they will be materially different from what highly competitive capital markets expect. From this perspective, most investors should stay the course with a strategic asset allocation built from systematic risk factors and aligned with their goals—not just now, but always.

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Endnotes

1. This result supports the notion that the weak effect observed in the prior test on market interest rates is due to Fed action.
2. See Fama and French (1993). We use modified term and default factors defined as Bloomberg Barclays U.S. Treasury minus 30-day Treasury bills and Bloomberg Barclays U.S. Corporate High Yield minus U.S. Treasury.
3. See Dimson et al. (2002) and Credit Suisse Global Investment Returns Yearbook 2014.
4. Qatar and United Arab Emirates were removed due to insufficient equity return data. Taiwan was removed due to insufficient GDP data from the World Bank. The final sample includes all 23 developed-market countries and 20 of the 23 emerging-market countries in the MSCI ACWI.
5. See endnote 2. There are additional equity factors such as momentum, but momentum did not materially alter the results.

References

Dimson, Elroy, Paul Marsh, and Mike Staunton. 2002. *Triumph of the Optimists: 101 Years of Global Investment Returns*. Princeton, NJ: Princeton University Press.

Fama, Eugene F., and Kenneth R. French. 1993. Common Risk Factors in the Returns on Stocks and Bonds. *Journal of Financial Economics* 33, no. 1 (February): 3–56.