

# A Great Moderation, But Global Diversification Is Still A Great Deal

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Do global bonds still offer investors diversification benefits despite the growing integration of the world's major bond markets? At first glance, the high correlation among major bond market yields, both nominal and real, would appear to undermine the case for international diversification. However, the evidence suggests that the benefits of international bond diversification are likely to persist even in a world in which countries are running similar, successful monetary policies and business cycle volatility appears to have waned in a phenomenon sometimes referred to as the 'great moderation'.<sup>1</sup>

In this installment of *Global Perspectives*, I will discuss the factors driving the convergence in the global bond market, the case for international diversification and the evidence suggesting the benefits of global bond investing will persist.

## The Integration of the Global Bond Market

Evidence of the global bond market's integration is all around us. In 2006, government bond yields in the major markets were highly correlated. These tight linkages are also evident in real yields on inflation-indexed bonds issued by most of these countries, which filter out the effects of country-specific inflation differences that are embedded in nominal bond yields.

What is driving this convergence? Important secular forces appear to be at work that are reducing investors' historically strong preference for domestic bonds—known as “home bias”—and encouraging investors to increase international diversification. The most important of these secular forces, and those most likely to endure, are the following:

- A convergence among countries in the goals, inflation-targeting strategies, and average outcomes pursued by their central banks in the conduct of monetary policy;
- A resulting reduction in inflation volatility and thus country-specific inflation risks to international investing;
- A reduction in cross border hedging costs to international diversification associated with greater market liquidity and a closer convergence in short-term interest rates;
- A decrease in the volatility of global growth rates and thus country-specific business cycle and possibly interest rate risk, i.e., the ‘great moderation’.

Some have argued that as the integration of global bond markets has advanced, the gains to international diversification may have diminished. That’s because the original ration-

ale for international diversification was developed in the 1980s and 1990s when (1) countries pursued a wide range of monetary policies resulting in a wide dispersion of inflation rates and inflation volatilities, (2) hedging costs were higher, and (3) the global ‘great moderation’ had yet to occur and/or to be fully incorporated in asset prices. Hence, the same factors that are driving global bond market integration might also be reducing country-specific interest rate risk and thus the potential gains to diversification. To see if this is true, let’s examine the case for international diversification in more detail.

### **The Case for Diversification Across G10 Government Bond Markets**

G10 government bonds have similar risks and react to country-specific macro developments in ways similar to U.S. Treasuries. For example, a rise in inflation or in growth prospects in a country tends to lower bond returns, while ease in monetary policy tends to boost bond returns. Average bond yields can and do differ across countries, but this is because of differences in average inflation and growth rates. However, differences in average

bond yields across countries do not necessarily imply differences in average currency-hedged bond returns. This is because the cost of hedging to a U.S. investor is equal—to a close approximation—to the interest rate differential between the U.S. and the foreign bond market that prevails over the holding period for the bonds. For example, if countries with higher average bond yields also have higher average short-term interest rates (relative to the U.S.) then the cost of hedging currency exposure to invest in these foreign bonds can and often does offset the foreign yield advantage. Thus, on an *ex ante* basis, a portfolio of foreign government bonds hedged back into dollars should be expected to produce roughly the same total return as a portfolio containing U.S. Treasuries. The average hedged return in foreign and U.S. government bonds will not be identical to the extent that home bias by U.S. investors persists (which it does) and U.S. investors are risk averse (which they are).

Now, to some extent there is a common, global component to cross-country business

cycles, and this global component will tend to make bond returns in different countries positively correlated (which they certainly are in practice). But at least historically, not all interest rate changes are a consequence solely of a 'global' business cycle; country-specific factors have been very important. However, if there has in fact been a 'great moderation' in business cycles across the globe, this reduction in business cycle risk around the world will have tended to reduce country-specific interest rate risk, and thus to encourage international diversification. Moreover, as more and more countries run more or less the same style of inflation-targeting monetary policy (with more or less the same targets), this will also tend to encourage international diversification.

### Some Evidence

This reasoning suggests that a currency-hedged, diversified portfolio of government bonds should produce similar average returns to a passively held U.S. Treasury portfolio, but with possibly lower volatility. Volatility will be lower for a currency-hedged portfolio of

government bonds if there is some country-specific return volatility that can be diversified away. To assess the evidence, we look at data on foreign government bond returns hedged back into dollars for the period 1990-2006. We divide the sample roughly in half, looking at a sub-sample of 1990-1998 and 1999-2006. It is interesting to look at the two sub-samples separately for several reasons. For example, the birth of the Euro and of the ECB in 1999 is an important regime change, which might be expected to have altered the risk and return profile to global bond investing. Also, because of the common shocks of a global tech bust and equity sell off, country business cycles of 2000-2002 shared a substantial common component, which might have diminished the gains to international diversification in recent years.

### 1990-1998

We look at data on monthly total returns on U.S. Treasuries (Citigroup U.S. Treasury Index) and a hedged portfolio of foreign government bonds (JP Morgan Government Bonds ex U.S. Hedged). Over the sample

1990-1998, the total return on the Citigroup U.S. Treasury Index was 8.6 percent a year, while the total return on JP Morgan Government Bonds ex U.S. Hedged index was 9.0 percent a year. Thus the average realized excess return on the JP Morgan Index over the Citigroup U.S. Treasury index was about 40 basis points a year between 1990 and 1998.

What about the risks of investing in these two portfolios? The realized volatility of the hedged foreign bond portfolio during 1990-1998 was 3.6 percent per year, while the realized volatility of investing in the Treasury index during this period was 4.3 percent. The lower realized volatility of the foreign bond portfolio resulted from the fact that foreign bond markets were typically (but certainly not always) less volatile than U.S. bond markets. But it also results from the fact that the foreign bond portfolio contains different countries' bonds, so it is already benefiting from diversification.

When comparing risk and reward in finance, it is useful to compute the information ratio

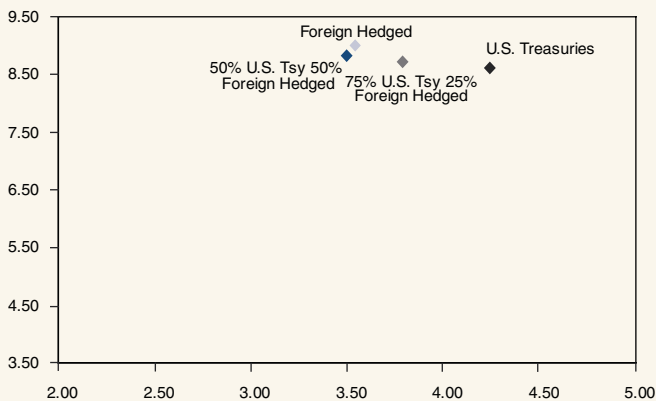
for an investment. The information ratio is just the excess return on an investment over the nominal interest rate divided by the volatility. Over the period 1990–1998, the yield on one-month Libor averaged 5.4 percent. Thus, over the 1990–1998 period, the realized information ratio on the Treasury investment was about 0.7 while the realized information ratio on the investment in the portfolio of foreign bonds was 1. Thus, perhaps because of home bias, U.S. investors on average during 1990-1998 received a somewhat higher return with a somewhat lower volatility by holding a currency-hedged portfolio of foreign government bonds.

Now let’s look at the realized return and risk during 1990-1998 on various blends of U.S. and foreign government bonds.

### Realized Risk and Reward to Global Bond Diversification 1990-1998

A picture is indeed worth a thousand words. During 1990-1998, adding currency-hedged foreign bonds to a portfolio of U.S. Treasuries produced a portfolio with lower volatility but a similar return. Was this fortuitous? Have the secular forces highlighted earlier in this article altered these relationships? In particular, have the gains to international diversification been eliminated by the great moderation and the spread of Taylor rules across the globe? Let’s look at data for the past eight years to find out.

**Realized Risk and Reward to Global Bond Diversification 1990-1998**



SOURCE: JPMorgan, Citigroup, PIMCO

Chart 1

### 1999-2006

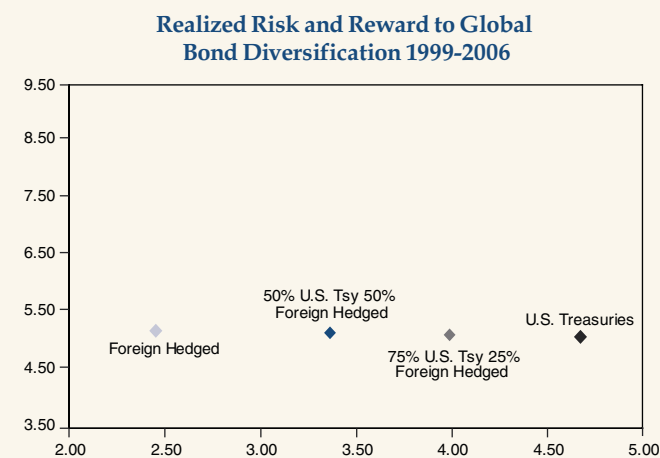
Over the sample 1999–2006, the total return on the Citigroup U.S. Treasury Index was 5.10 percent a year, while the total return on JP Morgan Government Bonds ex U.S. Hedged index was 5.20 percent a year. Thus, between 1999 and 2006, the average realized excess return of the JP Morgan Index over the

Citigroup U.S. Treasury index was shaved down from 40 basis points to 10 basis points a year, perhaps as a result of a fall in home bias.

What about the risks of investing in these two portfolios? The realized volatility of the hedged foreign bond portfolio during 1999-2006 was 2.5 percent per year, while the realized volatility of investing in the Treasury index during this period was 4.7 percent. Thus, while the volatility in the U.S. Treasury returns was approximately the same over 1999-2006 as it was in 1990-1998, the realized volatility of investing in a currency-hedged portfolio of foreign government bonds was substantially lower than in the earlier period. This was no doubt due, at least in part, to EMU and the creation of a Euro-denominated market for European sovereigns.

Over the period 1999–2006, the yield on one-month Libor averaged 3.6 percent and thus the realized information ratio on the Treasury investment fell to 0.3 while the realized information ratio on the investment in the portfolio of foreign bonds fell to 0.6. While home bias

has probably narrowed, realized and most likely *ex ante* information ratios on investing in global government bonds continue to exceed those obtained by limiting one’s investments to Treasuries.



SOURCE: JPMorgan, Citigroup, PIMCO

Chart 2

What about the gains to international diversification? A case can be made either way in theory, but in practice, the data are clear.

### Realized Risk and Reward to Global Bond Diversification 1999-2006

As can be seen from Chart 2, notwithstanding the forces that have tended to increase the linkages in global bond markets and thus lower average returns, risk premiums, and home bias, the gains to international diversifi-

cation during this decade have remained. Although past performance is no guarantee of future returns, two factors suggest these diversification gains will persist for the foreseeable future. First, there remains a significant country-specific component to international business cycles. The estimated “beta” of a particular country’s GDP growth on U.S. GDP growth is usually estimated (with a substantial residual) to be less than 1, to be time varying, and to differ from cycle to cycle. This reflects the reality that local and regional business cycles have been and will likely continue to be important influences on bond returns across different local markets. Second, there have been important differences across countries in their monetary policy reaction functions; e.g. in the parameters of their Taylor rules. The empirical evidence confirms this is the case. Thus, even if countries’ business cycles are tightly correlated, their monetary policies, and thus bond returns, are likely to be less so.

### And So What?

To sum up, producing alpha in global markets is not about ‘buying and holding’ foreign bonds. The evidence presented here shows that average returns over time will tend toward equality between a passive portfolio of Treasuries and a passive portfolio of currency-hedged foreign government bonds. However, precisely because there remain country-specific differences in business cycles and monetary policies that produce a gain to international diversification, these same differences in business cycles and monetary policies will create opportunities to generate risk-adjusted excess returns relative to a country or even global benchmark. In other words, the gains to international diversification remain, as do the opportunities to profit from the factors that create them.

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<sup>1</sup> For recent discussions of the impact of 'the great moderation' and central bank transparency on bond yields and risk premia, see Bill Gross, "Reality Check," *Investment Outlook* December 2006 and Paul McCulley, "Moral Hazard Interruptus," *Global Central Bank Focus* June 2006.

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JPMorgan GBI Global Ex-U.S. Index (US \$ Hedged) is an unmanaged market index representative of the total return performance in U.S. dollars on a hedged basis of non-U.S. bond markets. The Citigroup US Treasury Index is an unmanaged market index comprising of a universe of US Government Treasury securities. It is not possible to invest in an unmanaged index.

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