

# The dynamics among G7 government bond and equity markets and the implications for international capital market diversification

Kenneth L. Smith<sup>a,\*</sup>, Peggy E. Swanson<sup>b,1</sup>

<sup>a</sup> *Department of Economics, Finance, & Banking, Kelce College of Business,  
Pittsburg State University, Pittsburg, KS 66762, USA*

<sup>b</sup> *Department of Finance and Real Estate, College of Business Administration,  
Box 19449, University of Texas at Arlington, Arlington, TX 76019, USA*

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## Abstract

This paper investigates potential international capital market diversification gains from relationships between global government bond and equity markets. Its primary contributions are (1) including both government debt and equity markets in the investigation of global diversification gains, (2) basing the analysis on real, risk-adjusted returns, and (3) evaluating both variance decompositions and impulse responses, as well as long-term relationships for international U.S. dollar investors. We find the cointegration, variance decomposition, and impulse response function results indicate interdependence and reduction in gains to international diversification.

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## 1. Introduction

As a result of increased capital and information flows, an extensive body of research has focused on increased linkages among international stock markets; less research has investigated relationships among world bond markets; and until recently, even less attention has been given to

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\* Corresponding author. Tel.: +1 620 235 4592.

*E-mail addresses:* [ksmith@pittstate.edu](mailto:ksmith@pittstate.edu) (K.L. Smith), [swanson@uta.edu](mailto:swanson@uta.edu) (P.E. Swanson).

<sup>1</sup> Tel.: +1 817 272 3841.

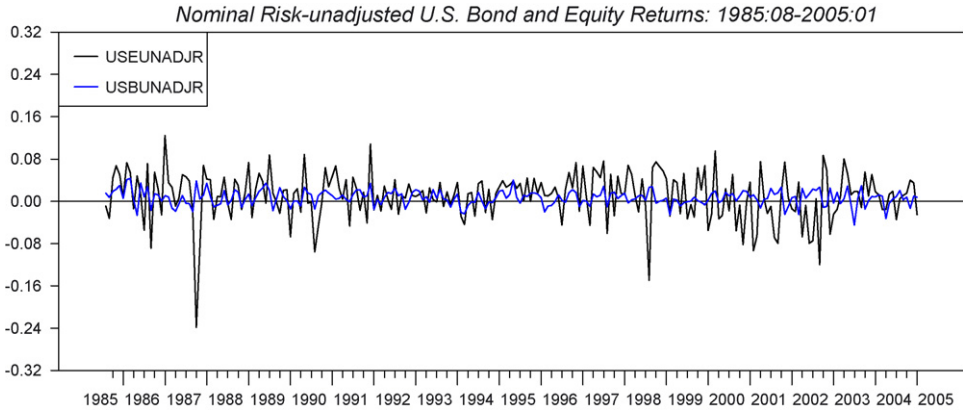


Fig. 1. USEUNADJR is U.S. equities unadjusted for risk. USBUNADJR is U.S. government bonds unadjusted for risk.

relationships among bond and equity markets. Following an early study by Agmon (1972), which finds substantial correlation among U.S., U.K., German, and Japanese equity markets, numerous studies have investigated relationships among worldwide stock markets with the general consensus that international diversification benefits exist across equity markets. Early bond studies also demonstrate the benefit of international diversification. For example, Solnik (1974) makes a case for international diversification of bond portfolios by showing that risk is reduced when foreign bonds are added to a U.S. bond portfolio. The relatively small amount of research dealing with linkages of world government bond and world equity markets is surprising given the attention paid to these international financial markets separately. Much of the previous work has been primarily limited to the relationships between bond and equity markets within the U.S. only. There is a growing literature, however, which studies the relations among cross-border stock–bond relations.

This study contributes to this expanding literature. It encompasses stock and bond markets in major capital markets around the world as represented by the G7 countries. Using the U.S. government bond market as the benchmark, the study investigates linkages across asset classes (government bonds and equities) and across national borders.

The study extends the literature in several dimensions. A primary contribution is testing diversification benefits using, not just real returns, but real, risk-adjusted returns. Real terms remove the effect of inflation, but without adjusting for risk, the data indicate that stocks have performed better than government bonds since the early 19th century (Siegel, 2002). After adjusting for risk, however, stock performance is no longer consistently superior to that of bonds. Fig. 1 plots the nominal, risk-unadjusted U.S. government bond and equity markets, the U.S. stock market being much more volatile than the government bond market. Once the data are adjusted for inflation and risk, the differences virtually disappear as shown in Fig. 2.

Another contribution of the study is the recognition that diversification gains may differ over different investment horizons. Thus, both short- and long-run relationships between major bond and equity markets are examined. Rolling correlations among the U.S. government bond market and the seven equity markets show alternating periods of positive and negative correlations. Variance decompositions and impulse responses are also used to describe the dynamics of these markets. In addition, cointegration tests are performed to investigate long-term comovements among the series.

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