Athens Journal of Business & Economics –
Volume 11, Issue 2, April 2025 –Pages 211-222

What Drives the Correlation of Stock and Bond Returns in the US and UK Markets?

By Spyridon Kountouris[*]*, Constantinos Alexiou*[±] *& Sofoklis Vogiazas*[°]

The stock-bond correlation is critical to investment activities, such as forming optimal portfolios, designing hedging strategies, and assessing risk. This paper examines this relationship using a rolling correlation between long-term government bonds and stock returns. We focus on the US and the UK markets and show that the stock-bond correlation follows a similar reverting pattern in both markets during the past twenty years. Overall, volatility in equity market returns, jointly with macroeconomic factors such as interest rates, growth in GDP per capita and inflation, can efficiently explain the rolling correlation between stock and bond returns. However, the stock-bond correlation is not determined by the same macroeconomic factors in both markets, implying that the explanatory power of each factor varies from country to country. The results can provide invaluable insights into asset allocation decisions by forecasting the expected correlation between stock and bond returns using macroeconomic factors.

Keywords: *stock-bond correlation, rolling correlation, macroeconomic drivers, stock market volatility, asset allocation*

Introduction

Numerous studies over the past years have attempted to shed light on the correlation between stocks and long-term government bond returns. In the US and UK context, Shiller and Beltratti (1992) analyzed the returns of these two financial assets, concluding that the subject correlation is too high and there is no need to be justified by a theory. Similar results were reported by Campbell and Ammer (1993), while both studies show that the correlation remains unchanged over the years. Barsky (1989) proves that macroeconomic factors, such as real interest rates, growth of the economy, and market risk, could affect the direction that the returns of the fixed income and equity markets follow. As a result, the same macroeconomic factors could be used to explain the correlation between stock and government bond returns.

More recent studies focus on the factors that affect the direction of the correlation between stock and government bond returns (Johnson et al. 2014). Diverse factors could affect the returns of the two asset classes and their correlation. Fleming et al.

[*]Financial Analyst and Quant Trader, European Dynamics and Cranfield School of Management, Cranfield University, UK.
[±]Professor, Cranfield School of Management, Cranfield University, UK.
[°]Financial Analyst, Black Sea Trade and Development Bank, Greece.

(1998) show that the information that flows in the equity and fixed-income markets tends to increase market volatility. Furthermore, David and Veronesi (2008) show that the variances and covariances of stock and bond returns could be increased or decreased based on the uncertainty about macroeconomic factors like inflation.

Stivers and Sun (2002) provide a distinct perspective by explaining the "flight to quality" phenomenon; investors switch to safer assets when the risk hikes. The authors suggest that risk could be captured by the volatility in the stock market returns and examine the effect of that increased volatility on the fixed-income market. Similarly, Gulko (2002) found significant changes in the correlation between the stock and bond returns when the stock market is about to crash. In the same vein, Li (2002) shows that uncertainty about expected inflation and interest rates significantly impact the correlation between stock and bond returns. Connolly et al. (2005) also find that market volatility has significant explanatory power of the stock-bond correlation.

A wealth of studies has elaborated on the influence of macroeconomic announcements on both the bond and stock markets (Alfonso et al. 2020, Ambler and Rumler 2019, Alexiou et al. 2018; Cutler et al. 1989, Fleming and Remolona 1999, Balduzzi et al. 2001, Fair 2003). These studies have found that such announcements affect short-term returns of stocks and bonds. Furthermore, Boyd et al. (2005) and Andersen et al. (2007) proposed that the business cycle could explain the correlation between stock and bond returns. Consequently, a stronger correlation is typically observed during economic expansions, while it weakens during economic contractions. Notably, Yang et al. (2009) indicated that the US and the UKs fixed income and equity markets do not necessarily follow analogous patterns. It is therefore evidenced that different markets appear to react diversely during recessions and expansions.

Although many studies have attempted to estimate the correlation between stock and government bond returns and the impact of macroeconomic factors, the results appear inconclusive as the correlation ranges from weak to strong and positive to negative. Overall, it remains difficult to estimate the stock-bond relationship reliably as it can change drastically with macroeconomic conditions.

This paper investigates the correlation between stock and long-term government bond returns, focusing on the US and the UK markets. We show that the stock-bond correlation in both markets follows a similar reverting pattern. One of the key findings of our paper is that different macroeconomic factors determine the correlation between stock and government bond returns in the US and UK. Furthermore, our results suggest that the most significant factor is the uncertainty about the stock market, which is proxied by the volatility of stock returns. Other macroeconomic factors, like interest rates, growth in GDP per capita and the economy's business cycle, are also significant but to a lesser degree.

The remainder of the paper is structured as follows. Section 2 presents a brief account of the related literature and the development of the hypothesis, while section 3 describes the data and the methodology used. Section 4 presents the estimated correlation of the stock-bond returns and provides the model specification. Section 5 reports and discusses the regression results, and section 6 concludes the paper.

Brief Literature Review

Numerous studies have attempted to estimate the correlation between stock and bond returns. These studies differentiate from each other based on asset returns (Shiller and Beltratti 1992), econometric methods (Urga and Cajigas 2006, Baele 2007), sample periods (Lander et al. 1997) and the markets or countries that each study examines (Durre and Giot 2005). One popular model among practitioners that measures the correlation between stock and bond returns is the Fed model, which assumes the expected growth rate equals zero and risk premiums are the same for both asset classes. However, as shown by Estrada (2009), the Fed model provides only valid results for a certain period in the US market.

The results presented by several studies do not provide a clear picture of the correlation between stock and government bond returns. On the one hand, some evidence indicates a positive correlation between stock and government bond returns, as both financial assets are exposed to the same macroeconomic factors. In other words, investors are expected to hold stocks and long-term government bonds in their portfolios when the economy is booming. Several studies provide evidence of a positive correlation between the two financial assets (Keim and Stambaugh 1986, Campbell and Ammer 1993, Kwan 1996). On the other hand, a negative correlation between stock and government bond returns is observed when the economy shrinks and the stock market is down. In such cases, the negative correlation is explained by the investors' risk-averse attitude that opt for safer assets like government bonds; investors rush into them when they fear for the future. Moreover, McMillan (2019) in a study examining the interrelations and time-varying correlations for eight assets, using a one-year rolling correlation framework found that the establisherd correlations exhibited both positive and negative values.

Therefore, as the bond market attracts more investors than the equity market, a negative correlation is generated between these two financial assets. This financial phenomenon that has been observed in several economies is known as "flight to quality" or "flight to safety", (Hartmann et al. 2001). But negative correlation is also observed during big market rallies, when investors are less risk-averse, seeking a high return. Most investors move from the bond to the equity market during these booming periods to generate higher profits. Such a case, also known as "flight from quality", is documented by several studies (Gulko 2002, Connolly et al. 2005, Andersson et al. 2008). These researchers show that stock market uncertainty could affect the correlation between stock and government bond returns. In particular, when market uncertainty is high, the correlation between stock and government bond returns should be negative.

Inflation plays a crucial role in shaping the correlation of equity and bond returns (Lombardi and Sushko 2023). Fama and Schwert (1977) examine the relationship between stock and bond returns in the context of inflation. The authors laid the groundwork for understanding how inflation affects asset returns and, by extension, the correlation between stocks and bonds. Baele et al. (2007) examine the determinants of the correlation between stock and bond returns, focusing on the role of macroeconomic variables and financial market conditions. In a study of the G7 countries over 40 years, Li (2002) found that each country's stock-bond correlation

coefficient follows a similar reverting pattern. In addition, the author finds that interest rates are a principal driver of the correlation. Also, inflation affects stock or bond returns by causing them to move in opposite directions, suggesting a negative correlation.

Development of Hypotheses and Research Questions

Overall, the relationship between stock and bond returns and their correlation remains an important and dynamic research area. The preceding literature review context has highlighted the complex and evolving nature of this correlation and its significance for investors and portfolio managers. In this context, enriching our understanding by looking at other potential factors at play is imperative.

Connolly et al. (2005) suggest that the correlation between stock and bond returns should be negative when uncertainty rises. Increased uncertainty about future economic conditions means that the perceived risk in the market is high. In such cases, the government bonds are preferred by investors. Usually, under these circumstances, investors tend to reallocate their portfolios by showing increased preference for fixed-income securities as considered safer investments. This phenomenon, known as "flight to quality", clearly explains that volatility directly affects the correlation between bond and stock returns. Thus, volatility can be reasonably one of the independent variables in our regression model.

Furthermore, Chiang and Li (2005) show that gross domestic product, which is used as a proxy for the economic growth in a country, has a significant role to play in our model. Specifically, when gross domestic product per capita grows and a country's economic growth rises, the correlation between stock and bond returns should be higher. In a stable economy, where capital inflows are high, and the perceived country risk is low, the demand for financial assets like government bonds and stocks increases. However, when the growth in gross domestic product stalls, the effect on the correlation between stock and bond returns is more complex.

According to Chiang and Li (2005), interest rates and inflation are critical determinants of the correlation between stock and bond returns. Generally, evidence suggests that the interest rate level is positively correlated with the bond-stock correlation. Interest rates positively impact the government bond yield to maturity due to the term structure relationship. In contrast, the federal funds rate and stock returns seem to be negatively associated. In Friedman's (1969) words, "in a moderate growth environment, both stock and bond yields are seen to advance at a moderate pace due to the income effect, while the federal funds rate is likely to be higher when demand for loanable funds as income expands puts pressure on the market". Thus, the result should be a positive relation between stock and bond correlation and the federal funds rate. However, it is argued that inflation causes a decline in stock returns and is typically viewed as a threat to profits by investors. On the other hand, bond yield should be positively associated with inflation. Therefore, the inflation rate is expected to be negatively related to the correlation between stock and bond returns.

In another study, Yang et al. (2009) suggest that the interplay between business cycles and financial markets significantly impacts the correlation between stock and

bond returns. Typically, the returns on various financial assets exhibit volatility during economic downturns, prompting investors to seek portfolio risk reduction through diversification. However, the approach to diversification during these extreme periods varies across countries. In the United States, a pronounced correlation between stock and government bond returns is observed during economic expansions, contrasting with a weaker correlation in times of recession. Conversely, Yang et al.'s (2009) findings for the UK present a contrary scenario. As a country heads into a recession, heightened economic uncertainty prompts investors to mitigate their exposure. Subsequently, during recessions, bond prices tend to surge while yields decrease, whereas equity prices tend to plummet. As the economy rebounds, bond prices typically decline while equity prices rise. During tumultuous times, equities, being perceived as risky assets, are avoided.

Initially, taking stock of the aforementioned empirical and theoretical underpinnings, the paper aims to estimate the stock-bond correlation by using a rolling correlation between long-term government bonds and stock returns. As a second step, the paper aims to explore the extent to which various factors influence the estimated rolling correlation between stock and bond returns. Thus, the research questions are formulated as follows:

> *RQ1*: What are the key determinants of the rolling correlation between long-term bonds and stock returns?
> *RQ2*: Do economic uncertainty, GDP growth, interest rates, inflation, and business cycle phases explain the correlation between long-term bonds and stock returns?

Data and Methodology

In the spirit of Chiang and Li (2009), we use the S&P 500 index as a proxy for the US equity market, while the 10-year US bond yield was used to proxy the respective fixed-income market. Similarly, in the UK, the FTSE 100 index was used as a proxy for the equity market, and the 10-year UK bond yield was used as a proxy for the fixed-income market. To summarise, eleven years of daily data, in the period 1995 to 2016, were used for both countries. We used 2016 as a cutoff point for our research because of sharp reversals and non-conventional monetary policies in both countries that took place in the subsequent period. As such, we maintain that the period from 2017 onwards merits a follow-up study encompassing more advanced econometric modelling. The ensuing period marks a regime change, given the ultra-low rates with a material impact on stock and bond valuations.

Table A1 in the Appendix provides the data sources used in this paper. Table 1 presents the descriptive statistics for the stock and bond indices in the two markets, while Table 2 provides the descriptive statistics for the bond and stock returns in the two markets.

Table 1. *Descriptive Statistics for the Market Indexes and the 10-year Government Bonds*

	Mean	Min	Max	Std. Deviation	Skewness	Kurtosis
S&P 500 Index	1,228.15	459.11	2,130.82	364.62	0.41	0.21
FTSE 100 Index	5,377.15	2,954.20	7,103.98	996.35	-0.45	-0.85
10-Year US Govt Bond Yield	4.26	1.40	7.88	1.49	0.01	-0.92
10-Year UK Govt Bond Yield	4.52	1.33	8.8	1.72	0.35	-0.19

Table 2. *Descriptive Statistics for the Returns in Market Indexes and the 10-year Government Bonds*

	Mean	Min	Max	St. Deviation	Skewness	Kurtosis
S&P 500 Index	0.00	-0.09	0.12	0.01	-0.06	8.17
FTSE 100 Index	0.00	-0.09	0.10	0.01	-0.03	5.97
10-Year US Govt Bond Yield	0.00	-0.16	0.10	0.02	0.18	4.23
10-Year UK Govt Bond Yield	0.00	-0.09	0.13	0.02	0.42	6.02

The returns in both markets fluctuate around a mean of zero per cent return with a standard deviation that ranges between 1% to 2%. Nonetheless, extreme daily returns of around +/-10% are observed in the sample. It should also be noted, that the unit root tests produced satisfactory results in all four stock-bond return series. In particular, an ADF test is conducted for all the return series, stock and government bond returns for the two countries. The results indicate that the null hypothesis can be rejected for all four of the return series at 1% significance level, as the computed t-statistic is lower than the critical value. In other words, the ADF test shows that there is no unit root in any of the two returns series, and hence any reasonable forecasting and any regression analysis could be applied and provide reliable results. For economy of space, we opted to leave out the table with the ADF tests but they are available upon request.

In the second part of the paper, we specify and estimate a regression model as we seek to identify the factors with explanatory power on the correlation between stock and government bond returns. The final model specification consists of four independent variables. The first one captures the uncertainty and the economy's risk as proxied by the standard deviation of the stock returns. We also included in our model the growth in GDP per capita and the interest rates for both countries. Last, the model included a dummy variable to capture each country's recessions. For the examined period (1995-2016), according to the Office for National Statistics, the UK has suffered one recession, i.e., the 2008 Global Financial Crisis (GFC). The recession lasted five quarters, from the second quarter of 2008 until the third quarter of 2009. On the other hand, the US has suffered two financial crises since 1996. The '90s, one of the highest expansionary periods in American history (Kliesen 2003), was followed by a brief two-quarter recession in the early 2000s. The second recession occurred with the US housing bubble bursting, culminating in a perfect storm, leading to the GFC. According to the Business Cycle Dating Committee (2010), the crisis lasted one and a half years, starting in December 2007.

Stock-Bond Returns Correlation and Model Specification

We use the rolling correlation method in the spirit of Chiang and Li (2002). In this method, we calculate a time-varying correlation coefficient using a fixed window rolled ahead along the timeline. The sizes of the proposed and tested windows are (a) a monthly-sized window consisting of 22 trading days and (b) a yearly-sized window consisting of 250 trading days. Table 3 presents the descriptive statistics for the rolling correlation for both markets.

Table 3. *Descriptive Statistics for the Rolling Correlations in the US and the UK*

	Mean	Min	Max	St. Deviation	Skewness	Kurtosis
US Rolling Correlation – 22 Days Window	0.16	-0.86	0.86	0.44	-0.47	-0.91
US Rolling Correlation – 250 Days Window	0.15	-0.65	0.68	0.36	-0.77	-0.32
UK Rolling Correlation – 22 Days Window	0.17	-0.91	0.93	0.41	-0.58	-0.59
UK Rolling Correlation – 250 Days Window	0.16	-0.63	0.65	0.35	-0.90	-0.19

Table 3 shows that the 22-day rolling correlation coefficient is more volatile than the 250-day window. In general, the correlation coefficient is smoother as the window grows longer. The correlation coefficient for the return sample is 0.16 for the US and 0.17 for the UK. Based on the observed low values, there is a very weak positive correlation between the two financial assets. However, there are periods when the correlation coefficient takes extreme values, indicating a strong positive or negative correlation. In particular, as shown in Table 3, there is a positive or a negative correlation above 80% for the 22-day rolling window and above 60% for the 250-day window. The results show that measuring correlation using index levels and returns can give a completely different picture of the relationship between stock and bond markets.

Following the estimation of the correlation coefficient between stocks and long-term government bond returns, we endeavour to identify the macroeconomic determinants of the correlation coefficients. David and Veronesi (2008) and Li (2002) suggest that macroeconomic factors like interest rates, inflation, earnings and growth could affect the correlations significantly. Chiang and Li (2009) classify macroeconomic variables that could affect the correlation between stocks and bonds into three main categories: uncertainty, prosperity-economic growth, and monetary policy variables.

Several studies find that business cycles affect asset returns (Bigio and Schneider 2017, Tian 2018, Rouwenhorst 1995, Erb et al. 1994). Other studies find a stronger correlation between financial assets when the economy expands and a weaker one when the economy shrinks or is in recession (Boyd et al. 2005, Andersen et al. 2007). However, the correlation between the two financial assets reacts differently in each country. Yang et al. (2009) document different patterns in the correlation between stock and bond returns in the US and the UK when the countries are in a recession or an expansion. In the US, the pattern is the same as previous studies

suggest (Boyd et al. 2005, Andersen et al. 2007), but the UK market does not follow the same pattern. In particular, the correlation calculated during the expansions in the UK is more robust than during recessions.

Several studies suggest that the business cycle is a significant factor in modelling the stock-bond returns' correlation. For that reason, the regression model that Chiang and Li (2009) proposed is modified to capture the impact of the business cycles. Thus, the final specification of our model is presented below:

$$\rho_{sb,t} = \varphi_o + \varphi_1 Uncertainty_t + \varphi_2 Prosperity_t + \varphi_3 Monetary_t + \varphi_4 Recession_t + v_t$$

where $\rho_{sb,t}$ is the rolling correlation coefficient; *uncertainty* reflects the expected business risk in the future. This variable is calculated based on the historical returns of the stock markets in the examined countries. According to Chiang and Li (2009), the volatility of stock returns under a specific time frame could be used as a proxy for the business risk in a country. A theoretical approach suggests that when the market is volatile, and the fear about the future economic conditions is rising, investors tend to allocate their assets differently than when the market is under normal situations. *Prosperity* captures the economic growth and is measured by capital inflows, domestic savings, and the real GDP growth rate. When prosperity is higher, as reflected by GDP growth and capital inflows, the correlation between the two markets is stronger and vice versa. The variable *monetary* reflects Fed's monetary policy. According to Chiang and Li (2009), improved liquidity from an expansionary policy when interest rates are low, could lead to a negative correlation between stock and bond returns. On the other hand, during a contractionary monetary policy, when the interest rates are high, a positive correlation between stock and bond returns should be expected. Additionally, Friedman (1969), Ohanian and Stockman (1995) show that interest rates positively correlate with economic expansions when real income and demand increases. We also include a dummy variable that captures the recessions, which could play a significant role in describing the nature of the stock-bond correlation. However, it should be stressed that recessions do not affect each economy similarly (Yang et al. 2009).

Regression Results and Discussion

The final model described before is estimated for each computed rolling correlation. Table 4 reports the regression results for the four estimated models.

Table 4. *Regression Results*

	US Rolling Correlation		**UK Rolling Correlation**	
	22-Days window	**250-Days window**	**22-Days window**	**250-Days window**
Uncertainty	23.198***	11.528***	34.791***	23.909***
	(6.75)	(7.92)	(6.56)	(11.59)
Prosperity	0.002***	0.001***	0.001***	0.001***
	(4.72)	(7.56)	(5.62)	(8.52)
Monetary	-0.057***	-0.082***	0.038	-0.019
	(-7.91)	(-6.12)	(0.52)	(-1.15)
Recession	0.039	0.077	-0.273**	-0.846*
	(0.69)	(1.12)	(-2.24)	(-1.85)
Observations	90	90	90	90
Prob > F	0.000	0.000	0.000	0.000
St. Error	0.260	0.209	0.269	0.263
Adj. R^2	0.60	0.69	0.61	0.61

(*), (**) and (***) denote significance at 10%, 5% and 1% level respectively. t-statisitcs in parentheses.

According to the empirical literature (Li 2002), all three variables (*uncertainty*, *prosperity* and *monetary*) are highly significant in the case of the US. Yet, in the UK, the monetary conditions as proxied by the interest rates do not yield a significant effect. Furthermore, the business cycle proxied by the recession dummy proved significant in the UK, compatible with Boyd et al. (2005) and Andersen et al. (2007), but not in the US. The latter agrees with Yang et al. (2009), who suggest that the impact of the business cycle on the correlation between stock and government bond returns varies across different countries.

Also, our results contradict the "flight to quality" phenomenon. In particular, during the GFC of 2008, the "flight to quality" did not seem to hold. From late 2007 till 2009, uncertainty obtains extreme values due to a very volatile equity market. Following Connolly (2005), investors diversify their portfolios during extreme periods, looking for safer investments. The latter would result in a negative correlation between stock and government bond returns. However, our results show a fivefold increase when the GFC starts, resulting in a strong positive correlation between the two financial assets. Thus, under certain market conditions, the diversification between stocks and bonds may not be as effective as most portfolio managers would assume (Johnson et al. 2014).

In both countries, about 60% of the variation in the rolling correlation is explained by the independent variables. While the same reverting pattern was observed in both countries, the rolling correlations are not explained by the same macroeconomic factors. In contrast to the UK, the business cycle was insignificant in the US. Similarly, the *monetary* variable was significant for the UK but not for the US. Interestingly, for both countries, the most significant variable was *uncertainty*. The remaining independent variables for each country were still significant but to a lesser degree. In passing, our models' reliability proved to be relatively good, judging from the regression diagnostics.

Conclusions

The correlation between stock and long-term government bond returns is crucial for asset allocation decisions as it helps investors diversify their portfolios and manage their exposure.

However, the results of the existing literature are inconclusive because of the dynamic nature of the stock-bond correlation. Overall, estimating the stock-bond relationship reliably remains challenging as it can change drastically depending on the prevailing macroeconomic conditions. This paper examines this relationship from 1995 to 2016 using a rolling correlation between stock and long-term government bond returns and two different window lengths.

We focus on the US and the UK markets and show that the stock-bond correlation follows a similar reverting pattern. A weak positive correlation is observed for both countries. Yet, the macroeconomic factors that drive that correlation differ in the countries examined. In both countries, the estimated models consist of three significant factors, while uncertainty and prosperity are common significant factors in both US and UK. In the case of the US, the third significant factor is monetary, while the business cycle variable is not significant. On the other hand, in the UK, the monetary variable is not significant, suggesting that changes in the interest rates do not affect the correlation between stock and government bond returns in the period considered. Yet, the dummy variable that captures the recessionary periods in UK has a significant impact in line with past empirical studies. While in both markets, uncertainty measured by the volatility in the stock market is the most significant determinant of the stock-bond return correlation, other macroeconomic variables are also important, but to a lesser degree.

References

Alexiou C, Vogiazas S, Taqvi A (2018) Macroeconomic announcements and stock returns in US portfolios formed on operating profitability and investment. *Investment Management and Financial Innovations* 15(1): 68–89.

Alfonso A, Tovar Jalles J, Kazemi M (2020) The effects of macroeconomic, fiscal and monetary policy announcements on sovereign bond spreads. *International Review of Law and Economics* 63(Sep): 105924.

Ambler S, Rumler F (2019) The effectiveness of unconventional monetary policy announcements in the euro area: An event and econometric study. *Journal of International Money and Finance* 94 (Jun): 48–61.

Andersen TG, Bollerslev T, Diebold FX, Vega C (2007) Real-time price discovery in stock, bond and foreign exchange markets. *Journal of International Economics* 73(2): 251–277.

Andersson M, Krylova E, Vähämaa S (2008) Why Does the Correlation between Stock and Bond Returns Vary Over Time? *Applied Financial Economics* 18(2): 139–151.

Baele Lieven B, Bekaert G, Inghelbrecht K (2007) The Determinants of Stock and Bond Return Comovements. *The Review of Financial Studies* 23(6): 2374–2428.

Balduzzi P, Edwin JE, Green TC (2001) Economic News and Bond Prices: Evidence from the U.S. Treasury Market. *Journal of Financial and Quantitative Analysis* 36(4): 523–543.

Barsky RB (1989) Why Don't the Prices of Stocks and Bonds Move Together? *American Economic Review*, 79(5), pp. 1132–1145.

Bigio S, Schneider A (2017) Liquidity shocks, business cycles and asset prices. *European Economic Review* 97(Aug): 108–130.

Boyd JH, Hu J, Jagannathan R (2005) The stock market's reaction to unemployment news: Why bad news is usually good for stocks. *Journal of Finance* 60(2): 649–672.

Business Cycle Dating Committee (2010) National Bureau of Economic Research, September 2010.

Campbell JY, Ammer J (1993) What Moves the Stock and Bond Markets? A Variance Decomposition for Long Term Asset Returns. *Journal of Finance* 48(1): 3–37.

Chiang TC, Li J (2009) *The Dynamic Correlation between Stock and Bond Returns: Evidence from the U.S. Market*. Available at: http://dx.doi.org/10.2139/ssrn.1362225.

Connolly RA, Stivers CT, Sun L (2005) Stock Market Uncertainty and the Stock-Bond Return Relation. *Journal of Financial and Quantitative Analysis* 40(1): 161–194.

Cutler D, Poterba J, Summers L (1989) What Moves Stock Prices. *Journal of Portfolio Management* 15(3): 4–12.

David A, Veronesi P (2008) *Inflation and Earnings Uncertainty and the Volatility of Asset Prices: A Structural Form Approach*. Chicago GSB Research Paper. University of Calgary Haskyane School of Business Working Paper.

Durre A, Giot P (2005) *An International Analysis of Earnings, Stock Prices and Bond Yields*. ECB Working Paper No. 515.

Erb CB, Campbell RH, Tadas VE (1994) Forecasting International Equity Correlations. *Financial Analysts Journal* 50(6): 32–45.

Estrada J (2009) The Fed Model: the Bad, the Worse and the Ugly. *The Quarterly Review of Economics and Finance* 49(2): 214–238.

Fair RC (2003) Shock Effects on Stocks, Bonds, and Exchange Rates. *Journal of International Money and Finance* 22(3): 307–341.

Fama EF, Schwert WG (1977) Asset Returns and Inflation. *Journal of Financial Economics* 5(2): 115–146.

Fleming J, Kirby C, Ostdiek B (1998) Information and Volatility Linkages in the Stock, Bond, and Money Market. *Journal of Financial Economics* 49(1): 111–137.

Fleming MJ, Remolona EM (1999) What Moves the Bond Market. *Journal of Portfolio Management* 25(4): 28–38.

Friedman M (1969) Factors Affecting the Level of Interest Rates. In *Proceedings of the 1968 Conference on Saving and Residential Financing*. Chicago: United States Saving and Loan League.

Gulko L (2002) Decoupling. *Journal of Portfolio Management* 28(3): 59–66.

Hartmann P, Straetmann S, De Vries CG (2001) *Asset Market Linkages in Crisis Periods*. ECB Working Paper No. 71.

Johnson N, Naik V, Page S, Pedersen N, Sapra S (2014) The stock-bond correlation. *Journal of Investment Strategies* 4(1): 3–18.

Keim DB, Stambaugh EB (1986) Predicting Returns in the Stock and Bond Markets. *Journal of Financial Economics* 17: 357–390.

Kliesen KL (2003) The 2001 Recession: How Was It Different and What Developments May Have Caused It? Review, Federal Reserve Bank of St. Louis, 85: 23–38.

Kwan SH (1996) Firm-Specific Information and the Correlation between Individual Stocks and Bonds. *Journal of Financial Economics* 40(1996): 63–80.

Lander J, Orphanides A, Douvogiannis M (1997) Earnings Forecasts and the Predictability of Stock Returns: Evidence from Trading the S&P. *Journal of Portfolio Management* 23(4): 24–35.

Li L (2002) *Macroeconomic Factors and the Correlation of Stock and Bond Returns*. Working Paper. Yale University.

Lombardi MJ, Sushko V (2023) The correlation of equity and bond returns. *BIS Quarterly Review* (Dec).

McMillan D (2019) Cross-asset relations, correlations and economic implications. *Global Finance Journal* 41(Aug): 60–78.

Ohanian LE, Stockman AC (1995) Theoretical Issues of Liquidity Effects. *Quarterly Review* 77(3): 3–25.

Rouwenhorst KG (1995) Asset Pricing Implications of Equilibrium Business Cycle Models. In TF Cooley (ed.), *Frontiers of Business Cycle Research*, 294–330. Princeton NJ: Princeton University Press.

Shiller RJ, Beltratti AE (1992) Stock Prices and Bond Yields: Can Their Comovements Be Explained in Terms of Present Value Models? *Journal of Monetary Economics* 30(1): 25–46.

Stivers C, Sun L (2002) Stock Market Uncertainty and Bond Returns: Evidence of Flight-to-Quality? University of Georgia Working Paper.

Tian M. (2018) Tradability of output, business cycles and asset prices. *Journal of Financial Economics* 128(1): 86–102.

Urga G, Cajigas J (2006) *Forecasting Cross-Market Correlations: The Case of Bonds and Stocks*. Centre for Econometric Analysis, Research Proposal.

Yang J, Zhou Y, Wang Z. (2009) The stock-bond correlation and macroeconomic conditions: One and a half centuries of evidence. *Journal of Banking and Finance* 33(4): 670–680.