Bond-Stock Comovements*

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Abstract

This paper documents that during the late 20th Century, nominal government bonds and stocks tended to comove positively, whereas during the first quarter of the 21st Century they have tended to comove negatively. A similar sign switch is observable for real government bonds and breakeven inflation rates. Recent macroeconomic events have caused short-lived changes in these comovements, and periods with high risk premia tend to be periods in which bond-stock comovements are large in absolute value. The paper surveys theoretical models of these phenomena.

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1 Introduction and Empirical Facts

Government bonds are one of the fundamental building blocks of the financial system, the financing of the public sector, and investors' portfolios. It is therefore important to understand whether they are risky—comoving positively with risky assets such as stocks—or safe—comoving negatively with stocks and hedging risks from the stock market. Since most government bonds are nominal, paying out in local currency units such as US dollars, British pounds, or Euros, the prices of these bonds are sensitive to inflation expectations. Government bond risks can therefore be attributed to inflation, real factors, or a combination. This paper documents the key patterns in advanced economy government bond risks, decomposed into their real and inflation components, and reviews the literature on the drivers of changing risks in government bonds.

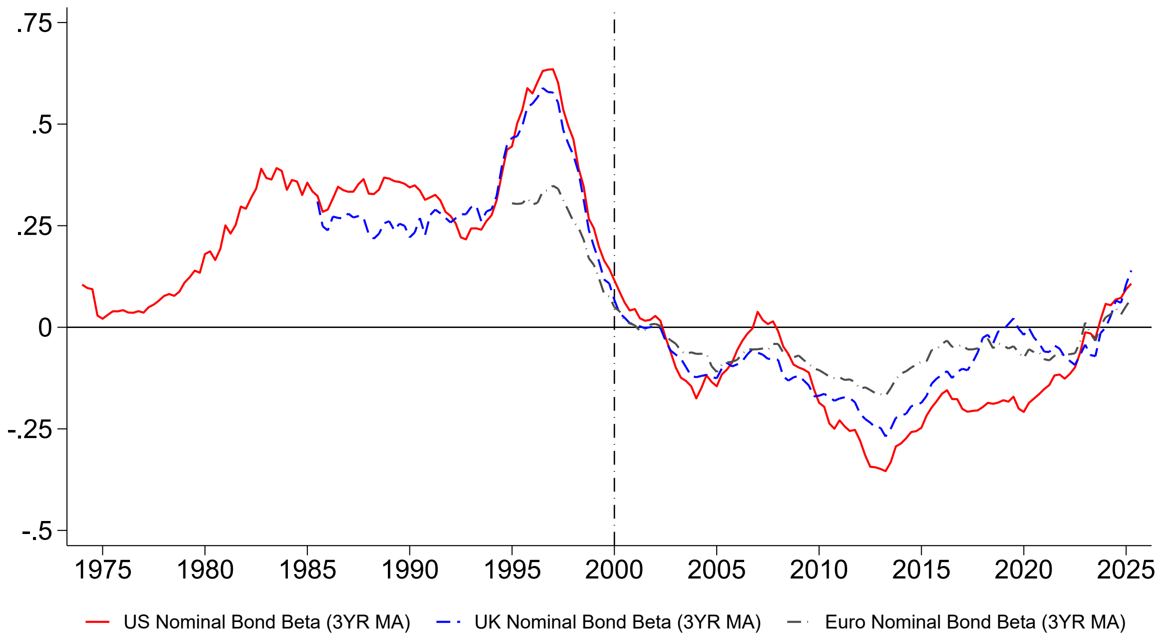
1.1 The Sign Switch at the Millennium

A key fact about bond-stock comovement is that it changed sign from negative to positive around the turn of the millennium (Campbell et al., 2009; Baele et al., 2010; Viceira, 2012; Campbell et al., 2017; Song, 2017). Figure 1 illustrates this fact using data from the US, the UK, and Europe. We measure the comovement between government bond returns and local stock returns with the beta (regression coefficient) of nominal government bond returns on local stock returns using a rolling window of daily data.[1] When the nominal bond-stock beta is positive, bonds and stocks tend to rise and fall together, and bonds are risky like stocks. Conversely, a negative bond-stock beta indicates that bonds tend to rise when the stock market falls, and bonds hence pay out in states of the world that investors value most.

The bond-stock beta is not the only way to measure comovement. Alternatives include the covariance and the correlation between government bonds and stocks; but these alternatives always have the same sign as the beta since they can be written as the beta times a positive scale factor (the variance of stock returns for the covariance, and the ratio of the standard deviation of stock returns to the standard deviation of bond returns for the correlation). Thus, the evidence for a sign switch in the beta around the year 2000 is also evidence that the covariance and correlation changed signs at this time. In this paper, we use the bond-stock beta as a convenient summary statistic for comovement and mention the other measures only when they behave differently in the data or in theoretical models.

[1] Denoting the daily log nominal government bond return in country c by $r_t^{c,nom}$ and the daily stock return in country c by $r_t^{c,stock}$, the nominal bond-stock beta is estimated as the regression coefficient β^{nom} from $r_t^{c,nom} = \alpha^{nom} + \beta^{nom} r_t^{c,stock} + \varepsilon_t$. We estimate (1) using a backward-looking rolling window of 90 days. For Figure 1 we keep the last observation of each quarter and report a moving average over the past twelve quarters.

Figure 1. Fifty Years of Bond-Stock Comovements This figure shows rolling regression coefficients of daily log 10-year nominal government bond returns onto daily stock returns for the US, the UK, and the Eurozone. Bond-stock betas are estimated using the past 90 days at each quarter-end. We then smooth these quarter-end bond-stock betas over a 12-quarter backward-looking window, requiring at least 6 quarters of observations. US stock returns correspond to the S&P 500, UK stock returns correspond to the FTSE 100, and European stock returns correspond to the STOXX Europe 600. Log bond returns are computed from changes in yields. Nominal 10-year zero-coupon yields from Gürkaynak et al. (2007) start in 1971.Q3, zero-coupon yields from the Bank of England start in 1984.Q1, and zero-coupon yields from the ECB start in 2004.Q3. European bond-stock betas are computed using daily 10-year German Treasury yields from Global Financial Data from 1993.Q3 through 2004.Q4. Because GFD yields are coupon bonds, we estimate the returns using the approximate duration for par bonds as in Campbell et al. (1997). The turn of the millennium is indicated with a vertical dashed line. The last quarter of observations is 2025.Q2.



While Figure 1 shows that the bond-stock beta switched sign some years before the global financial crisis of 2008-2009, the crisis illustrates the hedging value of bonds in the 21st Century environment. The stock market fell in 2008, but at the same time government bonds rallied. The increase in the value of bonds cushioned a traditional 60-40 stock-bond portfolio from the dramatic stock market movements during the crisis. In this sense government bonds were a "safe haven" for investors. However, Figure 1 makes clear that government bonds are not always a safe haven. In the late 20th Century, government bonds moved with, not against the stock market.

In the most recent period 2023-2025, Figure 1 shows an increase in global bond-stock betas to positive levels, although it is too early to say whether this presages a return to the persistently positive bond-stock betas seen in the last century.[2] After the pandemic of

[2]Gomez-Cram et al. (2024) documents the recent rise in government bond-stock correlations, while

2020, many developed countries experienced high inflation in 2021 at levels not seen for four decades. Central banks in the US, UK, and Europe initially kept interest rates at zero, lifted off a year or more after the initial inflation increase, and reached a peak of the monetary policy cycle in late 2023. While this recent inflationary experience bears some resemblance to the macroeconomic environment of the inflationary 1970s and 1980s, there are also notable differences, in particular regarding the conduct and perceptions of monetary policy.[3] It is therefore reasonable to expect some similarities but also differences in recent bond-stock comovements compared to the Great Inflation of the 1970s and 1980s.

1.1.1 Real and Inflation Components

A simple way to better understand the economic drivers of bond-stock comovements is to decompose them into real and inflation components. The blue dashed line in Figure 2, Panel A shows that UK real bond-stock betas were positive before 2000. In addition, Panel B shows that the inflation component of UK bond-stock betas (i.e., the difference between nominal and real bond-stock betas) was also strongly positive during this period, contributing to the overall high nominal bond risks visible in Figure 1 before 2000.[4] Unfortunately, the US did not have inflation-indexed bonds or inflation swaps, which are needed for this decomposition, until much more recently. However, given the similarities between the US, the UK, and the Eurozone in Figure 1, we view data from UK inflation-indexed bonds during the 1980s as informative more broadly.

After 2000, Figure 2, Panel A shows that real bond-stock betas turned negative in all three regions. Panel B shows that the inflation component of bond-stock betas also turned negative, so both components contributed to the safety of nominal bonds after 2000. Naturally, these sign switches also occurred in correlations and covariances, given the positive scaling relationships between these measures of comovement.

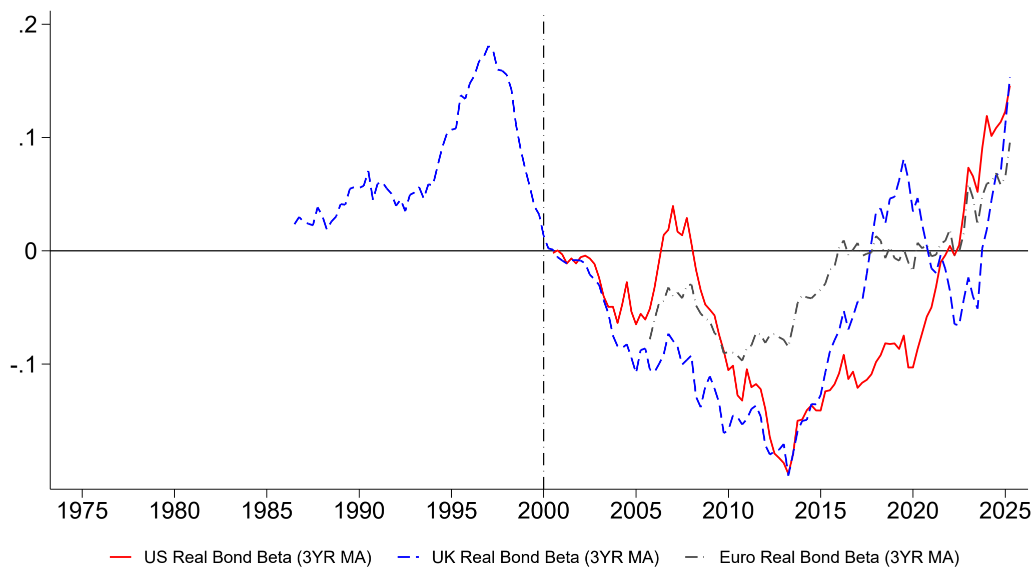
Pflueger (2025) points out that this rise occurred relatively late compared to the rise of inflation in 2021 and models the monetary policy drivers.

[3]Bauer et al. (2025) document changing perceptions of the Fed's inflation reaction during the 2022-2023 hiking cycle.

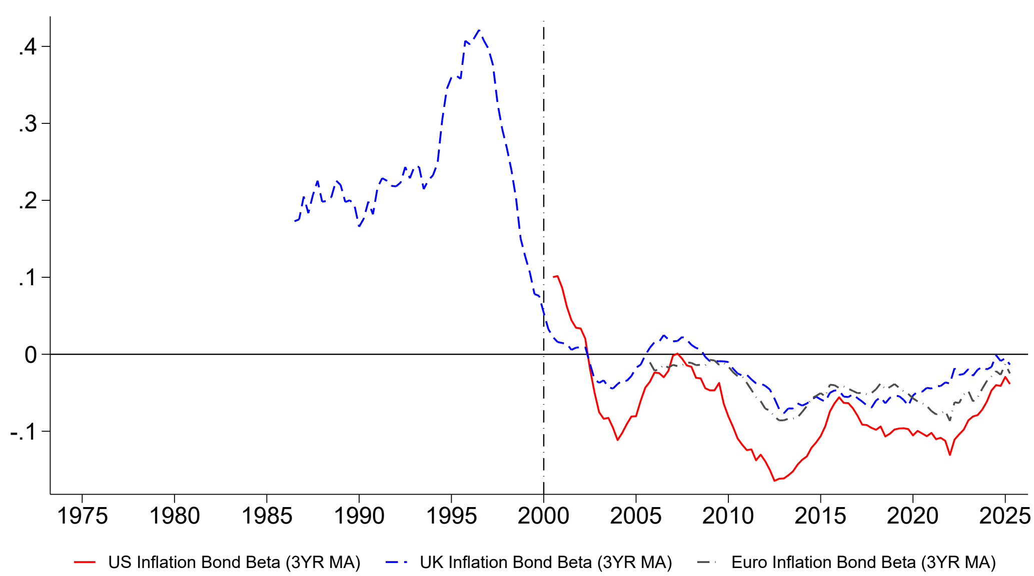
[4]An advantage of our focus on betas, rather than correlations, is that betas satisfy an adding up constraint so the betas in Panels A and B of Figure 2 add up to the nominal beta in Figure 1. In recent years, where inflation swap data are available, we use inflation swap rates rather than breakeven inflation rates imputed from inflation-indexed government bond yields. Full details are given in the note to Figure 2. For simplicity, we refer to the "inflation component of bond-stock betas" whether we are using breakeven rates or inflation swap rates to measure them.

Figure 2. Real and Inflation Components of Bond-Stock Comovements. This figure shows rolling regression coefficients of the real and inflation components of daily government bond returns onto daily stock returns. The estimation window and stock return data are described in Figure 1. Zero-coupon 10-year government bond yields are decomposed into $y_t^{real,10} = y_t^{real,10} - inflswap_t^{10}$, where $inflswap_t^{10}$ is the daily inflation swap rate from Bloomberg, whenever available. When inflation swap data is not available, we use 10-year zero-coupon breakeven inflation from Gürkaynak et al. (2010) (US) and from the Bank of England. Daily log real bond returns are then computed as $-10 \times \Delta y_t^{real,10}$ and daily log inflation bond returns are computed as $-10 \times \Delta inflswap_t^{10}$. Inflation swap data starts in 2005.Q1 for the US, 2004.Q4 for the UK, and 2004.Q4 for Europe. Breakeven inflation data starts in 1999.Q3 for the US, and 1985.Q3 for the UK The change of the millennium is indicated with a vertical dashed line. The last quarter of observations is 2025.Q2.

Panel A: Real Bond-Stock Betas



Panel B: Inflation Component of Bond-Stock Betas

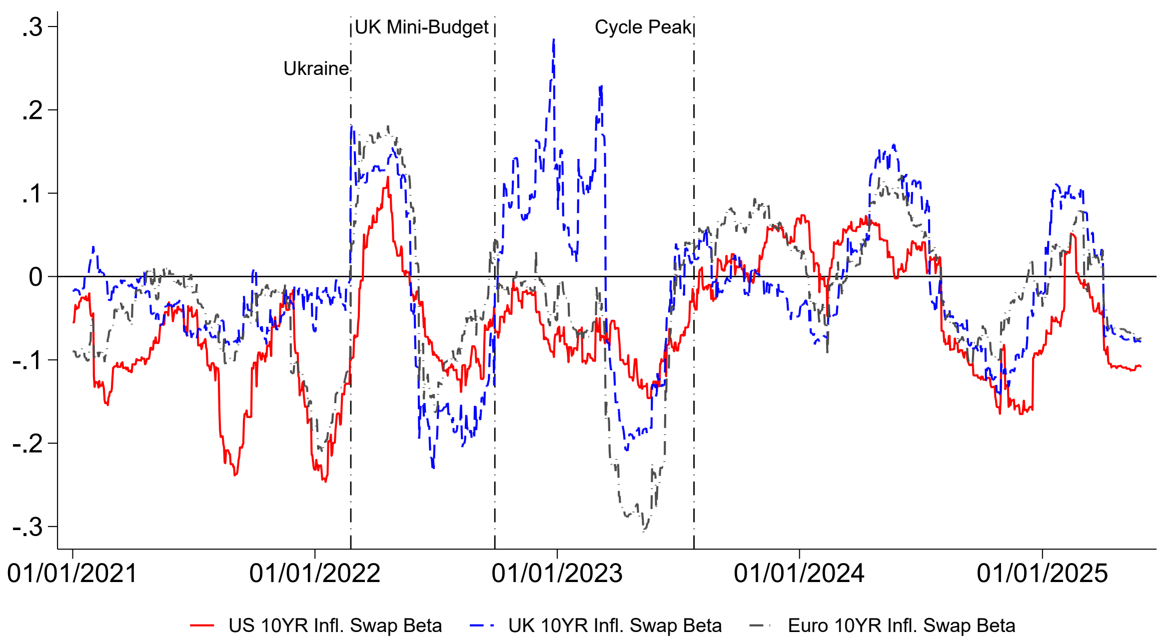


Comparing the magnitudes of the betas, however, shows that real bonds moved much less with stocks than nominal bonds did before 2000. On the other hand, real bond-stock betas have contributed substantially to the increase in nominal bond-stock betas during the most recent period since 2023, whereas the inflation components of bond-stock betas show only small increases in this period.

1.1.2 Higher Frequency Variation

The smoothing of betas over 12 quarters in Figures 1 and 2 can obscure higher-frequency variation in bond-stock comovements that may be relevant for the interpretation of recent developments. We illustrate this point in Figure 3 by plotting the inflation component of bond-stock bond betas over rolling 90-day windows, without smoothing, for a shorter sample period from January 1, 2021 through May 30, 2025.

Figure 3. Macroeconomic Events vs. Inflation Component of Bond-Stock Betas 2021-2025. This figure shows a daily series for the inflation return component of 10-year nominal bond-stock betas, estimated over a rolling backward-looking 90-day window as described in Figure 2. This figure shows the daily estimated beta without smoothing. The sample period is from January 1, 2021 through May 30, 2025.



Several important dates are marked in the figure with dashed vertical lines: Russia's 2022 invasion of Ukraine, the 2022 UK mini-budget that created a crisis in the UK government bond market, and the peak of US monetary policy tightening in 2023. We see that the invasion of Ukraine preceded a short-lived increase in inflation betas from negative to positive values, which was larger in the UK and the Eurozone than in the US, and the UK mini-budget was followed by a six-month period in which UK inflation betas, but not betas in the Eurozone or the US, were positive. We also see that the inflation component of bond-stock betas has been higher, and close to zero on average, since the peak of the US monetary policy cycle in 2023.

While these patterns do not demonstrate causality, they are highly suggestive that supply uncertainty, shifting inflation expectations, and monetary policy are among the factors contributing to positive bond-stock comovements. As we will see, economic models of bond-stock betas also imply the relevance of these factors.

1.2 Risk Premia and Bond-Stock Comovements

Risk premia are important drivers of bond and stock prices, and therefore they substantially influence bond-stock comovements. The influence of risk premia needs to be understood in conjunction with the macroeconomic environment. One other important pattern in the data is an interaction between high-frequency variation in bond risks and the lower-frequency sign change in bond risks. Relying primarily on the post-2000 period, Laarits (2020) among others has documented that when risk premia, as captured by various macroeconomic and financial indicators, are low, this increases the bond-stock beta. To the best of our knowledge, we newly document that the relationship between risk premia and bond-stock betas changed around 2000, just as the lower-frequency level of bond-stock comovements switched from positive to negative.

We use two empirical proxies for low risk premia. The macroeconomic indicator, surplus consumption, is motivated by the model of Campbell and Cochrane (1999), while the financial indicator, the price-dividend ratio, reflects the present value logic of Campbell and Shiller (1988) that stock prices should be high when risk premia, for whatever reason, are low.[5]

[5]The intuition of surplus consumption is that when investors evaluate consumption relative to a slowly-moving habit that depends on past consumption, a low level of consumption relative to habit raises the level and volatility of investor risk aversion. We follow the simplified empirical implementation described in Cochrane (2017).

Table 1. Bond-Stock Betas onto Measures of Risk Aversion by Subperiod. This table reports univariate predictive regressions of the US real log surplus consumption or the US log price-dividend ratio for moving average bond-stock beta over the next 12 quarters. Constants are suppressed. Newey-West t-statistics with bandwidth 13 in parentheses.

Panel A: US

	1969.Q4-1999.Q4			2000.Q1-2022.Q1		
	Nominal	Real	Inflation	Nominal	Real	Inflation
Surplus consumption	-3.96**			2.08*	1.29	0.79*
	(-2.15)			(1.67)	(1.48)	(1.79)
R^2	0.15			0.18	0.13	0.19
Price-dividend ratio	-0.36***			0.70***	0.48***	0.22**
	(-2.06)			(2.66)	(2.65)	(2.29)
R^2	0.12			0.30	0.27	0.22
Obs.	121			89	89	89

Panel B: UK

	1983.Q2-1999.Q4			2000.Q1-2022.Q1		
	Nominal	Real	Inflation	Nominal	Real	Inflation
Surplus consumption	-6.29**	-2.37***	-3.95*	1.13	0.49	0.63**
	(-2.32)	(-3.04)	(-1.89)	(1.41)	(0.72)	(1.98)
R^2	0.25	0.34	0.20	0.10	0.02	0.27
Price-dividend ratio	-0.65***	-0.11	-0.50***	0.34	0.21	0.13**
	(-2.89)	(-1.22)	(-3.32)	(1.51)	(0.99)	(2.23)
R^2	0.35	0.10	0.41	0.13	0.05	0.17
Obs.	67	67	67	89	89	89

Table 1 shows that before 2000, when average bond-stock betas were positive, they tended to decrease when risk premia were low, as captured by high surplus consumption or a high price-dividend ratio, and increase when risk premia were high; after 2000, when average bond-stock betas were negative, they tended to become even more negative when risk premia were high. In both cases, periods with high risk premia tended to amplify the absolute value of bond-stock betas. The results are remarkably consistent across the real and inflation components of bond-stock betas, across the two proxies for risk premia, and for the US (Panel A) and the UK (Panel B). As we shall see, there is a natural explanation for these patterns.

Overall, the findings in Table 1 suggest that changes in risk aversion or background risk do not always have the same effect on bond-stock betas. They can sometimes act as "hedging premium" but at other times as "common risk premium" shocks using the terminology of Cieślak and Pang (2021). It is therefore important to understand how "flight to safety," a shift in investor demand away from risky assets, interacts with fundamental macroeconomic risks.

2 Models of Bond-Stock Betas

We now survey the models that have been used to understand changing bond-stock comovements. We start as generally as possible by linking real bond risks to the dynamics of the real stochastic discount factor (SDF) and nominal bonds to the real SDF and inflation. We then link these dynamics to the macroeconomy via consumption-based preferences. A central insight is that the covariance between consumption growth and inflation is predicted to be inversely related with the bond-stock covariance and nominal bond risk premia. We show how time-varying risk aversion can amplify the comovement of bonds and stocks dictated by the comovement of their real cash flows. Finally, we discuss how real and nominal bond-stock betas can be linked to fundamental driving forces of the economy, including monetary policy, supply shocks, and wedges between the interest rates faced by households and the rates set in financial markets.

In section 2.1 we consider models of the SDF, deriving implications for real bonds in section 2.1.1 and nominal bonds in section 2.1.2. In section 2.2 we discuss consumption-based models, starting with a homoskedastic model with Epstein-Zin preferences in section 2.2.1 and then allowing additional shocks or wedges to enter the Euler equation in section 2.2.2. We focus on factors that may alter risk premia in section 2.2.3.

While some useful insights can be gained by treating the inflation process in reduced-form, New Keynesian models with production and monetary policy allow us to examine the fundamental macroeconomic drivers of bond risks. We discuss these models in section 2.3.

2.1 Bonds and the SDF

We use upper case letters to denote levels of variables, and lower case letters for logs. A superscript \$ denotes nominal bonds, and a superscript P denotes a perpetuity that makes an equal payment in each period. We use a tilde to denote innovations, i.e., the difference between a $t+1$ realization and the conditional expectation at time t.

2.1.1 Real Bonds and the SDF

The SDF framework is the most general approach to classical financial modeling. The existence of a positive SDF is guaranteed merely by the absence of arbitrage, without the need for more specific assumptions about market equilibrium. Risk premia on all assets are determined by their covariance with the SDF. Specifically, we have

$$\frac{\mathrm{E}_t\left[R_{i,t+1}-R_{f,t+1}\right]}{\sigma_t(R_{i,t+1}-R_{f,t+1})} = -\mathrm{Corr}_t(M_{t+1},R_{i,t+1}-R_{f,t+1})\frac{\sigma_t(M_{t+1})}{\mathrm{E}_t\left[M_{t+1}\right]}, \tag{1}$$

where $R_{i,t+1}$ is the return on asset i from time t to time $t+1$ and M_{t+1} is the SDF at time $t+1$.

Hence, an asset with a high Sharpe ratio (the left-hand side of equation (1)) must have a large negative correlation with the SDF on the right-hand side of the equation. (The ratio of the volatility of the SDF to its mean also appears on the right-hand side, but is common to all assets.) Since stocks appear to have a high Sharpe ratio, they are likely to be highly negatively correlated with the SDF; so the correlation of other asset returns with stocks is often treated (up to a sign change) as a proxy for the correlation of these assets with the SDF. We follow this approach in this section, although we acknowledge that it may fail if stock returns have an important unpriced component that is strongly correlated with the returns on other assets.

The SDF approach is particularly helpful for understanding real bonds, because the price of a real bond of any maturity just equals the conditional expectation of the SDF at that maturity. Writing $P_{n,t+1}$ for the price of an n-period real bond at time $t+1$, we have

$$P_{n,t+1} = \mathrm{E}_{t+1}[M_{t+2}M_{t+3}...M_{t+n+1}] = \mathrm{E}_{t+1}[M_{t+1,t+n+1}]. \tag{2}$$

and

$$\widetilde{P}_{n,t+1} = P_{n,t+1} - \mathrm{E}_t P_{n,t+1} = (\mathrm{E}_{t+1} - \mathrm{E}_t)[M_{t+1,t+n+1}]. \tag{3}$$

Hence

$$\mathrm{Cov}_t(P_{n,t+1}, M_{t+1}) = \mathrm{Cov}_t((\mathrm{E}_{t+1} - \mathrm{E}_t)M_{t+1,t+n+1}, M_{t+1}). \tag{4}$$

The conditional covariance between the one-period-ahead price of an n-period bond and the SDF is the conditional covariance between the SDF and revisions of expectations of future values of the SDF. If the SDF is positively serially correlated, so that a positive innovation in the SDF today increases expectations of the SDF in the future, then real bonds are positively correlated with the SDF. This means that they are negatively correlated with stocks and are safe assets that hedge other risks; accordingly, they carry a negative risk premium. Conversely, if the SDF is negatively serially correlated, then real bonds are negatively correlated with the SDF and positively correlated with stocks: they are risky assets with a positive risk premium.[6]

2.1.2 Nominal Bonds, Inflation and the SDF

Nominal bonds further depend on inflation, and inflation dynamics hence affect their prices and risk premia. We consider a two-period nominal bond and for simplicity assume that the one-period nominal bond yield equals the one-period real yield plus expected inflation.[7] Since the real payoff on a two-period nominal bond at time $t+1$ is the nominal price of a one-period nominal bond divided by inflation, the innovation in the real return on a two-period nominal bond can be written as

$$\widetilde{r}^{\$}_{2,t+1} = \widetilde{r}_{1,t+2} + \widetilde{\pi}_{t+1} + (\mathrm{E}_{t+1} - \mathrm{E}_t)\pi_{t+2}. \tag{5}$$

It follows that the risk premium on a two-period nominal bond—or the expected return in excess of a one-period real bond adjusted for Jensen's inequality—is proportional to the covariance of these return elements with the log SDF:

$$\mathrm{E}_t\left(r^{\$}_{2,t+1} - r_{1,t+1}\right) + \frac{1}{2}\mathrm{Var}_t r^{\$}_{2,t+1} = \mathrm{Cov}_t\left(m_{t+1}, r_{1,t+2} + \pi_{t+1} + E_{t+1}\pi_{t+2}\right). \tag{6}$$

[6]This logic is extended in the canonical work of Alvarez and Jermann (2005) to show that the expected return on a real bond with an arbitrarily long maturity is informative about the relative volatility (or more generally entropy) of the permanent and transitory components of the SDF.

[7]This simplification, sometimes known as the Fisher equation, amounts to abstracting away from the risk premium in the one-period nominal bond so as to simplify the analytical expression for the risk premium in long-term bonds.

In equation (6), the covariance between the log real SDF and the log real rate $r_{1,t+2}$ captures the real rate dynamics as in Section 2.1.1. But in addition to real rate dynamics, inflation dynamics also affect the pricing of nominal bonds. In particular, if realized current or expected future inflation are positively correlated with the log real SDF m_{t+1}, real payoffs on nominal bonds are low precisely when the SDF is high, leading investors to require a higher nominal bond risk premium. Conversely, when inflation and inflation expectations are negatively correlated with the log SDF, nominal bonds are hedges and investors are willing to hold them at a low or even negative risk premia.

2.2 From the SDF to Consumption Growth

So far, we have considered a general SDF, for which it is sufficient to assume no arbitrage. In order to understand bond-stock comovements in relation to the macroeconomy, it is crucial to link the SDF to the Euler equation of a representative investor. Several approaches, including Epstein-Zin preferences, habits, and—as a special case—power utility, provide useful insights.

2.2.1 Epstein-Zin Preferences

Consumption-based asset pricing models derive both the SDF and stock returns from assumptions about the preferences of a representative investor and the dynamics of aggregate consumption. Consumption is treated as exogenous in these models, but the conclusions will be unchanged even if consumption is the endogenous result of production decisions, provided that the stochastic process for consumption is correctly modeled.

A leading paradigm in consumption-based asset pricing assumes that a representative investor has Epstein-Zin preferences, with a constant time discount factor δ, a constant coefficient of relative risk aversion γ, and a constant elasticity of intertemporal substitution ψ. The special case of power utility corresponds to the restriction that $\gamma = 1/\psi$.[8]

This model is particularly tractable if one makes the further assumptions that aggregate consumption is conditionally log-normally distributed and homoskedastic. In this case, a standard Campbell and Shiller (1988) approximation to Epstein-Zin marginal utility shows that the innovation in the log SDF, written $\widetilde{m}_{t+1}$ where the lower-case m denotes the log of the SDF and the tilde denotes the innovation, is given by

[8] The long-run risk model of Bansal and Yaron (2004) assumes Epstein-Zin preferences with $\psi > 1$, persistent shocks to consumption growth, and persistent shocks to the volatility of consumption growth. We discuss the first two ingredients in this subsection and the third in the next subsection.

$$\widetilde{m}_{t+1} = -\gamma\,\widetilde{c}_{t+1} - \left(\gamma - \frac{1}{\psi}\right)\widetilde{g}_{t+1}. \tag{7}$$

Here $\widetilde{c}_{t+1}$ is the innovation in consumption at time $t+1$, and $\widetilde{g}_{t+1}$ is the revision in expectations of future consumption growth:

$$\widetilde{g}_{t+1} = (\mathrm{E}_{t+1} - \mathrm{E}_t)\sum_{j=1}^{\infty}\rho^j \Delta c_{t+1+j}. \tag{8}$$

With Epstein-Zin utility, marginal utility moves not only with current consumption innovations but also with revisions in long-run expected future consumption growth. Whenever $\gamma > 1/\psi$, an increase in expected future consumption growth lowers marginal utility.[9]

The same loglinear approach shows that a levered claim to consumption that pays a log dividend $d_{t+1} = \lambda c_{t+1}$ has a return innovation

$$\widetilde{r}_{\lambda,t+1} = \lambda\widetilde{c}_{t+1} + \left(\lambda - \frac{1}{\psi}\right)\widetilde{g}_{t+1}. \tag{9}$$

Shocks to current consumption and expected future consumption growth have a direct cash-flow effect proportional to λ, and shocks to expected future consumption growth have an indirect discount-rate effect proportional to $-1/\psi$. If we interpret stocks as a levered consumption claim, then equations (7) and (9) show that stocks will have a strong negative correlation with the SDF and a correspondingly high Sharpe ratio provided that $(\gamma - 1/\psi)$ and $(\lambda - 1/\psi)$ have the same sign. This is plausible when γ and λ are both well above one and ψ is close to one.

A real perpetuity, paying one unit of real consumption in each period, can be regarded as the limiting case of a levered consumption claim where leverage goes to zero. Writing the return innovation on a real perpetuity as $\widetilde{r}^P_{t+1}$ and setting $\lambda = 0$ in equation (9), we have

$$\widetilde{r}^P_{t+1} = -\left(\frac{1}{\psi}\right)\widetilde{g}_{t+1}. \tag{10}$$

When $\lambda - 1/\psi$ is positive, equations (9) and (10) imply that real bonds and stocks will be negatively correlated with one another unless current shocks to real consumption $\widetilde{c}_{t+1}$ are negatively correlated with revisions in expected future consumption growth $\widetilde{g}_{t+1}$, that is, unless consumption growth is mean-reverting. The intuition is that upward revisions in expected consumption growth are good for stocks (through the expected cash-flow channel) and bad for real bonds (through the interest-rate channel), and so stocks and real bonds

[9] For a textbook exposition, see Campbell (2018), pages 180-181.

can only move together if a consumption boom today (which is good for stocks through the current cash-flow channel) is expected to be followed by slow future consumption growth (which is good for bonds through the interest-rate channel).[10]

Consistent with this, Chernov et al. (2025) presents evidence that the persistence of aggregate US consumption growth increased around the time that the comovement between real bonds and stocks changed from positive to negative. Using a discrete-state Markov switching model with three regimes—one with persistent consumption growth, one with mean-reverting consumption growth, and one "rare disaster" regime with extreme mean-reversion—the paper finds that the US economy shifted from the second regime to the first in the late 1990s.

This analysis can be extended to consider nominal bonds (Piazzesi and Schneider, 2006; David and Veronesi, 2013).[11] Write $\widetilde{\pi}_{t+1}$ for the innovation in inflation at time $t+1$, and define

$$\widetilde{b}_{t+1} = (\mathrm{E}_{t+1} - \mathrm{E}_t) \sum_{j=1}^{\infty} \rho^j \pi_{t+1+j}. \tag{11}$$

The use of the letter b in this notation refers to breakeven inflation, since in a homoskedastic model with constant risk premia innovations in expected future inflation are equivalent to innovations in breakeven inflation.

The return on a nominal perpetuity, $\widetilde{r}^{\$P}_{t+1}$, is given by

$$\widetilde{r}^{\$P}_{t+1} = \widetilde{r}^{P}_{t+1} - \widetilde{\pi}_{t+1} - \widetilde{b}_{t+1}. \tag{12}$$

Equation (12) shows that nominal bonds can be positively correlated with stocks if real bonds are positively correlated with stocks, or if shocks to current and expected future inflation are negatively correlated with shocks to current and expected future consumption growth: that is, if current and breakeven inflation are countercyclical.

Some long-run theories of price determination do suggest countercyclical inflation. For example, the fiscal theory of the price level (Cochrane (2001, 2023)) draws attention to the identity that the market value of the government debt must equal the discounted present value of the primary surpluses that service it. If primary surpluses increase with output (because tax revenues increase with output more strongly than government spending does), and if consumption also increases with output, then the market value of the debt will be positively correlated with current and expected future consumption. Given predominantly nominal government debt, this is likely to imply a price level that is negatively correlated

[10] Campbell (1986) presented an early version of this analysis assuming power utility and a univariate stochastic process for consumption growth.

[11] For a textbook exposition, see Campbell (2018), pages 256–257.

with the level of expected future consumption, or equivalently countercyclical inflation (see also Jiang et al. (2024)).

From a shorter-term perspective, inflation may be countercyclical if the economy experiences supply shocks (such as the oil shocks of the 1970s and early 1980s) that lower output and raise prices—especially if strongly anti-inflationary monetary policy drives the economy into recession in response to these shocks. Conversely, inflation may be procyclical if it is demand-driven. We explore this mechanism in greater detail in the next section. Empirically, Campbell et al. (2020) document that realized inflation shifted from countercyclical to procyclical around the turn of the millennium, consistent with the importance of this mechanism.

2.2.2 Wedges in the Consumption Euler Equation

The model in the previous subsection implies an Euler equation that tightly links current and expected future consumption, on the one hand, and bond and stock prices on the other hand. However many models imply that there may be additional wedges in the Euler equation. In the simple power utility case, for example, we may have

$$c_t = E_t c_{t+1} - \psi r_{1,t+1} + v_{x,t}, \tag{13}$$

The expression (13) ignores terms that are constant in a homoskedastic model, such as precautionary savings. Here, $r_{1,t+1}$ is the real interest rate (the real risk-free return known at time t), and $v_{x,t}$ represents a wedge in the relationship between the real interest rate and expected consumption growth.[12]

Several types of wedges—sometimes called demand shocks in macroeconomics—have been proposed in the literature. In international economics, the US dollar is often assumed to have a special convenience yield, defined as any component of the Treasury bill yield that is not consistent with the risk of Treasury bills and the cross-sectional pricing of risk (Kekre and Lenel (2024); Jiang et al. (2024); Hébert et al. (2023)).[13] Cieślak et al. (2024) argue that a decline in Treasury bond convenience can act as a demand shock and thereby partly drive bond-stock comovements. Alternatively, a demand shock can be microfounded as a shock to optimism or growth expectations, similar to expectations-based demand shocks in Beaudry and Portier (2006), Bordalo et al. (2024) and the "traditional financial forces"

[12] Duffee (2023) documents volatility in the relationship between macroeconomic forecasts and real interest rates, supporting the idea that a volatile wedge exists in equation (13).

[13] A growing literature has analyzed the drivers of convenience yields, including liquidity, financial regulation of intermediaries, and the demand for Treasury bills by foreign central banks (Krishnamurthy and Vissing-Jorgensen (2012); Du et al. (2018); He et al. (2022); Du et al. (2023)).

shock in Caballero and Simsek (2022a). Pflueger et al. (2020) document that perceptions or preferences for risk in the cross-section of stocks act similarly to such a demand shock, with higher risk perceptions being associated with a lower real risk-free rate, and predicting declines in real investment and the business cycle.

When consumption is endogenous, a positive demand shock on the right-hand side of (13) drives up consumption and hence the dividends on stocks. If the shock does not affect the discount rates investors apply to dividends, or if it even reduces them by reducing the equity risk premium, it will therefore increase stock valuations. At the same time, a positive demand shock drives up the real interest rate and drives down real bond prices. Volatility of demand shocks is then a potential explanation for the negative real bond-stock comovement observed since 2000.[14]

A decline in the rate of time preference—a "pure discounting" shock—can also increase current consumption at a given risk-free real rate and appear in equation (13) as a positive $v_{x,t}$. However, a pure discounting shock has different implications for bond-stock comovements because it affects the discount rates applied to equity dividends as well as the levels of those dividends. Stocks and long-term real bonds are both long-term claims whose values tend to increase when the rate of time preference declines. Gormsen and Lazarus (2025) argue that these channels are relevant to explain longer-term upward drifts in stock and bond prices. Volatile pure discounting shocks tend to imply positive comovement between real long-term bonds and stocks, consistent with late 20th Century but inconsistent with early 21st Century data.[15]

A behavioral model that has a similar effect is the model of inflation illusion proposed by Modigliani and Cohn (1979) and further explored by Campbell and Vuolteenaho (2004). In that model, equity investors discount real equity dividends at nominal interest rates. This implies that a rise in inflation, which drives up nominal bond yields, also increases equity discount rates and leads to positive comovement between stocks and nominal bonds. Inflation illusion is a rare example of a behavioral mechanism potentially affecting bond-stock comovements; in general, this phenomenon has been little studied in the behavioral finance literature.

[14] An interesting avenue for future research is to understand to what extent demand shocks to the Euler equation can serve as the fundamental for the changes in consumption dynamics documented by Chernov et al. (2025).

[15] Albuquerque et al. (2016) show with Epstein-Zin preferences, discount rate shocks imply positive comovements between real bond returns and stock returns and generate an upward-sloping term structure, different from growth shocks in a typical long-run risk model.

2.2.3 Amplification through Changing Risk Premia

So far, we have seen that the macroeconomic driving process for consumption and potential Euler equation wedges matter for real bond-stock comovements, while inflation-consumption comovements matter for the inflation component of bond-stock betas. We now turn to the role of time-varying risk premia, motivated by the evidence in Table 1.

The endogenous "flight to safety" mechanism can be understood most simply by considering comparative statics with respect to risk aversion γ in the expression for the two-period nominal bond risk premium (6) in the simplified case with power utility:

$$\mathrm{E}_t\left(r^{\$}_{2,t+1} - r_{1,t+1}\right) + \frac{1}{2}\mathrm{Var}_t r^{\$}_{2,t+1} \quad = \quad -\gamma \times \mathrm{Cov}_t\left(c_{t+1}, r_{1,t+2} + E_{t+1}\pi_{t+2} + \pi_{t+1}\right). \quad (14)$$

The three terms on the right-hand side of (14) can be mapped into the decomposition of the bond-stock covariance into real and inflation components. The real rate $r_{1,t+2}$ on the right-hand side corresponds to the real rate-consumption covariance, while $E_{t+1}\pi_{t+2}$ and π_{t+1} correspond to the covariances of expected and realized inflation with consumption. More sophisticated models model risk aversion or the volatilities of shocks as stochastic processes, but the basic insights can be gained by considering permanent changes in these parameters.

To understand how time-varying risk aversion amplifies bond-stock comovements, consider first the case where the covariance on the right-hand side of (14) is negative. This could be due to inflation or real rates falling when consumption is low, or both. In this case, investors are willing to hold bonds at a negative risk premium, which becomes more negative as risk aversion γ increases. At the same time, an increase in risk aversion raises the stock risk premium, which is characterized by an expression similar to (14) with a positive comovement with consumption on the right-hand side.[16] As risk aversion increases, bond risk premia decline further while stock risk premia increase, resembling a "flight to safety" towards safe bonds and away from risky stocks. Baele et al. (2010), Kozak (2022), and Laarits (2020) emphasize flight to safety of this sort, which drives the prices of stocks and nominal bonds in opposite directions.

This effect reverses when the covariance on the right-hand side of (14) is positive. In that case, an increase in risk aversion raises risk premia on both bonds and stocks simultaneously, driving down their prices together. Flight to safety no longer benefits bonds; instead, investors flee from both stocks and bonds towards short-term safe assets. Bonds may either benefit or suffer from "flight to safety", depending on the macroeconomic dynamics.

[16] As we do elsewhere in this article, we treat stocks as an asset highly correlated with consumption. Empirically, this correlation has been found to be lower than predicted by theory at a quarterly horizon (Campbell (2000)), though it is higher at longer horizons (Parker (2003), Parker and Julliard (2005)).

Volatile risk aversion unambiguously amplifies the covariance between bonds and stocks—increasing its absolute value by moving it away from zero—as shown by Campbell et al. (2020). For bond-stock betas, there are opposing effects as a higher volatility of γ makes the covariance more negative, but also increases the volatility of stock returns. In Campbell et al. (2020), these opposing effects imply that bond-stock betas are not amplified. However, one could imagine an even stronger version of this mechanism, where the comovement between bonds and stocks is amplified more than the variance of stock returns, maybe because stock return volatility also exhibits unrelated short-term spikes, in which case bond-stock betas could be amplified when risk aversion is more volatile. This would explain the novel evidence for bond-stock beta amplification presented in Table 1.

Time-varying risk aversion can be microfounded in several different ways. It might be a property of investor preferences, as in the habit formation models of Campbell and Cochrane (1999) and Campbell et al. (2020), but it could also arise from changes in intermediaries' risk-bearing capacity as in models where the demands of end investors are accommodated by leveraged intermediaries (e.g. He and Krishnamurthy (2013), Vayanos and Vila (2021)). With a few exceptions, such as He et al. (2022), there is relatively little research linking bond-stock comovements to intermediaries, perhaps because government bonds and stocks are often held directly by households (Haddad and Muir (2021)). However, Parker et al. (2023) point out that the growth of automatically rebalancing target date funds, increasingly used by households as vehicles for their bond and stock holdings, may alter the dynamics of stock and bond prices. This is a topic that deserves further research.

While the discussion above refers to time-varying risk aversion, a similar mechanism operates if risk aversion is constant but volatilities are time-varying (e.g. Bekaert et al. (2009), Bansal and Shaliastovich (2013), Jurado et al. (2015)). Quantifying the relative contributions of time-variation in risk aversion and in volatilities is another fruitful research topic.

The lesson of this analysis is that whether flight to safety benefits bonds depends on the fundamental macroeconomic environment. Cieślak and Pang (2021) and Antolín-Díaz (2024) argue that bond-benefiting flight to safety has become more important since the turn of the millennium. This can be understood as a result of shocks to risk aversion or volatilities interacting with the lower-frequency change in bonds' real cash flow risks since 2000.

2.3 Models with Production and Monetary Policy

While a consumption-based model can explain bond-stock comovements given consumption and inflation dynamics, a deeper question concerns the drivers of these dynamics. New

Keynesian models with monetary policy, price- or wage-setting frictions, and endogenous production can help answer questions such as: How do supply and demand shocks affect bond-stock comovements? How should changes in the perceived monetary policy rule affect these comovements? And what do the responses of bonds and stocks to FOMC announcements tell us about the inferences investors make from announcements?

2.3.1 The Basic New Keynesian Model

We begin with a short exposition of the macroeconomic side of a typical monetary asset pricing model. To keep things simple, we go straight to the three log-linearized equations describing output, inflation, and interest rate dynamics in a small-scale New Keynesian model (presented up to constants):[17]

$$\textbf{Euler Equation:} \quad x_t = (1-\rho^x)E_t x_{t+1} + \rho^x x_{t-1} - \psi r_{1,t+1} + v_{x,t}, \tag{15}$$

$$\textbf{Phillips Curve:} \quad \pi_t = \kappa x_t + (1-\rho^\pi)\, E_t \pi_{t+1} + \rho^\pi \pi_{t-1} + v_{\pi,t}, \tag{16}$$

$$\textbf{Monetary Policy Rule:} \quad i_t = \rho^i i_{t-1} + (1-\rho^i)\,(\gamma^x x_t + \gamma^\pi \pi_t) + v_{i,t}, \tag{17}$$

The real risk-free rate and the nominal policy rate are linked via the Fisher equation

$$i_t = r_{1,t+1} + E_t \pi_{t+1}, \tag{18}$$

which is the Euler equation for the nominal one-period bond, abstracting away from the risk premium on the short-term nominal bond.

Here, x_t denotes the output gap, or log real output relative to a flexible price benchmark, and is the main indicator of whether the economy is in an expansion or a recession. The simplest models also assume that consumption and output are conditionally perfectly correlated, so innovations to x_t are also innovations to real consumption.

The Euler equation (15) is a generalized version of the first-order condition for the one-period real risk-free bond (13), except that consumption and output in this broader model are endogenous rather than exogenous. The endogenous output response to the interest rate captures the effect of monetary policy, whereby raising interest rates increases the incentive to save and decreases the incentive to borrow, thereby reducing consumption in the current period. The backward-looking term on the right-hand side of (15) is needed to generate meaningful macro dynamics and, in particular, the hump-shaped output decline after a surprise interest rate increase (Fuhrer, 1997). This term can arise from external

[17] Full microfoundations can be found in textbooks such as Galí (2015) and Woodford (2003a), and the review article Clarida et al. (1999).

consumption habits (Fuhrer, 2000) or sticky information (Mankiw and Reis, 2002; Auclert et al., 2020). As discussed in section 2.2.2, the demand shock $v_{x,t}$ represents anything that can increase consumption and output at a given risk-free rate, such as a shock to the demand for safe assets or a change in credit market frictions.

The Phillips curve (16) follows from firms' optimal price-setting and production decisions when opportunities to revise prices are infrequent (Calvo (1983)). The backward-looking term may represent the dependence of inflation expectations on past realized inflation, or price indexation to past inflation. The supply (or so-called cost-push) shock $v_{\pi,t}$ captures any disturbance to the relationship between the output gap and marginal costs of production, such as increases in wage bargaining power, changing optimal markups due to partially monopolistic competition, or shocks to long-term inflation expectations driven by fiscal or other considerations.[18]

In most small-scale New Keynesian models, monetary policy is described as an interest rate rule in the tradition of Taylor (1993), whereby the nominal policy rate increases in the output gap x_t and inflation π_t, with coefficients γ^x and γ^π. Much theoretical and empirical research has documented the relevance of interest-rate smoothing and policy gradualism that generate inertia captured by the coefficient ρ^i (e.g. Woodford (2003b), Bernanke (2004), Taylor and Williams (2010), Stein and Sunderam (2018)). Together, the output weight γ^x, inflation weight γ^π, and policy inertia ρ^i describe the systematic component of monetary policy. The monetary policy shock $v_{i,t}$ represents unexpected transitory deviations from this systematic monetary policy.[19]

In the three-equation New Keynesian model, a positive demand shock $v_{x,t}$ leads to an increase in the output gap. Because the output gap enters on the right-hand side of the Phillips curve, inflation and hence nominal interest rates also increase. In the terminology of Cieślak and Pflueger (2023), a positive demand shock hence generates "good" inflation, which is associated with an economic expansion, and leads to negative bond risk premia through (14). By contrast, a positive supply shock v_{π_t} leads to an increase in inflation and nominal interest rates, and often—though not always—a decline in the output gap. A supply shock hence has the potential to generate "bad" inflation and positive nominal bond risk premia through (14). The fall in output in response to an adverse supply shock, however, also depends on the monetary policy response (Bernanke et al. (1997)). Finally, a negative monetary policy shock $v_{i,t}$ typically leads to a decline in nominal and real short-term interest rates, an increase in the output gap, and—through the Phillips curve—higher inflation. It

[18]See Hazell et al. (2022), Bianchi et al. (2023) for US evidence and theory on shifting inflation expectations.

[19]Potential microfoundations for such shocks can be disagreements about underlying demand conditions (Caballero and Simsek (2022b); Nakamura and Steinsson (2018)) or gaps between the actual and perceived monetary policy reaction function (Bauer and Swanson (2023); Bauer et al. (2024)).

therefore generates "good" inflation. However, different from a demand shock, a monetary policy shock tends to generate a negative real rate-consumption correlation, driving bond risk premia up through the real component in (14).

The basic New Keynesian model can be augmented with a random walk component in the intercept of the monetary policy rule, capturing permanent shifts to the central bank inflation target. A permanent decline in the monetary policy intercept drives down both inflation and the nominal rate through the Fisher equation, and leads to a recession through the standard channels linking inflation and output in the New Keynesian model. Cochrane (2018) and Schmitt-Grohé and Uribe (2022) have investigated such shocks in the context of the zero lower bound on the nominal interest rate, emphasizing the initially counterintuitive implication that permanently lower nominal interest rates can lead to lower inflation and output. Investigating the implications for stocks and breakeven inflation in the bond market would be a useful extension of this research, since expectations are critical for this channel and for the behavior of asset prices.

It is important to remember that the state variables on the left-hand side of the New Keynesian equations do not directly respond to the exogenous shocks, as state variables and expectations are jointly endogenously determined. The joint determination of all three variables can lead to multiple equilibria, potentially influenced by sunspots (Cochrane (2011)), particularly when the inflation coefficient γ^{π} is less than one and nominal rates rise less than one-for-one with inflation (Clarida et al. (2000)). These unresolved issues are broadly present for New Keynesian models and are not specific to models with asset prices. We therefore describe merely the properties of a minimum state variable solution when the inflation coefficient is greater than one, and leave the question of equilibrium determination with potentially more state variables to future research. To the extent that asset prices are informative about expectations, one question for future research is whether bond-stock comovements can be informative for equilibrium selection.

In summary, the basic New Keynesian model provides insights about which economic shocks or policy expectations are likely to generate procyclical or countercyclical movements in inflation and real interest rates. These are key building blocks for bond-stock comovements.

2.3.2 Implications for Asset Prices

While the standard New Keynesian model generates implications for comovements between inflation, real interest rates, and consumption, it should not be surprising that the link to asset prices is substantially more complex. Bonds and stocks typically comove positively when inflation and real interest rates are countercyclical, and negatively when they are procyclical; but it is a more challenging task to capture the magnitudes of these comovements.

A long literature has documented that stock risk premia are too high and too volatile to be consistent with simple power utility and observed properties of consumption (e.g. Mehra and Prescott (1985), Shiller (1981), Campbell (2003)). These puzzles remain equally valid in production economies and are augmented by new ones, such as agents' ability to adjust labor supply when marginal consumption utility is high (Swanson (2012)). A first generation of papers linking general equilibrium New Keynesian models with asset prices noted several modeling challenges (Rudebusch and Swanson (2008); Uhlig (2007); Jermann (1998)). Reflecting these challenges, many traditional macroeconomic models, such as those used by central banks, bracket out asset prices altogether or treat them in a reduced-form fashion (e.g. Smets and Wouters (2007)).

Over time, several approaches integrating asset prices into New Keynesian models have yielded promising results. Rudebusch and Swanson (2012) consider a model with Epstein-Zin preferences and technology shocks. While this model does not directly speak to bond-stock comovements, it has interesting implications for bond term premia. An adverse technology shock in their model acts similarly to a supply shock in the New Keynesian model of the previous section, driving up inflation while driving down consumption and output. As a result, the implied nominal term premium is on average positive. The inflation-stabilizing properties of monetary policy are particularly important because long-run risks are priced. In particular, Rudebusch and Swanson (2012) find that when monetary policy responds to a persistent component of inflation rather than transitory inflation as formulated in (17), long-run inflation risks and nominal term premia are compressed towards zero. While slightly negative term premia are possible in this model, they are not the focus of the analysis and require monetary policy commitment to lowering long-term inflation after an inflationary technology shock.[20]

The traditional view that monetary policy has short- to medium-term economic effects makes it appealing to use a model in which asset prices respond to shorter-term fluctuations, and habit preferences are a prominent asset pricing model with this feature.[21] Pflueger and Rinaldi (2022) embed the highly non-linear external habit preferences of Campbell et al. (2020) into a three-equation New Keynesian model. They show that this can jointly explain the high volatility of stock returns, the high equity Sharpe ratio, and the large empirical

[20]See also Kung (2015) and Swanson (2021) for other models explaining the nominal term premium and other unconditional asset pricing moments in long-run risk models.

[21]Some papers assume an exogenous link between risk, uncertainty or ambiguity, and the state of the economy (e.g. Bianchi et al. (2018), Gourio (2012), Kilic and Wachter (2018), and Gourio and Ngo (2020)), which, however, might be sensitive to changes in the policy framework. Again, other papers, including Uhlig (2007), Dew-Becker (2014), Rudebusch and Swanson (2008), and Bretscher et al. (2023) have embedded simplified finance habit preferences into a standard New Keynesian model.

stock response to monetary policy surprises (Bernanke and Kuttner (2005), Nagel and Xu (2025)).

Within the New Keynesian asset pricing literature, one prominent approach has studied how changes in the monetary policy rule, or changes in shock transmission more broadly, have affected asset prices. One channel through which monetary policy can work is a simple discount rate channel, whereby a monetary policy rule with a higher loading on the output gap makes real interest rates more pro-cyclical and real bond returns more counter-cyclical. Bauer et al. (2024) measure the perceived monetary policy output gap coefficient from rich survey data, and show that it is negatively associated with subjective expected bond excess returns. Bianchi et al. (2022) show that a secular increase in monetary policy's weight on output can help understand the downward drift in long-term interest rates and, because stocks are long-term assets, also the secular increase in equity valuations.[22]

A second approach has emphasized the changing nature of economic shocks as a potential driver of changing bond stock comovements, corresponding roughly to changes in the volatilities of $v_{x,t}$, $v_{\pi,t}$ and $v_{i,t}$ in our simple setup. Campbell et al. (2020), Song (2017) and Bekaert et al. (2021) appeal to the intuition that supply vs. demand shocks should generate different inflation-consumption comovements, while keeping the inflation process exogenous.[23]

Pflueger (2025) considers simultaneous changes in the monetary policy rule and the nature of economic shocks, and finds that several factors need to coincide to generate the positive bond-stock betas of the 1980s. In particular, the positive inflation component of bond-stock betas at that time can only be explained if a) there was substantial uncertainty about inflationary supply-type shocks; and b) monetary policy was anticipated to react to these inflationary shocks strongly and quickly. The intuition goes back to the comovement between consumption and inflation in equation (14), combined with the macroeconomic insight that a quick and strong monetary policy hike in response to an inflationary shock is liable to generate a recession (Bernanke et al. (1997)). Because higher expected inflation lowers the real value of nominal bonds, an inflationary supply shock with a strong monetary policy response drives down bonds and stocks simultaneously and generates positive bond-stock betas, which are amplified by time-varying risk premia.[24]

[22] See Gourio and Ngo (2020) for a model with a changing Phillips curve and Li et al. (2022) for a change between monetary and fiscal dominance as potential drivers for bond-stock comovements, while holding shock processes invariant. Du et al. (2020) document substantial cross-country variation in local currency bond-stock betas for emerging markets and link this variation to monetary policy credibility.

[23] Fang et al. (2025) and Kozak (2022) model changes in the nature of shocks in general equilibrium while keeping monetary policy invariant. While Fang et al. (2025) focuses on the inflation component and oil price shocks, Kozak (2022) focuses on real bond-stock comovements and models different types of productive technologies.

[24] The risk premium amplification effect makes this approach consistent with Duffee (2011)'s evidence of low volatility of inflation expectations relative to bond yields ("inflation variance ratios").

3 Conclusion

We have reviewed the theoretical and empirical progress made towards understanding the comovement of bonds and stocks. Approaches based on reduced-form dynamics for real consumption growth and inflation yield useful predictions, although ultimately consumption and inflation are endogenous outcomes of economic shocks and policy choices.

We have emphasized that changes in the real cash flow risks of bonds are amplified by time-varying risk aversion or risk bearing capacity. We provide new evidence that negative bond-stock betas in the early 21st Century have been more negative when detrended consumption or stock prices suggest that risk aversion has been high; and that positive bond-stock betas in the late 20th Century were even more positive when these same indicators showed high risk aversion or low risk bearing capacity.

The interplay between bonds' real cash flow risks and time-varying risk premia has important implications. For example, the re-emergence of supply shocks and other uncertainties may make the real value of nominal bonds more volatile and riskier for investors. While the increased cash flow risk in nominal bonds may be small, this increase may easily be amplified when investors become reluctant to hold risky assets, and bonds no longer benefit from a flight to safety.

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