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Expected returns, risk and the integration of international bond markets

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Abstract

In this paper we model expected risks and returns on government bonds, allowing for partial integration of national and world bond markets. Using a conditional asset pricing model that permits variation in the price of, and exposure to, risk, we find strong evidence that national markets are only partially integrated into world markets. Around one quarter of total expected excess returns is related to local market risk; the remainder being due to world bond market risk. A range of parameter stability tests rejects the hypothesis of time-variation in the level of integration.
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1. Introduction

It is generally accepted that returns on tradable assets are predictable, and that a significant source of this predictability is the time-varying compensation that investors require for accepting a risky payoff. A related issue for assets that are traded internationally is the extent to which this compensation is driven by world, rather than domestic, factors i.e. the extent to which the domestic market is integrated into world markets. Several papers have investigated this issue, most of which focus on equity markets. In this paper we ask what can be learned from bond markets.

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Econometric models describing this predictability typically fall into either or both of two groups. The first employs "information variables" which, since they are jointly determined with asset prices, contain information about expected returns. The second uses explicit asset pricing models (APMs) to relate expected returns to measures of investor preferences, factor risks and asset specific factor loadings, or betas. Various instruments are used to capture changes in risk aversion, and to proxy the factors (Ferson and Harvey, 1991; Harvey et al., 1994), while ARCH processes are commonly used to model changes in asset betas (see Bollerslev et al., 1988). The challenge for the asset pricing models is to account for the predictability that is evident from the information-variable models.

One way forward is to assume that markets are fully integrated, and to test the restrictions generated by APMs: a rejection being interpreted as a rejection of the joint hypothesis of full integration and the APM (Dumas and Solnik, 1995). This integration assumption reflects a fundamental difficulty in international asset pricing however: while the information-variable approach embraces the possibility of partial integration without difficulty, current APMs can accommodate only the two extremes of integration or segmentation, and both of these will be rejected if markets are only partially integrated. Some combination of the polar models is required in order to deal with partially integrated markets. Errunza and Losq (1985), and Errunza et al. (1992) divide the available assets into those that are traded internationally, and those that trade only domestically. More-recent work, such as Bekaert and Harvey (1995, 1997) combines the polar models, and allows the level of integration to change over time.

Although most international-market studies have focused on equities, bonds do appear in several investigations, but rarely as the main focus. Exceptions are Ilmanen (1995, 1996), who finds evidence of predictability that is just as compelling as that for equity markets, Harvey et al. (1994), who find that the factors driving bond returns are the same as those driving equity returns, and Jorion (1992)[1]. Bollerslev et al. (1988) find a significant role for government bonds and bills, alongside equities, in a 3-asset conditional CAPM for the US, and Giovannini and Jorion (1989) include bonds in the world market portfolio.

There are many possible impediments to complete integration (see Jorion, 1992 for a wide-ranging discussion). These include legal restrictions, imperfect information, asymmetric treatment of withholding taxes and associated credits (Solnik, 2000), home bias, where investors fail to optimse over a worldwide portfolio even in the absence of institutional impediments to capital flows (Stulz, 1999) and local market conventions. For example, the timing of UK auctions of government stock was set on an ad-hoc basis during our sample; an arrangement that was designed to minimise funding costs, but which also reduced price volatility and risk. In Japan, the market for medium-term bonds tends to be less liquid than in other

[1] Jorion (1992) is actually a study of eurocurrency markets but we view these as being similar to short-maturity bonds.

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