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International bond market linkages: a structural VAR analysis

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Abstract

This paper examines linkages between government bond markets of five industrialized countries (US, Japan, Germany, UK and Canada) during the period of January 1986 to December 2000. Recursive cointegration analysis clearly shows that no long-run relationship exists among the five major bond markets during the sample period. The contemporaneous causal pattern of the strong correlations between bond market innovations is uncovered, building on the recent advance in vector autoregression analysis. The identification of such a contemporaneous causal pattern further improves the investigation of the dynamic linkage pattern, which is based on data-determined forecast error variance decomposition. A number of new empirical regularities on international bond market linkages have been documented.

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1. Introduction

The integration of international bond markets has been perceived to increase dramatically in the last two decades since government-imposed barriers to the international flow of capital in major industrialized countries was substantially eliminated by the early 1980s. The extent and the nature of linkages in international bond markets carry important implications for an

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independent monetary policymaking (e.g., Kirchgassner and Wolters, 1987; Sutton, 2000), modeling and forecasting long-term interest rates (e.g., DeGennaro et al., 1994), and bond portfolio diversification (e.g., Clare et al., 1995).

The theory does not provide unambiguous prediction on the extent and the nature of international bond market linkages. Bond yields or long-term interest rates can be viewed either as analogous to other assets prices or as policy instruments (Barassi et al., 2001). With substantially deregulated international financial markets and voluminous capital flows across borders, bond yields in different markets may be expected to move together to a certain extent, depending on the seriousness of the remaining barriers to market entry. Furthermore, the market-driven comovement of bond yields may be confounded by the degree of monetary policy independence sought by national authorities. Hence, the extent of international bond market linkages is essentially a matter of empirical testing.

Compared to a large body of literature on international stock market linkages (e.g., Eun and Shim, 1989; Arshanapalli and Doukas, 1993; Francis and Leachman, 1998; Bessler and Yang, 2003) and international money market linkages (e.g., Fung and Isberg, 1992; Fung and Lo, 1995), only very few empirical works have examined linkages in international bond markets. Applying a cointegration technique, DeGennaro et al. (1994) and Clare et al. (1995) did not find any long-run cointegration relationship among government bond markets of several major industrialized countries. By contrast, Barassi et al. (2001) and Smith (2002) reported existence of cointegration in these markets. Kirchgassner and Wolters (1987) found strong contemporaneous/instantaneous relationships and mild Granger causal linkages between US and two European government bond markets after 1980. Sutton (2000, p. 368) argued that bond yields display excessive comovements in major government bond markets, which may be captured by contemporaneous correlations between bond yield innovations. Obviously, the empirical findings are inconclusive and represent a number of different perspectives, thus calling for a more thorough analysis.

This paper more comprehensively examines international bond market linkages, including long-run cointegration relationships between bond yields, dynamic causal linkages between bond yield changes and contemporaneous relationships between bond yield innovations. The study contributes to the literature in several aspects. First, to shed light on the controversy over the (non)existence of cointegration in international bond markets, the stability of the long-run relationship is investigated by applying a recursive cointegration technique (Hansen and Johansen, 1993) to test how the (non)cointegration relationship holds at each point of time during the sample period. Such a consideration is important, as Elyasiani and Kocagil (2001) recently found that possible structural breaks in the (non)cointegration relationship may occur due to some significant events. Second, the important contemporaneous causal pattern of the strong correlations between market innovations is explored building on recent advances in vector autoregression (VAR) analysis (Swanson and Granger, 1997; Bessler and Yang, 2003; Haigh and Bessler, 2004; Yang, 2003). Kirchgassner and Wolters (1987, p. 679) noted that “the instantaneous relations (among bond yield innovations) are probably much more important than the simple Granger causal relations (in international bond markets)”. Similarly, in Sutton’s (2000) model, excessive bond yield comovements are characterized by significant and positive correlations between bond yield innovations

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