Emerging market economies and the world interest rate

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ABSTRACT

We use a Factor Augmented VAR model to estimate the dynamic responses of interest rates in emerging market economies to the 'world' interest rate, which we extract from a dynamic factor model of yields in industrialized countries. Our results provide evidence that many emerging market yields respond to world rate shocks, at least gradually, which is broadly consistent with capital market integration. Our findings also suggest that the world rate captures information about emerging market yields not contained in US rates, which are typically used to proxy for the world rate.

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1. Introduction

In this paper we study the extent to which emerging market economies are integrated into international capital markets. Under capital market integration, emerging market interest rates should respond to changes in the *world interest rate* – the rate that clears the global market for loanable funds. This implication that bond yields have a common component holds regardless of the role of country-specific shocks or whether strict bilateral interest rate parity conditions hold, and serves as the foundation for our empirical analysis.

Because the world rate is not observable, most studies related to this issue, such as those estimating the determinants of emerging market yield spreads, use US interest rates as a proxy. While this assumption is understandable given the role of the US in the world economy, it is typically made for

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convenience and justified neither theoretically nor empirically. Our approach in this paper is different. We use a dynamic factor model to estimate the world rate, which can systematically and parsimoniously capture information about the underlying global market for funds beyond what is contained in US rates. To the extent that US rates are driven by idiosyncratic shocks and not global ones, our approach has the potential to provide more precise estimates of the extent of capital market integration than previous studies.

Section 2 of the paper briefly describes the general equilibrium model of financial market integration in Bai and Zhang (2012), which motivates our dynamic factor model and provides a framework for interpreting the empirical results. We then estimate the factor model over a sample of interest rates from industrialized countries, under the presumption that this sample accounts for a large part of global finance, that financial markets in these countries are likely to have been closely integrated over the period of the study (1989 to 2014), and that the common dynamic factor plausibly represents the underlying world equilibrium interest rate and how it fluctuates over time. We describe the dynamic factor model in section 3 and extract our estimates of the world rate from the industrialized country sample in section 4. Although we allow for multiple common factors in the analysis, we show that our estimates of the world interest rate explain almost all of the common variation of yields in the sample. We also find that the spread between our estimated world rate and US rates exhibits significant variation.

Finally, in section 5 we use factor-augmented vector autoregression (FAVAR) models to estimate how emerging market yields dynamically respond to global shocks, with an eye toward the implications for capital market integration. Our FAVAR models include the estimated world interest rate from the dynamic factor model and emerging market interest rates. We estimate separate FAVARs for each of the forty emerging market interest rate series in our monthly sample, which includes both short-term and long-term yields, and yields denominated in local currency and in a common currency (US dollars). The estimated impulse response functions from this model provide evidence that many emerging market interest rates respond to world rate shocks, although perhaps with a lag, which is generally consistent with the implications of capital market integration. In addition, the world rate has explanatory power for many emerging market yields even after controlling for US yields; thus, using US rates as a proxy for global yields may not in general be justified.

Our approach and objectives have antecedents in the work of Barro and Sala-i Martin (1990), Gagnon and Unferth (1995), and Desroches and Francis (2010), each of which attempts to estimate a single world interest rate using methods similar to ours. Our paper extends their work by more thoroughly estimating the dynamics of the world interest rate, relying on a large and updated sample of countries, and, most importantly, using the estimates to gauge the extent to which emerging markets are integrated into world capital markets. Jaramillo and Weber (2013) rely on a common factor approach, as we do, to examine yields in emerging markets, but do not estimate a FAVAR; they focus primarily on estimating common factors across emerging markets and do not link interest rates in developed economies to developing economies.

Dynamic factor models (Stock and Watson, 2005, 2011) and FAVARs (Bernanke et al., 2005) are commonly used in macro time-series analysis, and are particularly well-suited to bringing lots of variables to bear in estimating a world interest rate and its dynamic effects. Although our topic is different, our approach is very similar to that taken by Del Negro and Otrok (2007), which exploits the same empirical framework to identify a national component to state-wide housing markets in the US much as we identify a global component to country-specific financial markets.

Our work is further related to the many studies on the determinants of sovereign bond yields and spreads in emerging markets, such as Akinci (2013), Uribe and Yue (2006), Longstaff et al. (2011) and Csonto and Ivaschenko (2013), which as noted above use US Treasury security yields as a proxy for world interest rates. This work is important for understanding the economic performance of the developing world, especially in light of Neumeyer and Perri (2005), which shows how important local interest rates are in linking those economies to the rest of the world. We also contribute to the extensive literature on international capital mobility and its many empirical predictions. Obstfeld (1993), although now dated, nicely lays out these implications and discusses pitfalls in testing, while Montiel (1993) discusses tests for capital mobility in emerging market countries. More recently, Chinn (2006) surveys tests for uncovered interest rate parity in emerging markets under floating rates, and Bai and