

Discussion of Baele, Bekaert, Inghelbrecht & Wei

Eric Ghysels

University of North Carolina

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- ▶ On average, FTS episodes comprise less than 5% of the sample, and bond returns exceed equity returns 2 to 3 %.
- ▶ Majority of FTS events are country-specific not global.
- ▶ FTS episodes coincide with increases in the VIX, decreases in consumer sentiment indicators in the US, Germany and the OECD and appreciations of the yen and the Swiss franc.
- ▶ Both money market instruments and corporate bonds face abnormal negative returns in FTS episodes. Most commodity prices decrease sharply during FTS episodes, whereas the gold price measured in dollars increases slightly.

Topics of Discussion

- ▶ Fight-to-safety: Is it there? (Borrowing from title *Stock return predictability: Is it there?*, Ang & Bekaert RFS, 2007).
- ▶ Flight-to-safety and flight-to-liquidity.

FTS: Is it there?

- ▶ Univariate Regime-Switching FTS Model - simplified example:

$$r_t^b - r_t^s = (\mu_0 + \mu_v \times S_t(v)) + (\sigma_0 + \sigma_v S_t(v))\varepsilon_t$$

- ▶ Where $S_t(v) = 1$ if FTS state.

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0	p	$1-p$
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- ▶ Unidentified p and q under $H_0 : (\mu_v, \sigma_v) = (0, 0)$.
- ▶ Non-standard asymptotics - known as the Davies problem.
- ▶ *LR* test does **not** have a $\chi^2(2)$ distribution.

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- ▶ Unidentified p and q under $H_0 : (\mu_v, \sigma_v) = (0, 0)$.
- ▶ One solution $Sup_{(p_i, q_i)} LR(p_i, q_i)$ test see e.g. Garcia (1998).
- ▶ Optimal tests see Carrasco, Hu and Ploberger (2012).

FTS: Is it there?

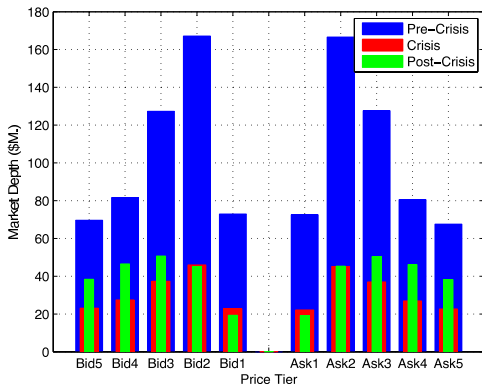
- ▶ This applies to both the univariate Regime-Switching FTS Model and the bivariate one.
- ▶ Taking for example the univariate case:

$$r_t^b - r_t^s = \mu_v + \sigma_v \varepsilon_t, \quad v = 1, 2, 3$$

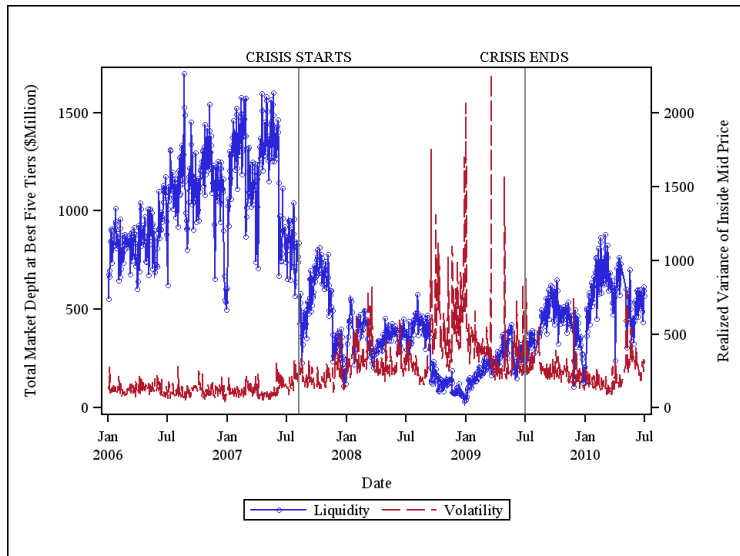
- ▶ Table 1: μ_3 significant at 10 % and σ_3 at 1 % for US.
- ▶ But critical values of non-standard distribution reported in Garcia (1998) suggests that neither may be significant. For example 5 % critical value corresponds roughly to .2 % critical value of standard asymptotic distribution.

Flight to Safety and Flight to Liquidity?

Limit-Order Book of Inter-dealer ECN BrokerTec US 10 YR Treasuries



Flight to Safety and Flight to Liquidity?



Safety with less liquidity?

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- ▶ Engle, Fleming, Ghysels and Nguyen (2012) [EFGN]: given major liquidity drops, a model must be able to accommodate zero or small values of depth with a reasonable probability mass.
- ▶ The typical linear Gaussian framework may produce negative depth. Log transformation is also problematic for predicting small values of depth as these are implicitly treated as extreme events (zero depth is not defined!) whereas empirical evidence tells us that small values of depth appear more common.

Safety with less liquidity?

- ▶ The key insight of EFGN is to make empirical limit order book models look much like asset price volatility models: (multivariate) positive-valued random processes with co-variate driven autoregressive dynamics (news impact curves, realized volatility of depth, etc.)

Safety with less liquidity?

- ▶ The key insight of EFGN is to make empirical limit order book models look much like asset price volatility models: (multivariate) positive-valued random processes with co-variate driven autoregressive dynamics (news impact curves, realized volatility of depth, etc.)
- ▶ When one adds Baele et al. FTS dummy to limit order book model for 2, 5, 10 YR Treasuries: the limit order book depth diminishes and the sell side diminishes more than the buy side.

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- ▶ Main contribution of the paper is a simple empirical characterization of FTS.
- ▶ Despite my comments about the formal econometric testing - I think the characterization of FTS episodes does appear to be genuinely identify periods of market stress.
- ▶ The limit order book example shows how the FTS indicator is useful in a broader context.