

FX market illiquidity and funding liquidity constraints

by Chiara Banti and Kate Phylaktis

Discussion by Hans Joergen Tranvaag

BoC Ottawa, October 26, 2012

The Paper

- **Aim:** Model the time-variation in FX **market** liquidity
- **Main question:** Is the time-variation in FX market liquidity due to changes in funding liquidity of financial intermediaries?

The Paper

- **Aim:** Model the time-variation in FX **market** liquidity
 - Previous studies on bid-ask spreads for individual currencies
- **Main question:** Is the time-variation in FX market liquidity due to changes in funding liquidity of financial intermediaries?

The Paper

- **Aim:** Model the time-variation in FX **market** liquidity
 - Previous studies on bid-ask spreads for individual currencies
 - More recently commonality in daily market liquidity
- **Main question:** Is the time-variation in FX market liquidity due to changes in funding liquidity of financial intermediaries?

The Paper

- **Aim:** Model the time-variation in FX **market** liquidity
 - Previous studies on bid-ask spreads for individual currencies
 - More recently commonality in daily market liquidity
- **Main question:** Is the time-variation in FX market liquidity due to changes in funding liquidity of financial intermediaries?
 - Recent research on market and funding liquidity interaction

The Paper

- **Aim:** Model the time-variation in FX **market** liquidity
 - Previous studies on bid-ask spreads for individual currencies
 - More recently commonality in daily market liquidity
- **Main question:** Is the time-variation in FX market liquidity due to changes in funding liquidity of financial intermediaries?
 - Recent research on market and funding liquidity interaction
- Empirical approach follows Chordia et al. (2001) (Equities)

The Paper

- **Aim:** Model the time-variation in FX **market** liquidity
 - Previous studies on bid-ask spreads for individual currencies
 - More recently commonality in daily market liquidity
- **Main question:** Is the time-variation in FX market liquidity due to changes in funding liquidity of financial intermediaries?
 - Recent research on market and funding liquidity interaction
- Empirical approach follows Chordia et al. (2001) (Equities)
 - 13 years for 20 currencies against the USD

The Paper

- **Aim:** Model the time-variation in FX **market** liquidity
 - Previous studies on bid-ask spreads for individual currencies
 - More recently commonality in daily market liquidity
- **Main question:** Is the time-variation in FX market liquidity due to changes in funding liquidity of financial intermediaries?
 - Recent research on market and funding liquidity interaction
- Empirical approach follows Chordia et al. (2001) (Equities)
 - 13 years for 20 currencies against the USD
 - Periods of market decline and crises

The Paper

- **Aim:** Model the time-variation in FX **market** liquidity
 - Previous studies on bid-ask spreads for individual currencies
 - More recently commonality in daily market liquidity
- **Main question:** Is the time-variation in FX market liquidity due to changes in funding liquidity of financial intermediaries?
 - Recent research on market and funding liquidity interaction
- Empirical approach follows Chordia et al. (2001) (Equities)
 - 13 years for 20 currencies against the USD
 - Periods of market decline and crises
 - Robustness: Other market liquidity proxy; endogeneity; shocks

The Paper

- **Aim:** Model the time-variation in FX **market** liquidity
 - Previous studies on bid-ask spreads for individual currencies
 - More recently commonality in daily market liquidity
- **Main question:** Is the time-variation in FX market liquidity due to changes in funding liquidity of financial intermediaries?
 - Recent research on market and funding liquidity interaction
- Empirical approach follows Chordia et al. (2001) (Equities)
 - 13 years for 20 currencies against the USD
 - Periods of market decline and crises
 - Robustness: Other market liquidity proxy; endogeneity; shocks
- **Contribution:** Accounts for common trends and shocks in liquidity

Measures of (il)liquidity

3/9

- Daily market illiquidity measure as average bid-ask spread
- Daily funding liquidity proxied by the FCP index

Measures of (il)liquidity

- Daily market illiquidity measure as average bid-ask spread
- Daily funding liquidity proxied by the FCP index
- Market liquidity and funding liquidity connected (Tirole (2011))

Measures of (il)liquidity

3/9

- Daily market illiquidity measure as average bid-ask spread
- Daily funding liquidity proxied by the FCP index
- Market liquidity and funding liquidity connected (Tirole (2011))
- From FX microstructure, dealer's spreads reflect

Measures of (il)liquidity

3/9

- Daily market illiquidity measure as average bid-ask spread
- Daily funding liquidity proxied by the FCP index
- Market liquidity and funding liquidity connected (Tirole (2011))
- From FX microstructure, dealer's spreads reflect
 - Adverse selection costs

Measures of (il)liquidity

3/9

- Daily market illiquidity measure as average bid-ask spread
- Daily funding liquidity proxied by the FCP index
- Market liquidity and funding liquidity connected (Tirole (2011))
- From FX microstructure, dealer's spreads reflect
 - Adverse selection costs
 - Inventory costs

Measures of (il)liquidity

3/9

- Daily market illiquidity measure as average bid-ask spread
- Daily funding liquidity proxied by the FCP index
- Market liquidity and funding liquidity connected (Tirole (2011))
- From FX microstructure, dealer's spreads reflect
 - Adverse selection costs
 - **Inventory costs**

Measures of (il)liquidity

- Daily market illiquidity measure as average bid-ask spread
- Daily funding liquidity proxied by the FCP index
- Market liquidity and funding liquidity connected (Tirole (2011))
- From FX microstructure, dealer's spreads reflect
 - Adverse selection costs
 - **Inventory costs**
- Hsieh and Kleidon (1996): Volatility in spreads not consistent with adverse selection

Measures of (il)liquidity

- Daily market illiquidity measure as average bid-ask spread
- Daily funding liquidity proxied by the FCP index
- Market liquidity and funding liquidity connected (Tirole (2011))
- From FX microstructure, dealer's spreads reflect
 - Adverse selection costs
 - **Inventory costs**
- Hsieh and Kleidon (1996): Volatility in spreads not consistent with adverse selection
- Bessembinder (1994): Spreads widen with proxies for inventory-carrying costs

Baseline results

— Baseline regression

$$\begin{aligned} \Delta illiq_t = & \alpha + \beta \Delta FCP_t + \gamma_1 d_t^{MON} + \gamma_2 d_t^{TUE} + \gamma_3 d_t^{WED} \\ & + \gamma_4 d_t^{THUR} + \sum_{i=1}^4 \theta_i \Delta illiq_{t-i} + \varepsilon_t \end{aligned}$$

Baseline results

— Baseline regression

$$\begin{aligned} \Delta illiq_t = & \alpha + \beta \Delta FCP_t + \gamma_1 d_t^{MON} + \gamma_2 d_t^{TUE} + \gamma_3 d_t^{WED} \\ & + \gamma_4 d_t^{THUR} + \sum_{i=1}^4 \theta_i \Delta illiq_{t-i} + \varepsilon_t \end{aligned}$$

— Baseline findings

- Accounts for 35% of the variation

Baseline results

— Baseline regression

$$\begin{aligned} \Delta illiq_t = & \alpha + \beta \Delta FCP_t + \gamma_1 d_t^{MON} + \gamma_2 d_t^{TUE} + \gamma_3 d_t^{WED} \\ & + \gamma_4 d_t^{THUR} + \sum_{i=1}^4 \theta_i \Delta illiq_{t-i} + \varepsilon_t \end{aligned}$$

— Baseline findings

- Accounts for 35% of the variation
- β negatively signed

Baseline results

— Baseline regression

$$\begin{aligned} \Delta illiq_t = & \alpha + \beta \Delta FCP_t + \gamma_1 d_t^{MON} + \gamma_2 d_t^{TUE} + \gamma_3 d_t^{WED} \\ & + \gamma_4 d_t^{THUR} + \sum_{i=1}^4 \theta_i \Delta illiq_{t-i} + \varepsilon_t \end{aligned}$$

— Baseline findings

- Accounts for 35% of the variation
- β negatively signed
- Nice robust monotonically decreasing liquidity Monday to Friday

Baseline results

— Baseline regression

$$\Delta illiq_t = \alpha + \beta \Delta FCP_t + \gamma_1 d_t^{MON} + \gamma_2 d_t^{TUE} + \gamma_3 d_t^{WED} \\ + \gamma_4 d_t^{THUR} + \sum_{i=1}^4 \theta_i \Delta illiq_{t-i} + \varepsilon_t$$

— Baseline findings

- Accounts for 35% of the variation
- β negatively signed
- Nice robust monotonically decreasing liquidity Monday to Friday

— Further controls

- Changes in margin requirements. TED and Federal Funds rate

Baseline results

— Baseline regression

$$\Delta illiq_t = \alpha + \beta \Delta FCP_t + \gamma_1 d_t^{MON} + \gamma_2 d_t^{TUE} + \gamma_3 d_t^{WED} \\ + \gamma_4 d_t^{THUR} + \sum_{i=1}^4 \theta_i \Delta illiq_{t-i} + \varepsilon_t$$

— Baseline findings

- Accounts for 35% of the variation
- β negatively signed
- Nice robust monotonically decreasing liquidity Monday to Friday

— Further controls

- Changes in margin requirements. TED and Federal Funds rate
- Lagged market-wide return. Average daily USD return

Baseline results

— Baseline regression

$$\Delta illiq_t = \alpha + \beta \Delta FCP_t + \gamma_1 d_t^{MON} + \gamma_2 d_t^{TUE} + \gamma_3 d_t^{WED} \\ + \gamma_4 d_t^{THUR} + \sum_{i=1}^4 \theta_i \Delta illiq_{t-i} + \varepsilon_t$$

— Baseline findings

- Accounts for 35% of the variation
- β negatively signed
- Nice robust monotonically decreasing liquidity Monday to Friday

— Further controls

- Changes in margin requirements. TED and Federal Funds rate
- Lagged market-wide return. Average daily USD return
- Volatility (G7 VXY)

Comments I and II

5/9

- Equal weighted returns as a proxy for states
 - Overall dollar appreciation noisy signal of market condition

Comments I and II

- Equal weighted returns as a proxy for states
 - Overall dollar appreciation noisy signal of market condition
 - USD 'safe-haven', JPY even more so. Relative prices

Comments I and II

- Equal weighted returns as a proxy for states
 - Overall dollar appreciation noisy signal of market condition
 - USD 'safe-haven', JPY even more so. Relative prices
 - Clear-cut measure: Carry trade return index, or weigh/sign each individual return with FCU-USD interest rate differential.

Comments I and II

- Equal weighted returns as a proxy for states
 - Overall dollar appreciation noisy signal of market condition
 - USD 'safe-haven', JPY even more so. Relative prices
 - Clear-cut measure: Carry trade return index, or weigh/sign each individual return with FCU-USD interest rate differential.
- Volatility
 - NYSE specialists in Chordia et al. (2001) hold positions
 - FX dealers prefer a zero *daily* closing position (Lyons (1998); Lyons (2001); Osler (2008))

Comments I and II

- Equal weighted returns as a proxy for states
 - Overall dollar appreciation noisy signal of market condition
 - USD 'safe-haven', JPY even more so. Relative prices
 - Clear-cut measure: Carry trade return index, or weigh/sign each individual return with FCU-USD interest rate differential.
- Volatility
 - NYSE specialists in Chordia et al. (2001) hold positions
 - FX dealers prefer a zero *daily* closing position (Lyons (1998); Lyons (2001); Osler (2008))
 - Effect if inventory is zero? Causally?

Comments I and II

- Equal weighted returns as a proxy for states
 - Overall dollar appreciation noisy signal of market condition
 - USD 'safe-haven', JPY even more so. Relative prices
 - Clear-cut measure: Carry trade return index, or weigh/sign each individual return with FCU-USD interest rate differential.
- Volatility
 - NYSE specialists in Chordia et al. (2001) hold positions
 - FX dealers prefer a zero *daily* closing position (Lyons (1998); Lyons (2001); Osler (2008))
 - Effect if inventory is zero? Causally?
 - Chordia et al. (2001) use MA of realized volatility. Would this change your results?

Market decline

6/9

- Do overall price decline ('bad' states) impact market liquidity more than overall price increase ('good' states)?

Market decline

6/9

- Do overall price decline ('bad' states) impact market liquidity more than overall price increase ('good' states)?
- Two approaches:
 1. Split market returns. Find significant asymmetry. 'Bad' states decrease market liquidity

Market decline

6/9

- Do overall price decline ('bad' states) impact market liquidity more than overall price increase ('good' states)?
- Two approaches:
 1. Split market returns. Find significant asymmetry. 'Bad' states decrease market liquidity
 2. Interact negative market returns with positive changes in FCP. Find additional large negative effect of funding constraints on market liquidity during 'bad' states

Comments III and IV

7/9

1. 'Good' and 'bad' states

Comments III and IV

7/9

1. 'Good' and 'bad' states

- Equal-weighting implies that dollar depreciation ('bad' state) against AUD, CLP and JPY are given equal weight, and represent the same state

Comments III and IV

7/9

1. 'Good' and 'bad' states

- Equal-weighting implies that dollar depreciation ('bad' state) against AUD, CLP and JPY are given equal weight, and represent the same state
- Lustig et al. (2011): Cross-sectional variation in excess returns explained by a carry-factor

Comments III and IV

7/9

1. 'Good' and 'bad' states
 - Equal-weighting implies that dollar depreciation ('bad' state) against AUD, CLP and JPY are given equal weight, and represent the same state
 - Lustig et al. (2011): Cross-sectional variation in excess returns explained by a carry-factor
2. Interacting negative market returns with positive changes in FCP, is testing whether 'bad' states only matter when funding liquidity is declining

Comments III and IV

7/9

1. 'Good' and 'bad' states
 - Equal-weighting implies that dollar depreciation ('bad' state) against AUD, CLP and JPY are given equal weight, and represent the same state
 - Lustig et al. (2011): Cross-sectional variation in excess returns explained by a carry-factor
2. Interacting negative market returns with positive changes in FCP, is testing whether 'bad' states only matter when funding liquidity is declining
 - Testing for a possible additional effect of funding liquidity on market liquidity during 'bad' states might be more informative

Comments III and IV

7/9

1. 'Good' and 'bad' states
 - Equal-weighting implies that dollar depreciation ('bad' state) against AUD, CLP and JPY are given equal weight, and represent the same state
 - Lustig et al. (2011): Cross-sectional variation in excess returns explained by a carry-factor
 2. Interacting negative market returns with positive changes in FCP, is testing whether 'bad' states only matter when funding liquidity is declining
- Testing for a possible additional effect of funding liquidity on market liquidity during 'bad' states might be more informative
- Specifying instead $\kappa \cdot d_{t-1}^- \cdot \Delta FCP_t$, you could check if the effect of funding liquidity is *more* important during 'bad' states

Crises and Comment V

8/9

- Effect of crises on the relationship between funding liquidity and market liquidity, interacting changes in the FCP with the TED level

Crises and Comment V

8/9

- Effect of crises on the relationship between funding liquidity and market liquidity, interacting changes in the FCP with the TED level
 - Coefficient nearly halved compared to baseline

Crises and Comment V

8/9

- Effect of crises on the relationship between funding liquidity and market liquidity, interacting changes in the FCP with the TED level
 - Coefficient nearly halved compared to baseline
 - Require some sort of sub-sample, unless the proxy is straight-on

Crises and Comment V

8/9

- Effect of crises on the relationship between funding liquidity and market liquidity, interacting changes in the FCP with the TED level
 - Coefficient nearly halved compared to baseline
 - Require some sort of sub-sample, unless the proxy is straight-on
 - If you want to analyse additional effects during specific dates: time-dummies interacted with changes in FCP?

Crises and Comment V

8/9

- Effect of crises on the relationship between funding liquidity and market liquidity, interacting changes in the FCP with the TED level
 - Coefficient nearly halved compared to baseline
 - Require some sort of sub-sample, unless the proxy is straight-on
 - If you want to analyse additional effects during specific dates: time-dummies interacted with changes in FCP?
 - If you want to analyse if crises 'in general' increase the effect of funding liquidity on market liquidity: TED higher than on average? Volatility higher than on average?

Thank you