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Discussion: “The Microstructure of the TIPS Market”

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Comments

SECTION 1

Data

Tick Data from Inter-dealer Market

- March 4, 2005 to March 27, 2008
- Captures 42% of inter-dealer TIPS trading
- Extending to Q3 & Q4 2008 would prove invaluable

Announcement Effects

Auction results

- Surprising result (tail or coming rich) can set and change the tone for the market and be a turning point; also a major ‘price discovery’ day
- Asymmetrical risk
- Non-standard Bids: more important in recent auctions

CPI release

- For most investors, the starting point for pricing are nominal yields, not real yields, so breakevens important, especially for shorter-dated TIPS -- may change going forward
- Carry is defined for another month
- Nominal valuation of TIPS is via CPI

Employment

- An indicator of real growth, good indicator of long-term core CPI
- Volatile trading conditions, requires liquidity

Announcement Effects (cont'd)

Crude Oil Inventory Data, Etc.

- Oil: biggest driver of shorter-dated TIPS (core vs headline CPI)

Liquidity

On-the-runs vs off-the runs

- Trading activity:
  - 10y: $136m for on-the-run vs $22m individual off-the-run (16%)
  - 5y: $87 vs $27m (31%)
  - 20y: $30m vs $6m (20%)
  - Note: off-the-run 5y volumes similar to off-the-run 10y
- Implications for illiquidity discount
- Bid/ask spread **not** different
- Quoted depth **not** different
- Prevalence of quotes different

Suggestions

- **Extension of dataset** to include the very interesting Q4 2008 period and noting changes in illiquidity over time; of special interest would be the Apr 12 vs Jan or Jul 12s and Apr 13 vs Jan or Jul 13s where the liquidity differentials would be large (on-the-run 5y vs off-the-run 10y in the 2013 maturity and off-the-run 5y vs off-the-run 10y in the 2012 maturity); this ties in to some of the analysis I have made pricing the par floor options
- **The pre- and post-auction data** showing the sudden and sharp volume and frequency of trade decreases when TIPS go from being on-the-run to being off-the-run would indicate a possible similar drop in liquidity which would manifest itself in price/yield or breakeven changes; would be useful to look at the same time period and note any such changes -- my hunch is that the change is not as dramatic as the drop in volume/freq; it would be interesting to see how long it takes for the drop in liquidity to translate into an appropriate change in the illiquidity discount; for periods where the relative illiquidity discount between on-the-run and off-the-run TIPS was 30 bps, say, the price difference change may not be as obvious or as interesting; for the Q4 period or a similar period in the future, it would be more interesting … the mid-Jan issuance is still a less liquid period than your dataset and could provide interesting results
- **Prevalence:** define appropriate bid/ask spreads for each TIPS/maturity area such that any wider 2-way is taken out of consideration for prevalence (e.g. at an extreme 50 bp wide 2-way is as unhelpful as a 1-way market and for most stable market conditions, a 20bp wide 2-way is also unhelpful and may not indicate prevalence)

On-the-run vs. off-the-run TIPS Liquidity Differentials

SECTION 2

Extension of Study and Application to Q2-Q4 2008 Data

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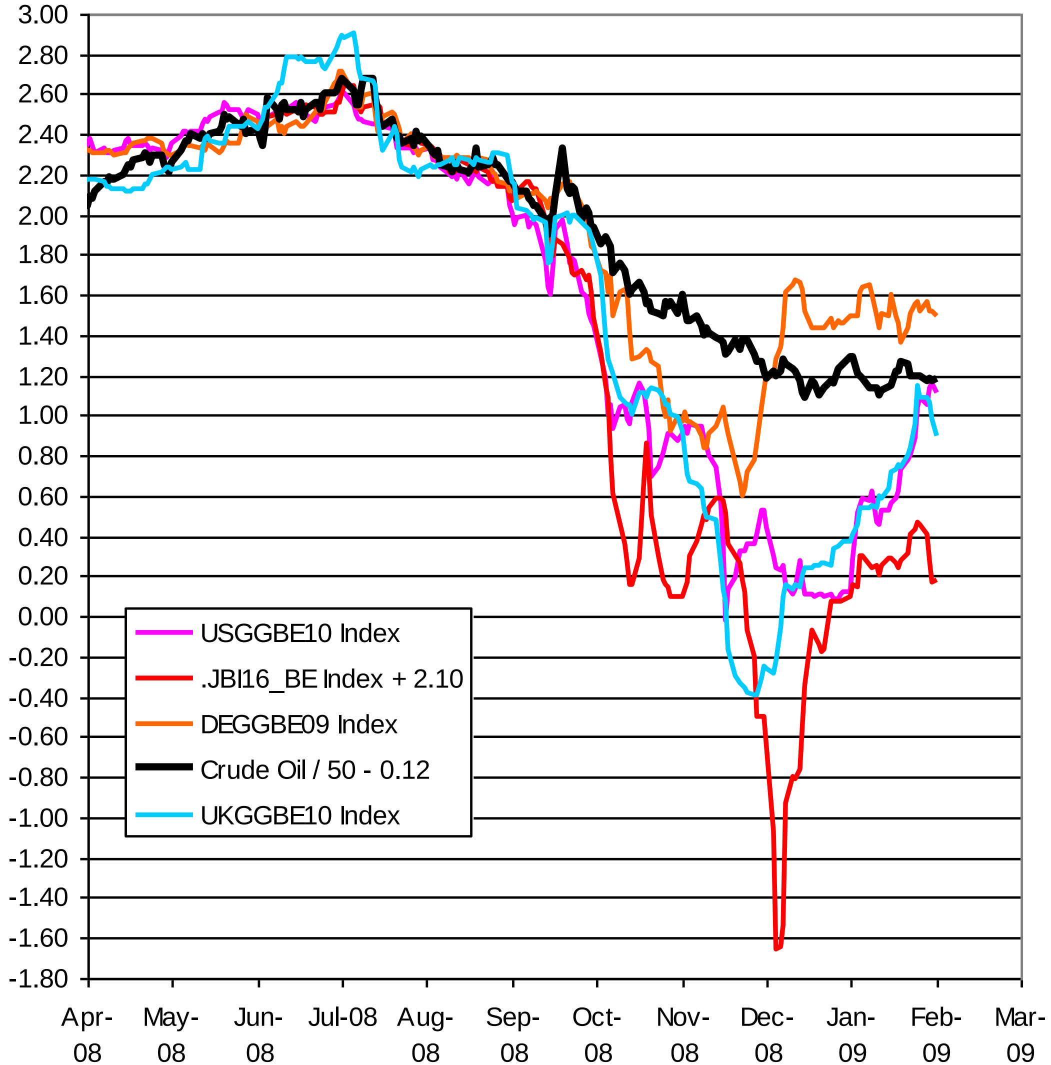
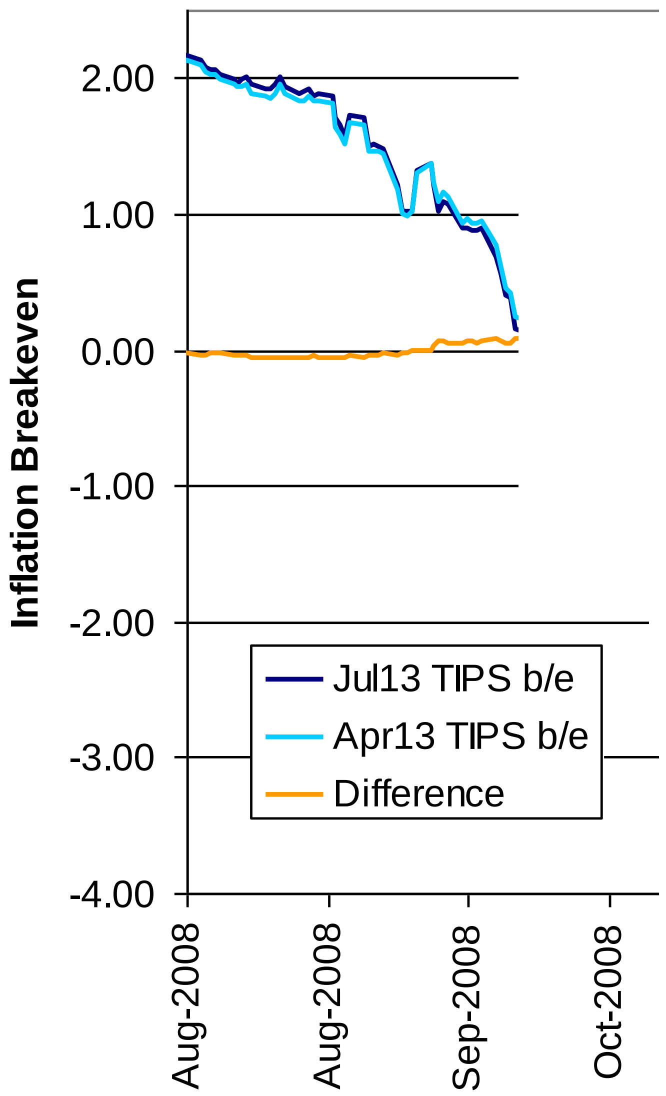
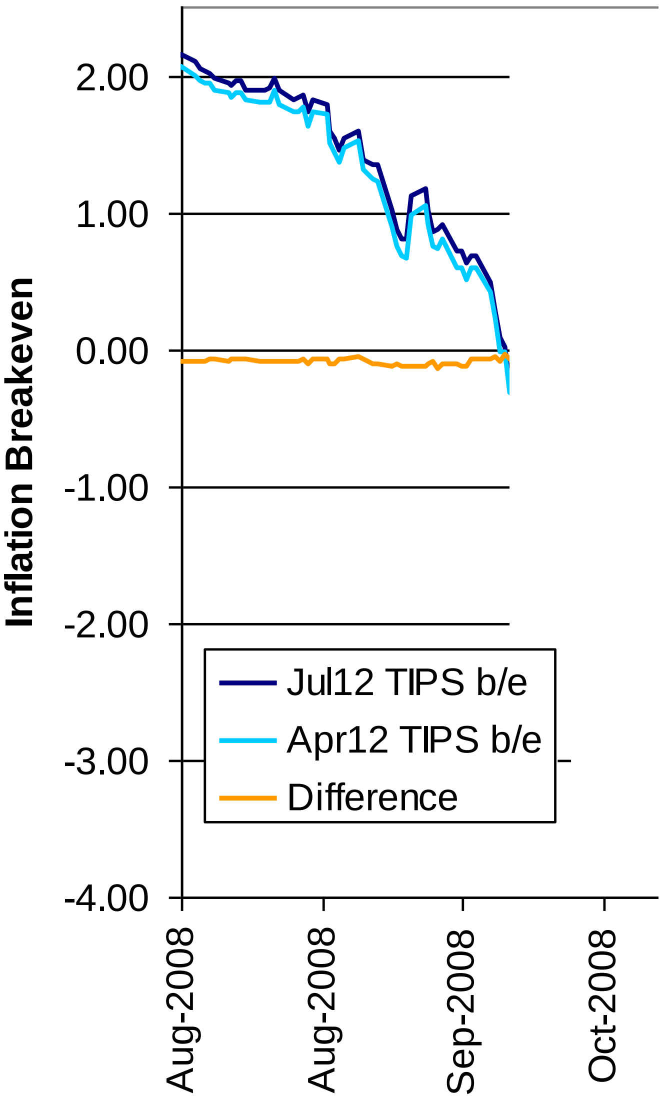
Global 10y Breakevens: 1 April 2008 through February 2009



Source: Bloomberg, UBS

TIPS Breakevens: Apr-13, Jul-13, Apr-12 & Jul-12





Source: Bloomberg, UBS

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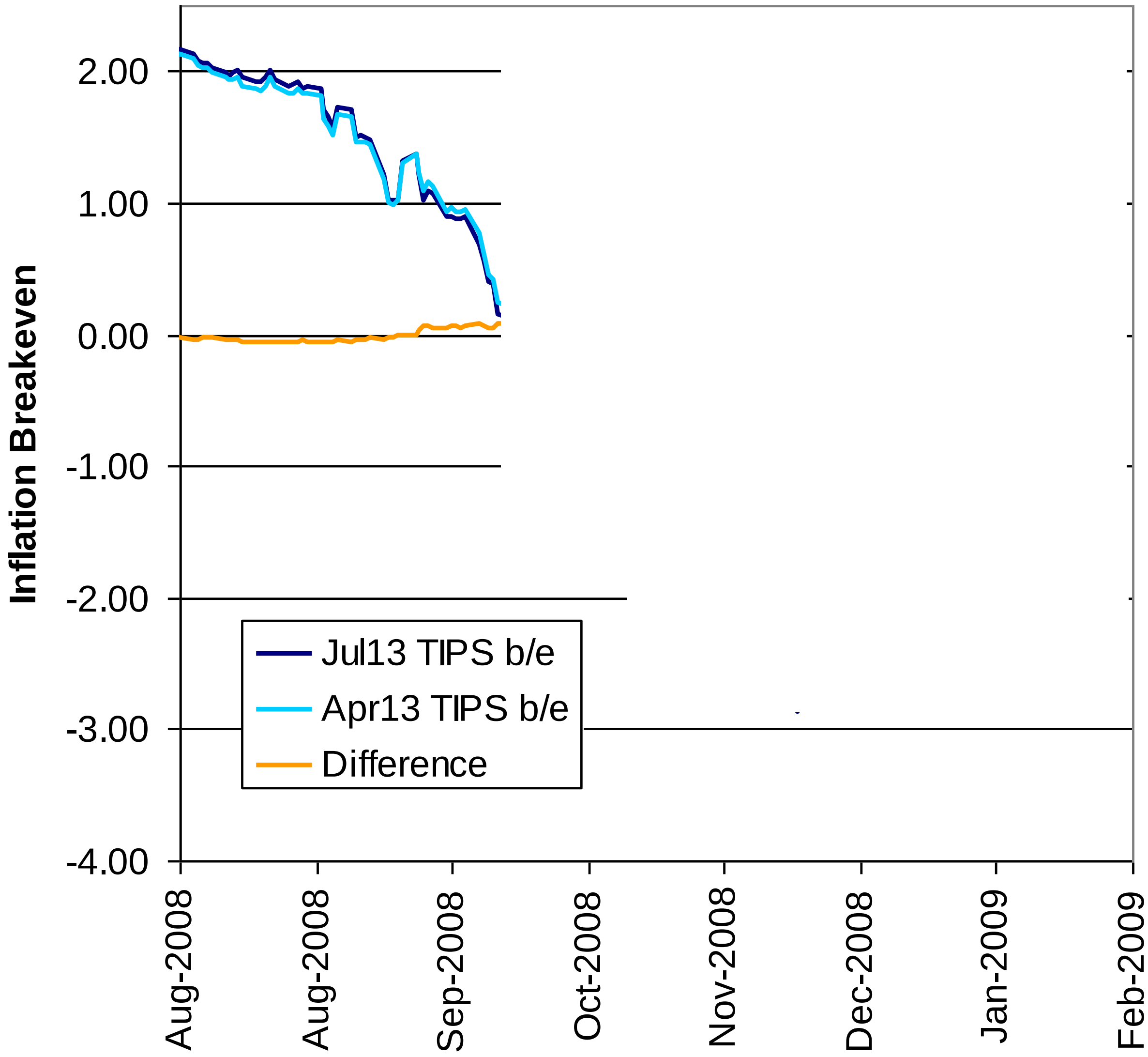
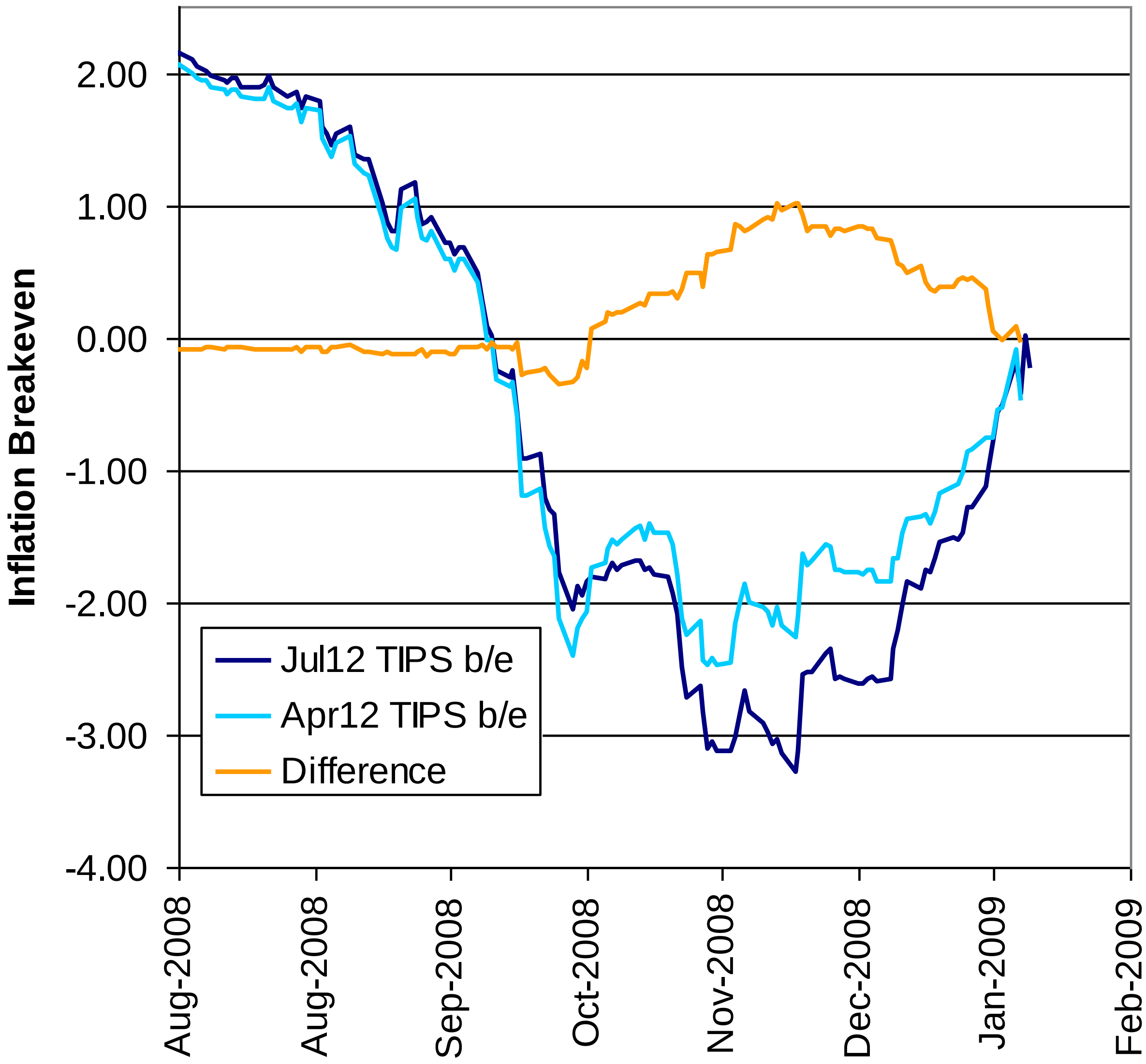
Apr-13 & Jul-13 TIPS Breakevens



Source: Bloomberg, UBS

Apr-12 & Jul-12 TIPS Breakevens



Source: Bloomberg, UBS

Lower Bound on the Illiquidity Term: L

$R^{obs} \coloneqq$ the observed real yield

$R^{*} \coloneqq$ the true real yield

$L \coloneqq$ the illiquidity discount expressed in bps per annum

$O \coloneqq$ the par floor option premium expressed in bps per annum

$$R^{obs} = R^{*} + L - O$$

$$R^{obs}_{Jul13} = R^{*}_{Jul13} + L_{Jul13} - O_{Jul13}$$

$$R^{obs}_{Apr13} = R^{*}_{Apr13} + L_{Apr13} - O_{Apr13}$$

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Lower Bound on the Illiquidity Term: L

$$R^{obs}_{Jul13} = R^{*}_{Jul13} + L_{Jul13} - O_{Jul13}$$
$$R^{obs}_{Apr13} = R^{*}_{Apr13} + L_{Apr13} - O_{Apr13}$$

Assume $O_{Jul13} = 0$, and $L_{Jul13} > 0$

$L_{Apr13} \coloneqq \alpha_{13} L_{Jul13}$, with $0 < \alpha_{13} < 1$

$R^{*}_{Jul13} = f\left(R^{*}_{Apr13}\right)$ using the slope of the real curve and seasonal assumptions

$$\boxed{\begin{aligned} R^{obs}_{Jul13} &= f\left(R^{*}_{Apr13}\right) + L_{Jul13} \\ R^{obs}_{Apr13} &= R^{*}_{Apr13} + \alpha_{13} L_{Jul13} - O_{Apr13} \end{aligned}}$$

$$O_{Apr13} = g\left(R^{*}, N, Vol\right)$$

4 unknowns : $R^{*}_{Apr13}, \alpha_{13}, L_{Jul13}, Vol$

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Similarly for 2012 Apr & Jul TIPS

$$R_{Jul12}^{obs} = f\left(R_{Apr12}^{*}\right) + L_{Jul12}$$

$$R_{Apr12}^{obs} = R_{Apr12}^{*} + \alpha_{12} L_{Jul12} - O_{Apr12}$$

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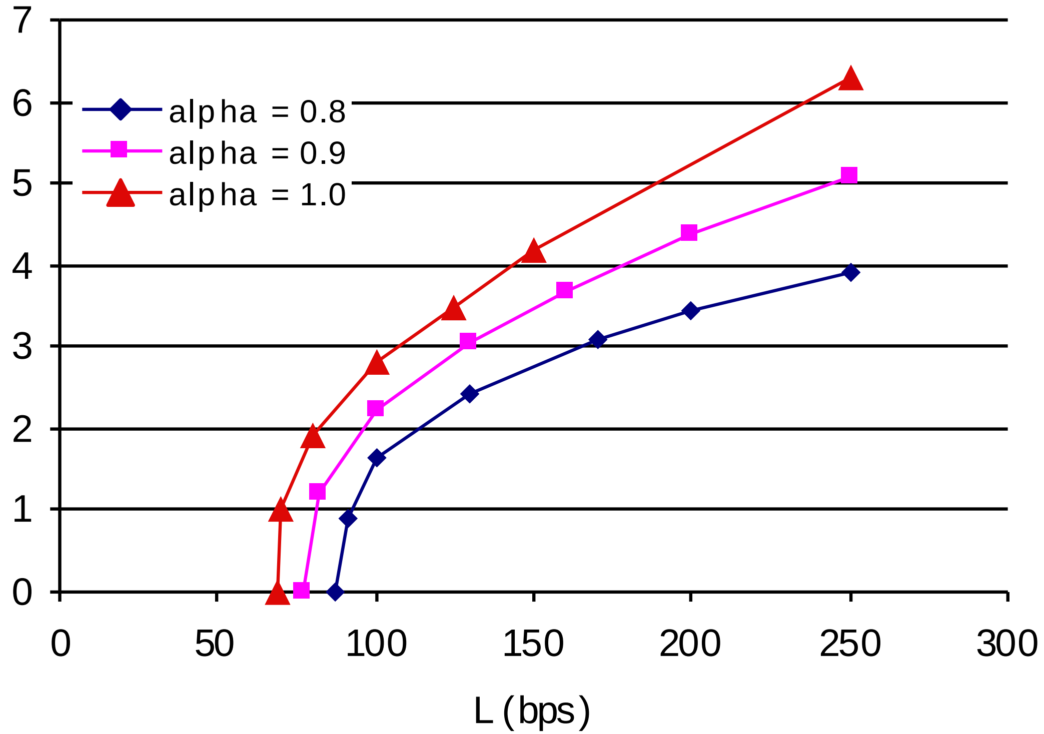
Establish a Lower Bound on the Illiquidity Term: L

$$R^{obs}_{Jul12} = f\left(R^{*}_{Apr12}\right) + L_{Jul12}$$

$$R^{obs}_{Apr12} = R^{*}_{Apr12} + \alpha_{12} L_{Jul12} - O_{Apr12}$$

5 January, 2009: using different values for alpha

Apr12 & Jul12 TIPS: 05-Jan-09



Source: UBS Inflation Trading Desk

1. Alpha = 1.0 gives a lower bound for a given Vol
2. Alpha = 1.0 & Vol = 0 gives the absolute lower bound for L
3. Solutions do not exist for alpha lower than 0.65
4. Alpha smaller than 0.8 requires Vols much lower than the 12-month average Vol of 5%
5. Most likely alpha between 0.9 and 1.0, so Apr12 TIPS Liquidity is likely to be close to Jul12 TIPS Liquidity

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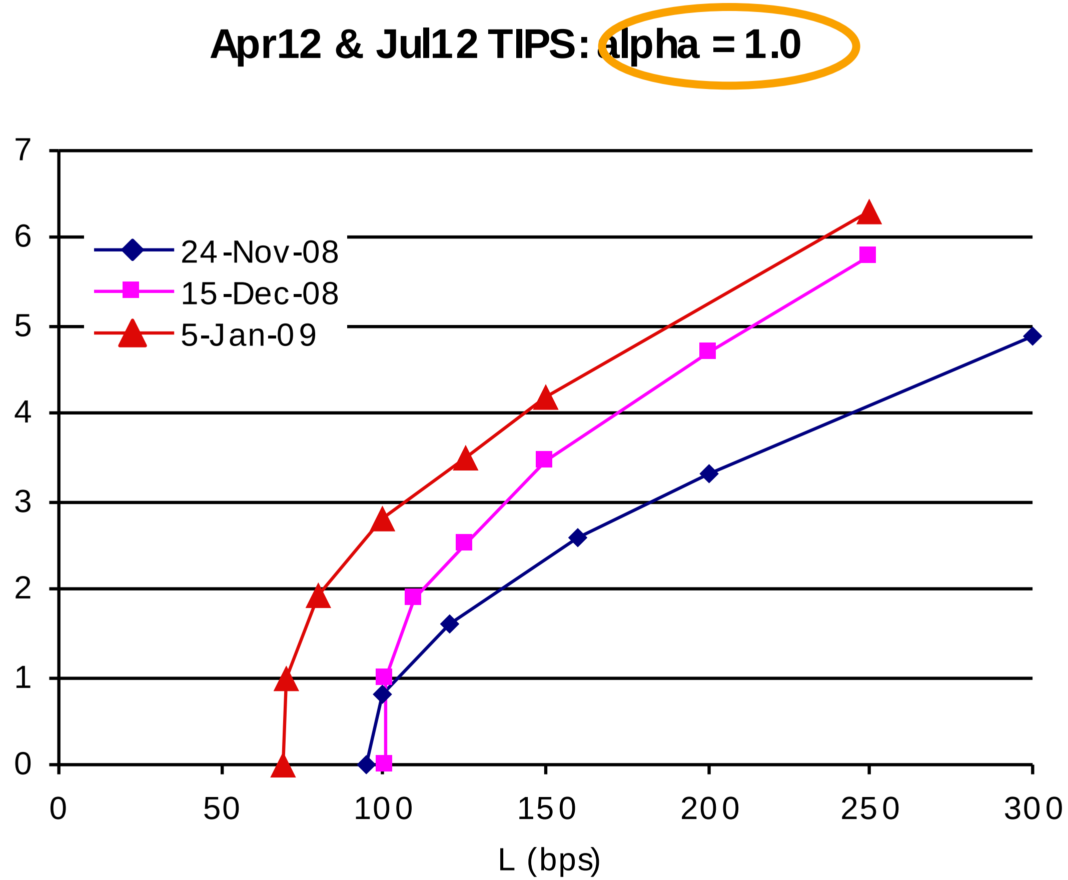
Liquidity coming back to the market: 24-Nov-08 to 05-Jan-09

Results for different dates using alpha = 1.0

$$R^{obs}_{Jul12} = f\left(R^{*}_{Apr12}\right) + L_{Jul12}$$

$$R^{obs}_{Apr12} = R^{*}_{Apr12} + \alpha_{12} L_{Jul12} - O_{Apr12}$$



Source: UBS Inflation Trading Desk

1. Use alpha = 1.0 to compare lower bounds for L (given Vol) for different dates

2. Not surprisingly, 24-Nov-08 gives the highest L

3. As liquidity comes back to the TIPS market by mid-Dec and early January, L drops lower and lower

4. Low point in breakevens (15-Dec-08) was **not** the high point in market illiquidity

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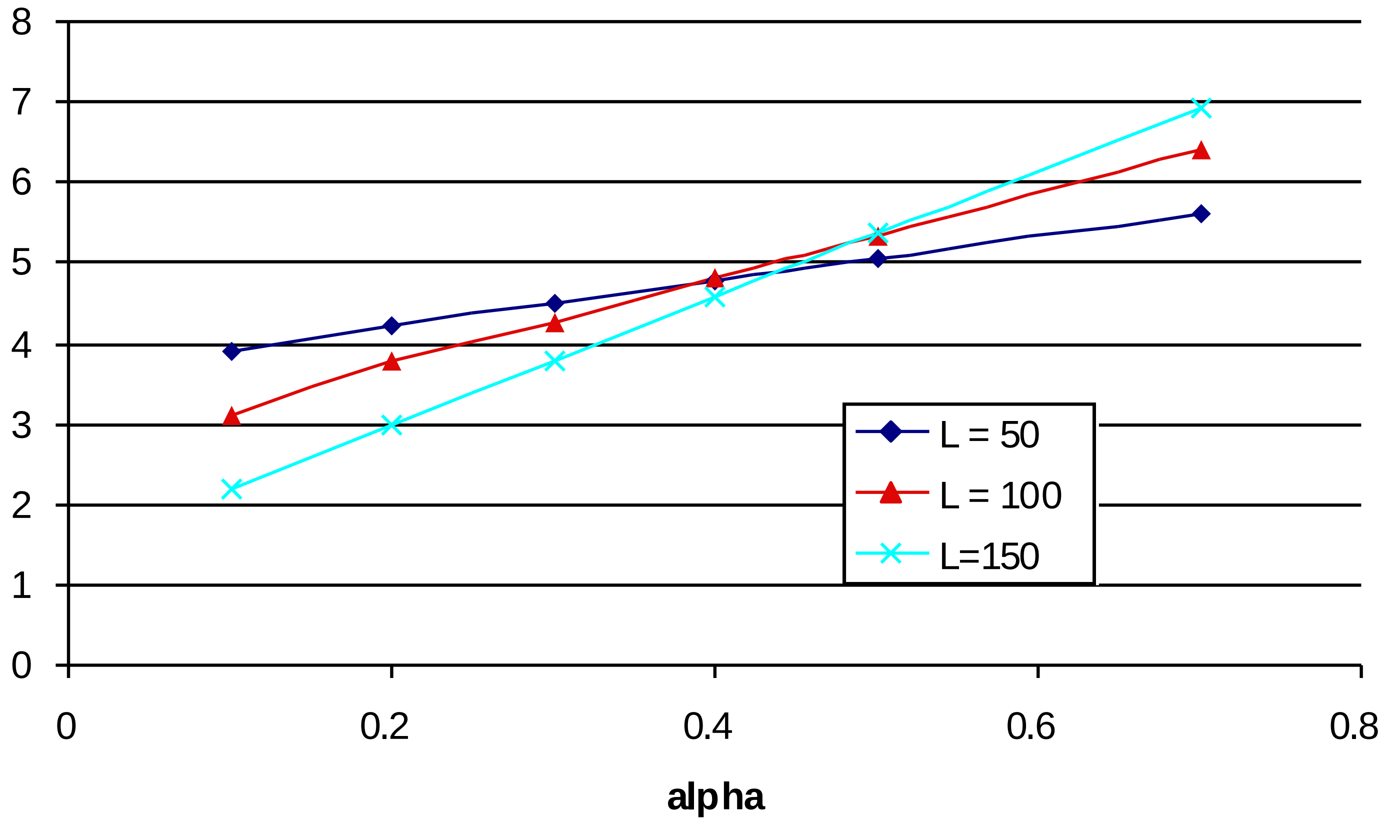
Apr13 & Jul13 TIPS: 05-Jan-09



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