Comments on "Walking After Midnight: Measurements and Pricing Implications of Market Liquidity on Corporate Bonds"

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December 19, 2010

The 12th Macroeconomics Conference
at Hitotsubashi University

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Main Points of the Paper

- Empirical Analysis of Market Liquidity in the Japanese Corporate Bond Market:
  - Focus on GAP as an indicator for market liquidity
  - Panel data analysis using low frequency data
- Empirical Evidence:
  - High explanatory power of lagged GAP
  - Persistency of spread
  - Higher impacts in lower credit ratings and worse market conditions

Empirical Framework

Credit factors　Liquidity factors

Micro　Macro　Macro　Micro

$$SP_{it} = \gamma SP_{i,t-1} + \beta_1 + \beta_2 f_{it} + \beta_3 F_t + \beta_4 L_t + \beta_5 l_{it} + \alpha_i + \varepsilon_{it}$$

JSDA data
Reported prices
+
Maturity adjustment

GAP
Highest – Lowest
+
One-day lag

Data:　Monthly series from July 2003 to April 2010

Tested Hypotheses

- H1: $\beta_5 > 0$
- H2: $\beta_5 \uparrow \leftarrow$ Credit ratings / Mkt conditions $\downarrow$
- H3: $\gamma<1$ + $\gamma \approx 1$
- H4: $\gamma \uparrow \leftarrow$ Credit ratings / Mkt conditions $\downarrow$

Results for Static Model

	(2) Model 1		(3) Model 2		(4) Model 3 Pooling		(4) Model 3 FE		(4) Model 3 RE		(4) Model 3 MLE	
3-Yr SPREAD	Coef.	Std.	Coef.	Std.	Coef.	Std.	Coef.	Std.	Coef.	Std.	Coef.	Std.
T_JGBGAP	1.4094	0.2414 ***	1.4493	0.2390 ***	0.9239	0.0861 ***	0.9837	0.1670 ***	0.9686	0.1687 ***	1.1903	0.0365 ***
JGBSLOPE (10Y-2Y)	0.0530	0.0542	0.0415	0.0518	-0.0325	0.0212	-0.0223	0.0473	-0.0204	0.0446	-0.1311	0.0217 ***
JGB10Y	0.0167	0.0363	0.0297	0.0294	0.0962	0.0196 ***	0.0877	0.0205 ***	0.0876	0.0202 ***	0.3363	0.0240 ***
NKYGROWTH	0.6515	0.1106 ***	0.5901	0.1102 ***	0.4698	0.0944 ***	0.4754	0.0941 ***	0.4737	0.0942 ***	0.4247	0.0733 ***
e_HV			0.0039	0.0010 ***	0.0021	0.0005 ***	0.0020	0.0007 ***	0.0020	0.0007 ***	0.0025	0.0004 ***
RATE_RI			0.0926	0.0248 ***	0.0542	0.0029 ***	0.0763	0.0327 **	0.0628	0.0130 ***	0.0720	0.0057 ***
GAP3_1DLAG					1.7743	0.2907 ***	1.5833	0.2066 ***	1.6064	0.2073 ***	0.5638	0.0145 ***
GAP3_1DLAG_Adj												
3-Yr SPREAD (Lagged)												
_cons	0.0484	0.0623	-0.4874	0.1729 ***	-0.3611	0.0449 ***	-0.4758	0.1963 **	-0.4009	0.1054 ***	-0.7368	0.0614 ***
# Obs	4173		4173		4172		4172		4172		4172	
# Group	52		52		52		52		52		52	
R-sq:												
within	0.2673		0.3069				0.5273		0.5269			
between	0.0320		0.6124				0.7518		0.7719			
overall	0.1793		0.4070		0.6151		0.6029		0.6120			
sigma_alpha							0.0288		0.0000		0.1367	
sigma_e							0.0905		0.0905		0.2592	
rho: AR(1) on e											0.2178	

Note: ***:1%, **:5%, *:10%

Results for Dynamic Model

	(5) Dynamic Model 4 AR1		(5) Dynamic Model 5 Pooling		(5) Dynamic Model 5 FE		(5) Dynamic Model 5 RE		(5) Dynamic Model 5 AB GMM		(5) Dynamic Model 5 AH MLE	
3-Yr SPREAD	Coef.	Std.	Coef.	Std.	Coef.	Std.	Coef.	Std.	Coef.	Std.	Coef.	Std.
T_JGBGAP	0.4664	0.0409 ***	0.0496	0.0193 ***	0.0634	0.0150 ***	0.0496	0.0146 ***	0.0537	0.0253 **	0.0588	0.0148 ***
JGBSLOPE (10Y-2Y)	-0.1087	0.0273 ***	-0.0633	0.0055 ***	-0.0577	0.0078 ***	-0.0633	0.0078 ***	-0.0530	0.0049 ***	-0.0618	0.0077 ***
JGB10Y	0.0319	0.0218	0.0036	0.0089	0.0043	0.0087	0.0036	0.0088	-0.0016	0.0066	0.0043	0.0087
NKYGROWTH	0.1255	0.0211 ***	-0.0206	0.0247	-0.0136	0.0258	-0.0206	0.0259	-0.0126	0.0212	-0.0171	0.0258
e_HV	0.0002	0.0001	0.0003	0.0001 *	0.0004	0.0001 ***	0.0003	0.0001 **	0.0004	0.0002 *	0.0003	0.0001 ***
RATE_RI	0.0617	0.0078 ***	0.0030	0.0008 ***	-0.0052	0.0028 *	0.0030	0.0007 ***	-0.0126	0.0119	0.0031	0.0009 ***
GAP3_1DLAG	0.2900	0.0163 ***	0.3905	0.1306 ***	0.4096	0.0149 ***	0.3905	0.0146 ***	0.4310	0.1341 ***	0.3989	0.0149 ***
GAP3_1DLAG_Adj												
3-Yr SPREAD (Lagged)			0.8866	0.0249 ***	0.8682	0.0053 ***	0.8866	0.0048 ***	0.8625	0.0367 ***	0.8782	0.0054 ***
_cons	0.0105	0.0540	0.0449	0.0186 **	0.0860	0.0245 ***	0.0449	0.0196 **	0.1337	0.0636 **	0.0424	0.0198 **
# Obs	4172		4116		4116		4116		4059		4116	
# Group	52				52		52		52		52	
R-sq:												
within	0.4261				0.9384		0.9381					
between	0.6335				0.9972		0.9980					
overall	0.4435				0.9565		0.9584					
sigma_alpha			0.0288		0.0000						0.0101	
sigma_e			0.0905		0.0905						0.0906	
rho: AR(1) on e											0.0122	

Note: ***:1%,**:5%, *:10%

Overall Comments

- Careful Empirical Work

- But, Low Frequency Implications of GAP?
  - Market liquidity at a low frequency level
  - Appropriate empirical framework to examine basic questions?
  - A way of understanding for market liquidity?
  - Confusing title of the paper

Title of the Paper?

- The Previous Version:
  - "Measuring the Effect of Liquidity on Corporate Bond Spreads: Evidence from Japanese Corporate Bond Data"
- What Does "Walking after Midnight" Mean?
  - Citation from a book, article, music song?
  - Something happens in markets after midnight?
  - But markets do not generally open in midnight

Title of the Paper? (Cont'd)

- In This Paper:
  - No explanation in abstract and introduction
  - First mentioned in p.18: Gradual adjustment in bond spreads → "somewhat resembling 'walking after midnight'."
  - More explanation given in p.24: "actually looks like 'walking after midnight' (i.e., not walk away from the previous step when really dark)"
    → Walking in the dark with measured steps?
  - But, data used in empirical analysis: Monthly!

Market Liquidity

- Understanding based on Market Micro-structure Literature:
  - Market depth: accommodate trading with least price impacts
  - Price tightness: narrow bid-ask spread
  - Market resiliency: quick restoration of equilibrium prices

High-frequency Nature?

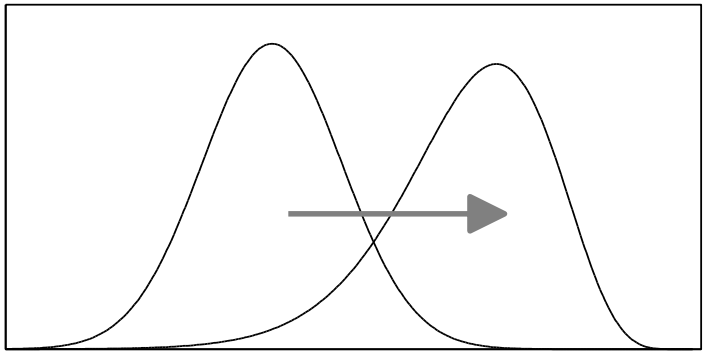
Low Frequency Implications

- Why Persistent Differences in Reported Prices b/w Market Makers?
  - Heterogeneous belief of market makers?
  - Low information efficiency?
- GAP as a Market Liquidity Indicator?:
  - Outstanding amounts of bonds
  - Bond holders
  - Comparing with equity markets

Information Contents

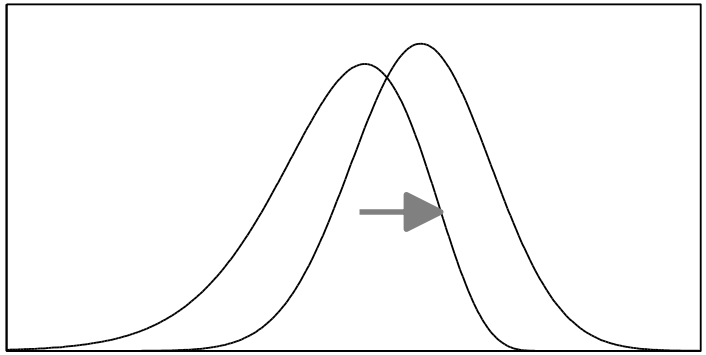
- Heterogeneous Belief:
  - Diversity of belief → High-low spread
  - Skewness of belief → Mean-median ratio?

(early stage of rise in market level)



Stdv: rise
Skew: increasingly negative
Ex-kurt: rise

(recovering stability in market level)



Stdv: fall
Skew: lesser negative
Ex-kurt: fall

High-frequency Nature?

Detailed Comments and Suggestions

- Make Use of High Frequency Data
- Sample Split & Market Conditions
- Estimation Procedures
  - Overlapping observations
  - Multicolinearity

Make Use of High Frequency Data

- Estimation Using Daily Data
  - Focus on high-frequency nature of market liquidity
- Estimate Similar Specification:
  - Rolling regression with shorter subsamples
  - Check time-variation in estimates
- Event Studies:
  - Eg. earnings announcement
  - Making use of daily data
  - Comparing with equity market

Detailed Comments and Suggestions

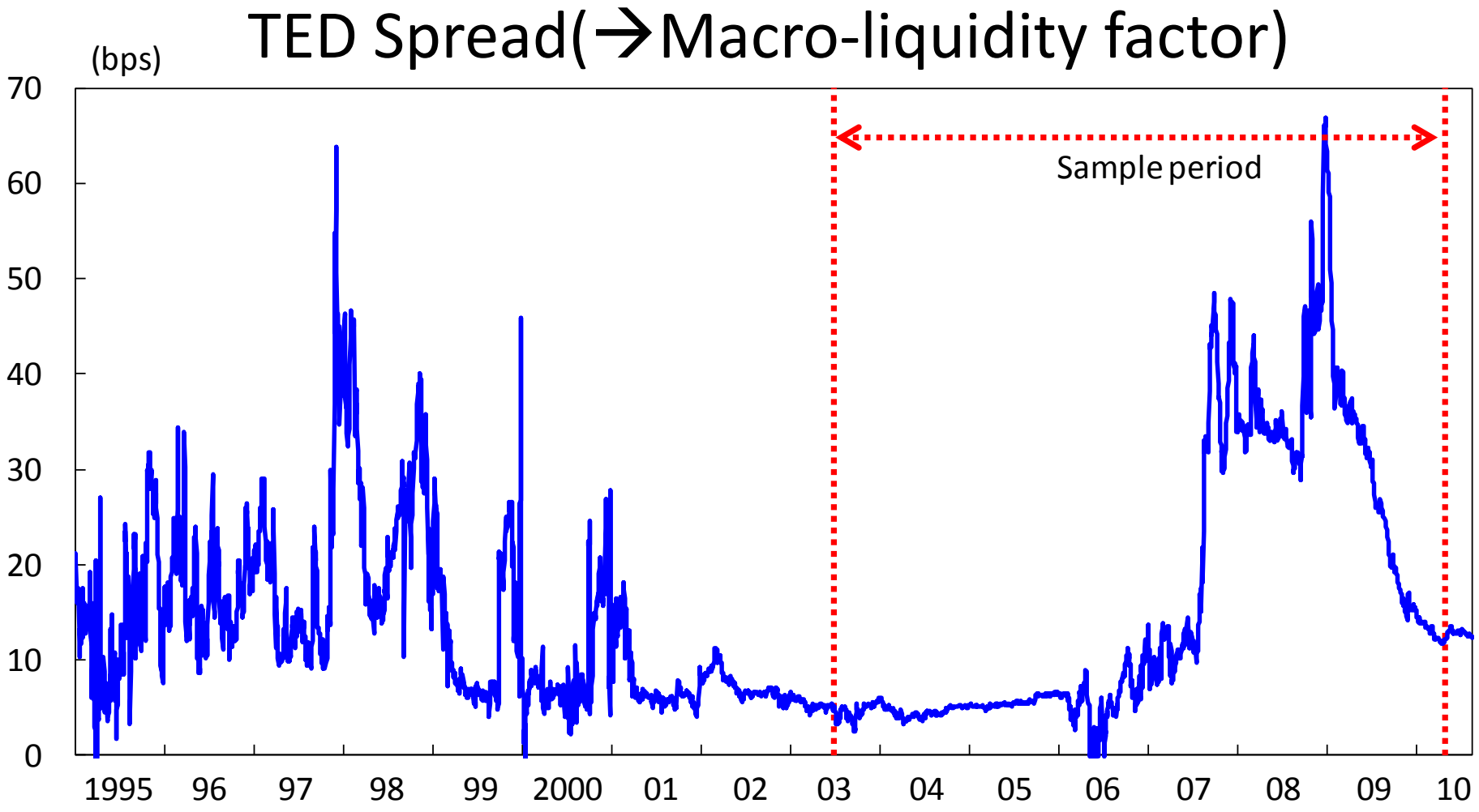
- Make Use of High Frequency Data
- Sample Split & Market Conditions
- Estimation Procedures
  - Overlapping observations
  - Multicolinearity

Sample Period

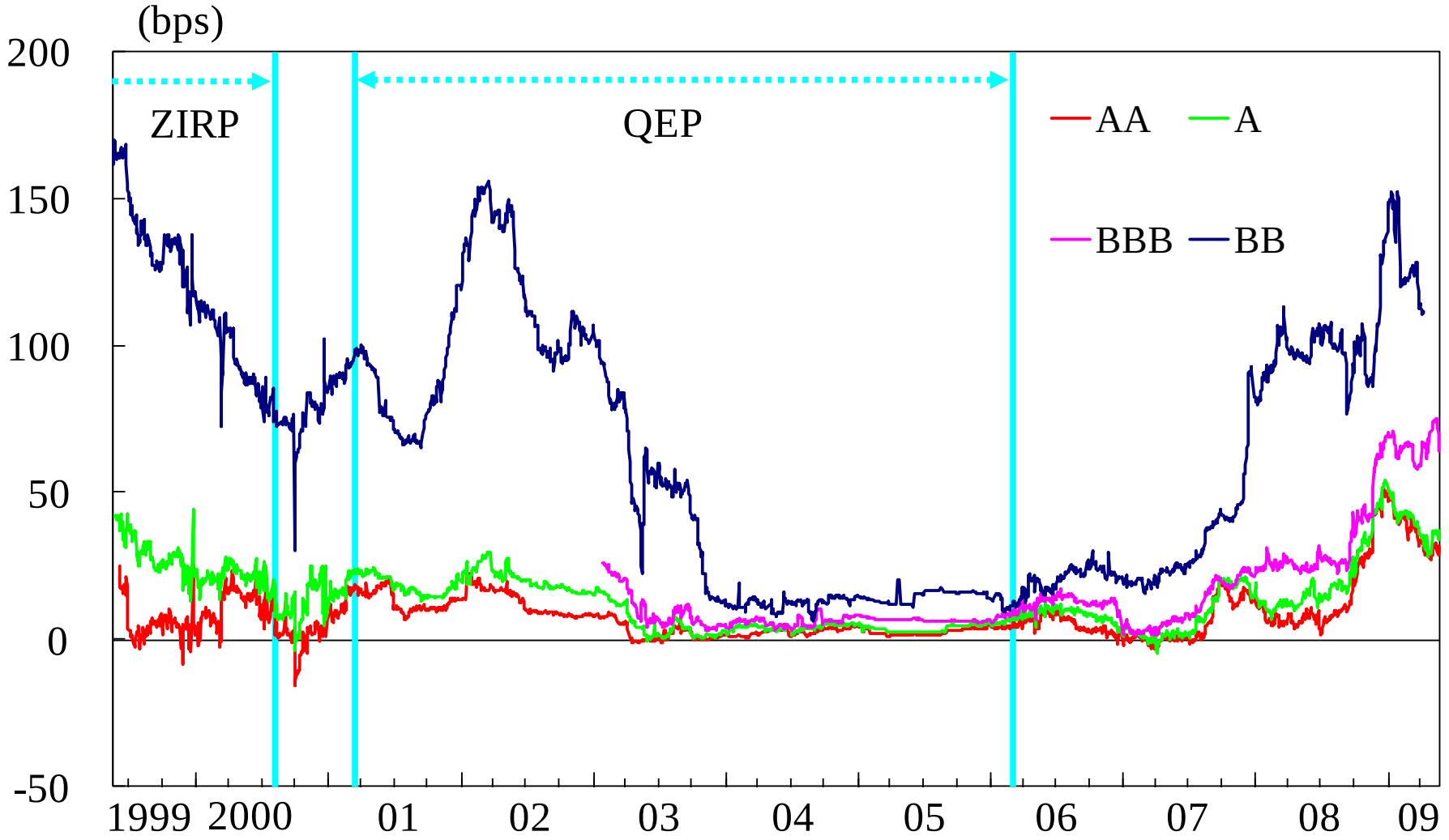
- From July 2003 to April 2010

- Events:
  - BOJ's QEP: until March 2006
  - Global financial crisis after the failure of Lehman Brothers: September 2008

Interbank Money Market Conditions



Credit Spreads (short-term)



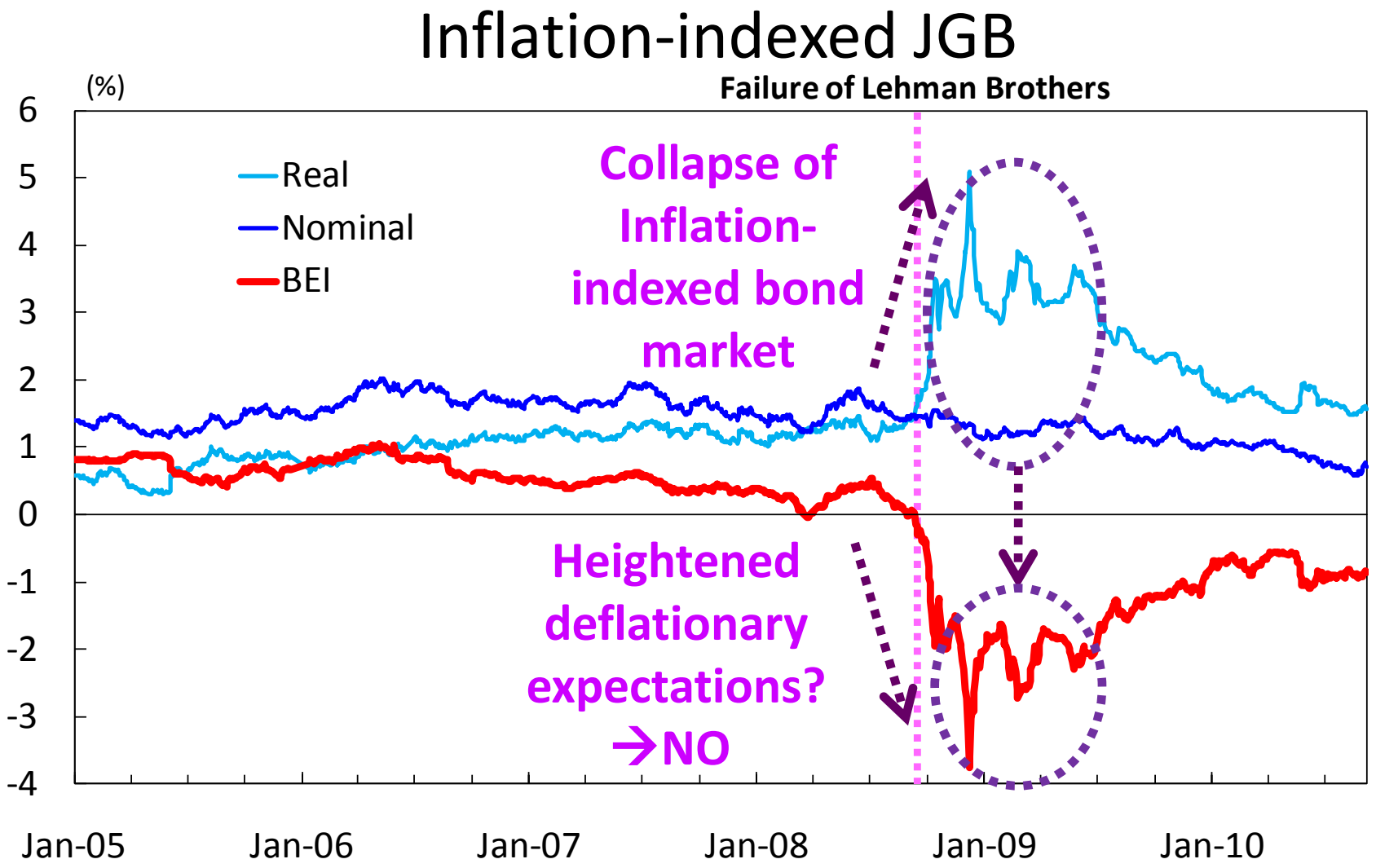
Liquidity Constraints for FIs under Crisis

- Market Makers in Normal Times:
  - Liquidity provider to adjust demand-supply imbalances
- In Crisis Times:
  - Limits of arbitrage due to funding-liquidity constraints at FIs
  - Market segmentation & Distorted prices

Linear Specification?

GAP: Just a Micro-liquidity Factor?

Collapsed Market under Crisis



Detailed Comments and Suggestions

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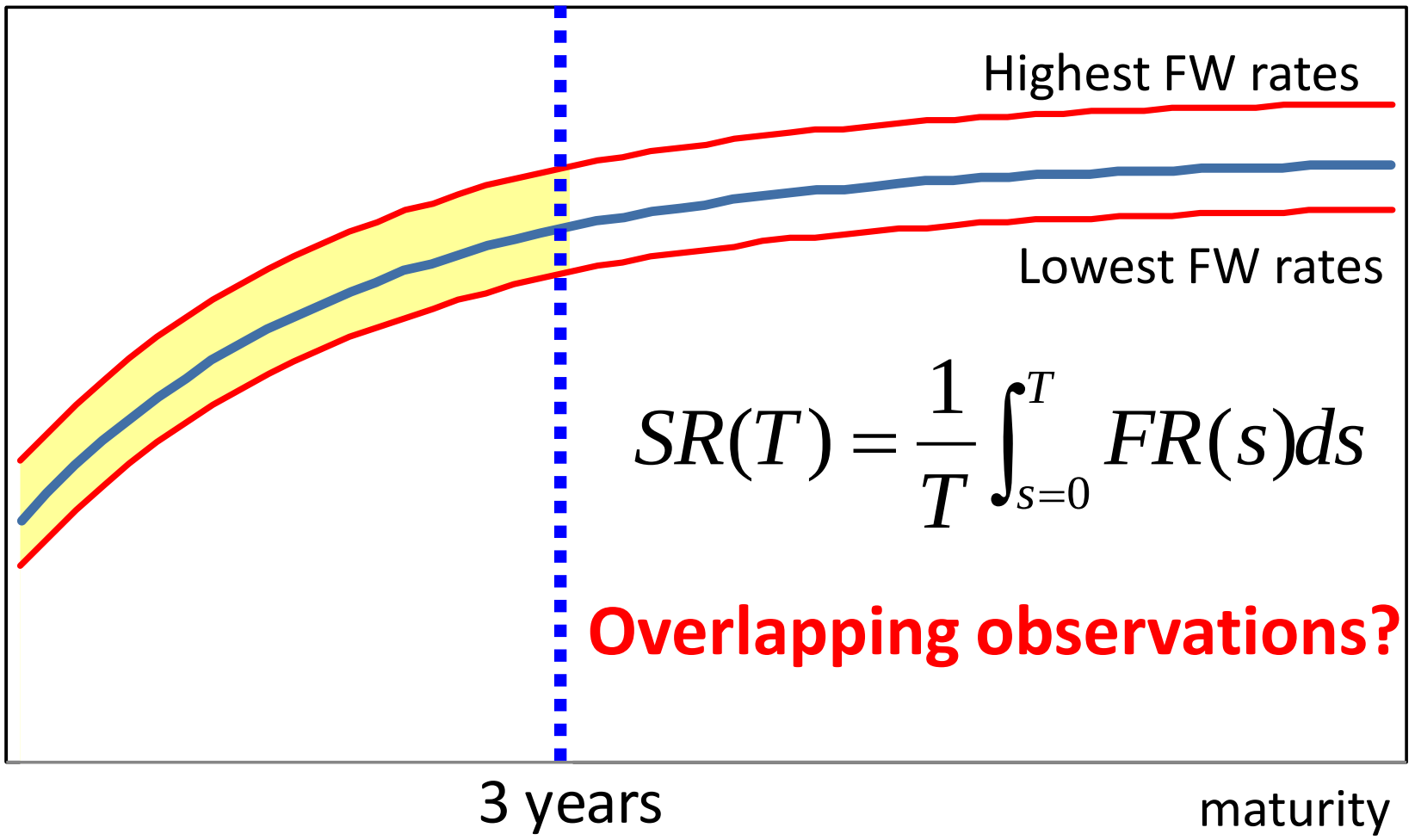
Spot Rate vs. Forward Rate



Correlation Matrix

	3-Yr SPREAD	3-Yr SPREAD (Lagged)	T_JGBGAP	JGBSLOPE (10Y-2Y)	JGB10Y	NKY GROWTH	eHV	RATE_RI	GAP3_ 1DLAG	GAP3_ 1DLAG_ Adj
3-Yr SPREAD	1.00									
3-Yr SPREAD(Lagged)	0.97	1.00								
T_JGBGAP	0.42	0.40	1.00							
JGBSLOPE (10Y-2Y)	-0.15	-0.12	-0.44	1.00						
JGB10Y	-0.17	-0.16	-0.42	-0.07	1.00					
NKYGROWTH	0.00	0.02	-0.19	0.28	-0.01	1.00				
eHV	0.32	0.31	0.09	-0.07	-0.03	0.04	1.00			
RATE_RI	0.44	0.45	-0.05	0.03	0.01	0.01	0.33	1.00		
GAP3_1DLAG	0.68	0.63	0.31	-0.06	-0.19	0.00	0.26	0.25	1.00	
GAP3_1DLAG_Adj	0.59	0.57	0.22	0.16	-0.38	0.07	0.21	0.25	0.89	1.00

Summary

- Empirical Analysis of Market Liquidity in the Japanese Corporate Bond Market
- Careful Empirical Analysis
- How to Strike a Balance b/w Motivations & Empirical Work
  - Reconsider low frequency implications of GAP
  - Make use of high frequency data