

# Measuring CDS Liquidity

In London: Mirela Predescu, Rutang Thanawalla


In NY: Greg Gupton, Ahmet Kocagil, Wei Liu, Alexander Reyngold

Quantitative Analytics & CDS Pricing Service, **Fitch** Solutions

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## What type of liquidity?



- > Generic usage: Liquidity is the ability to convert an asset into cash *easily*
  - > Low cost, quick trades
- > Aggregate liquidity measures (across financial markets)
  - Asset classes: Currencies, bonds/interest rates, equities
  - Regions: US, Europe, Japan, etc.
  - Some metrics for systemic illiquidity floated by central banks, int'l organisations
- > Specific CDS contract's liquidity
  - "CDS on Alcoa is more liquid than the CDS on American Express today"
    - > Operational measure
    - > "Reduced-form" approach
      - Uses available CDS spread information across various contributors to measure changing trends (treats spread and bid-offer quotes as *exogenous*) 
  - Key challenges
    - > Must be able to analyse liquidity without real-time (traded) CDS volumes or notional outstanding information

## Targets



- > Single, unified model that measures CDS liquidity
  - > At reference entity level and at various composite levels
    - E.g. “CDS on Ford is more liquid than CDS on Alcoa (today)”.
    - E.g. “CDS on financials are less liquid in 2007 than CDS on Technology”
    - E.g. “Is the distribution of liquidity skewed?”
  - > Works for global portfolios
    - E.g. if Deutsche Telekom & Ford in same portfolio, their liquidity metrics should be comparable
  - > Makes liquidity comparable across credit quality
    - Data on both High Yield and Inv. Grade names pooled together
    - Aim to exclude default risk from liquidity scores
  - > Is dynamic
    - Should be able to compare liquidity scores of individual reference entities (and market liquidity indicators) *over time* (e.g. less market liquidity in Dec 2006 vs Dec 2007 in Asia)
    - Can be regularly updated (e.g. daily) using current market indicators of the CDS market

## Related Papers

- > Tang and Yan (2007)
  - Use five liquidity measures ('Bid-Ask Spread (BAS)', 'Volatility to Volume (V2V)', 'Number of Contracts Outstanding (NOC)', 'Trade To Quote Ratio (T2Q)', 'Volume') to investigate liquidity premia in CDS spreads
  - Mixed Results: Liquidity premia for the protection seller (BAS, V2V) or protection buyer (NOC, Volume)
- > Bongaerts, de Jong and Driessen (2007)
  - Use the liquidity-adjusted CAPM (Acharya and Pedersen (2005)) to estimate expected liquidity and liquidity risk premia in the CDS market.
  - Use the Bid-Ask Spread as a measure of liquidity
  - Liquidity premia for the protection seller
- > Chen, Cheng and Wu (2005)
  - Use a reduced-form model to model interest rate risk, credit risk and liquidity risk in a unified framework
  - Use the percentage of days with zero changes in the mid-quote as a measure of liquidity
  - Liquidity premia for the protection buyer

## Main Contributions

- > Utilize quote information up to individual contributor level;
- > Aggregate individual measures of liquidity based on views of major participants;
- > Liquidity is estimated independent of credit risk;
- > Ordinal measure of liquidity.
  - > Model-generated scores provide an ordinal (or ranking-based) measure
    - Not a “liquidity rating” or a *long-term view* of that name’s *funding liquidity*
    - Model score not a liquidity premium (e.g. 10 bps) but closely related

## Model Specification

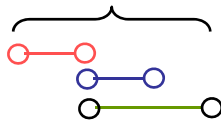


- > A logistic regression-based model that employs a handful of intuitive predictors of “liquidity”

Composite Liquidity Score =  $f$  ( inactivity & staleness of quotes,  
dispersion in midquotes across contributors,  
scaled bid-ask spread)



IoN: Inactivity on a Name

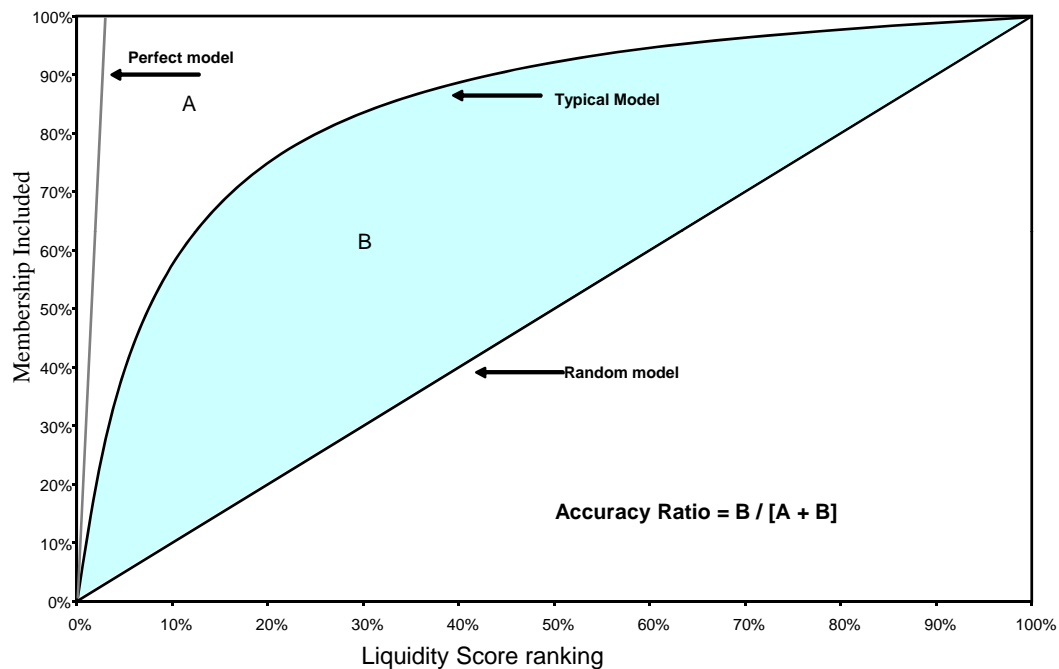


measure of *dispersion* across contributors



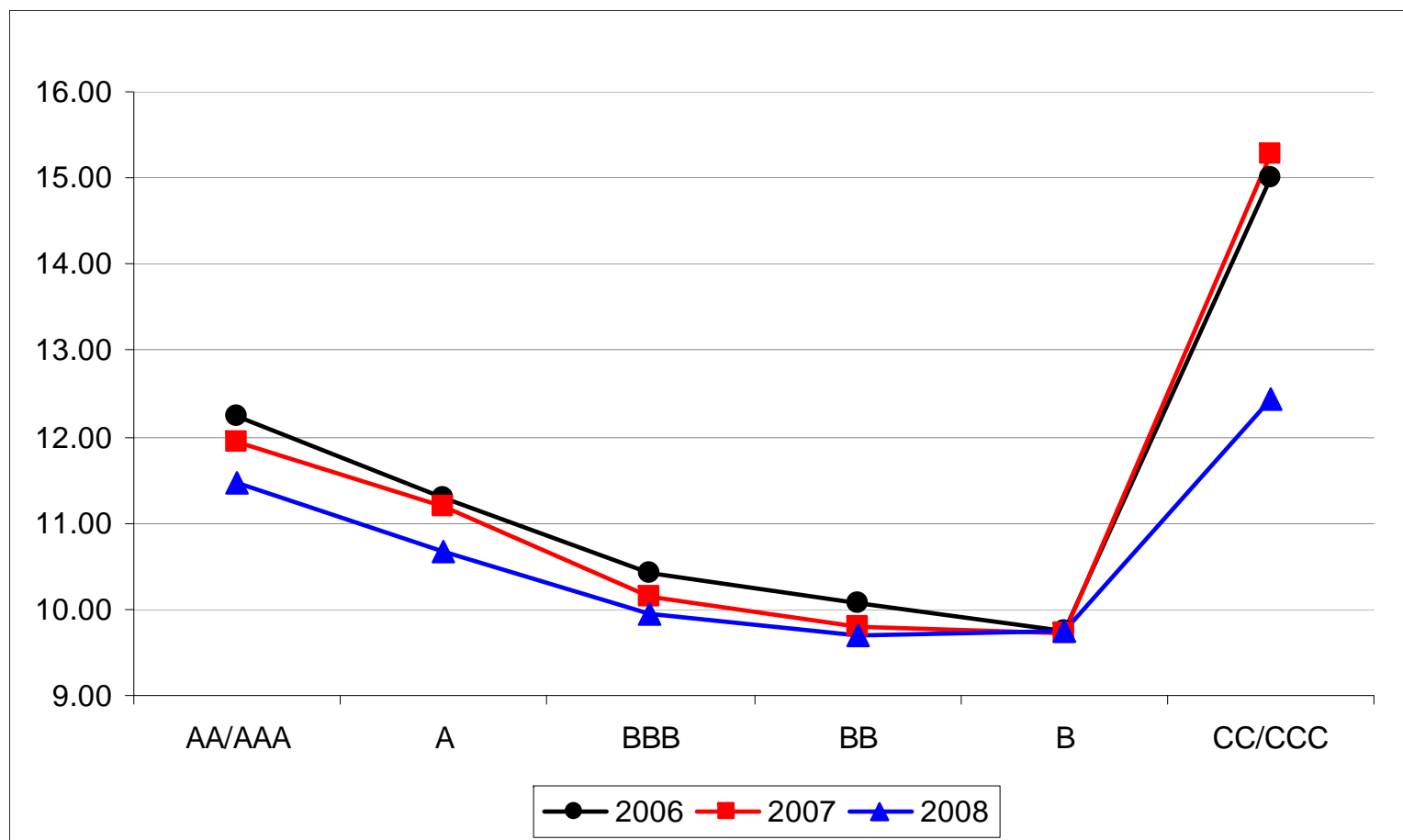
Bid-ask spread

## Accuracy Ratio

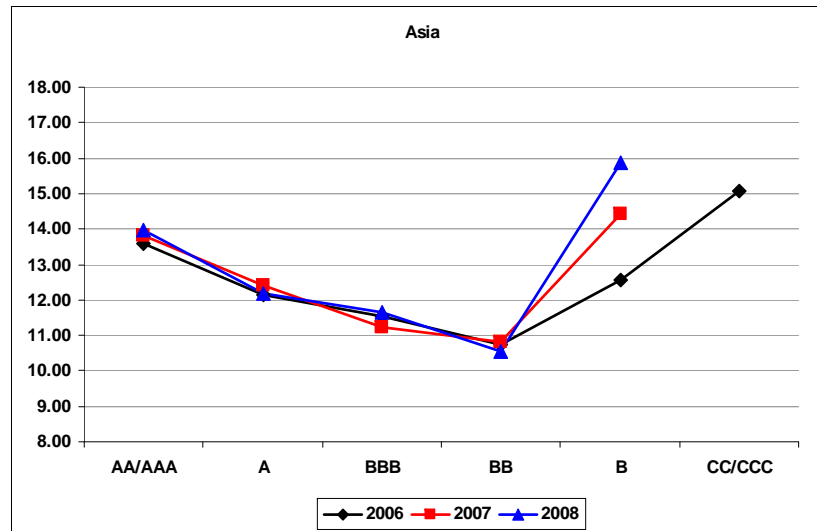
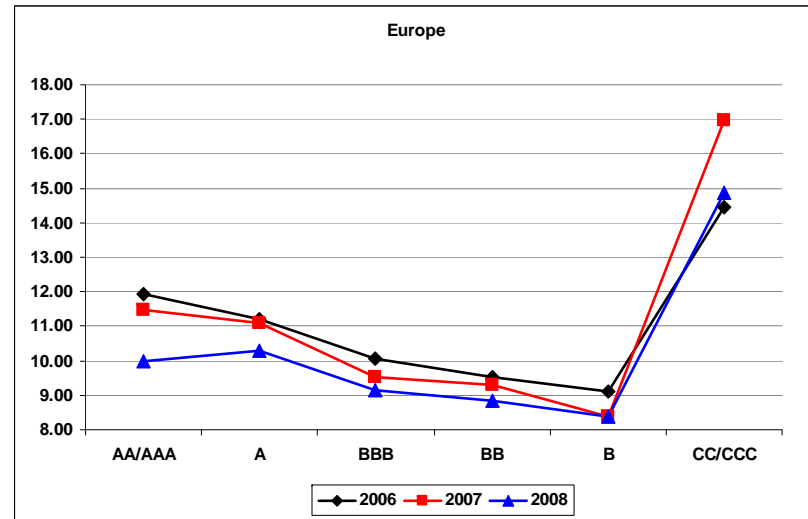
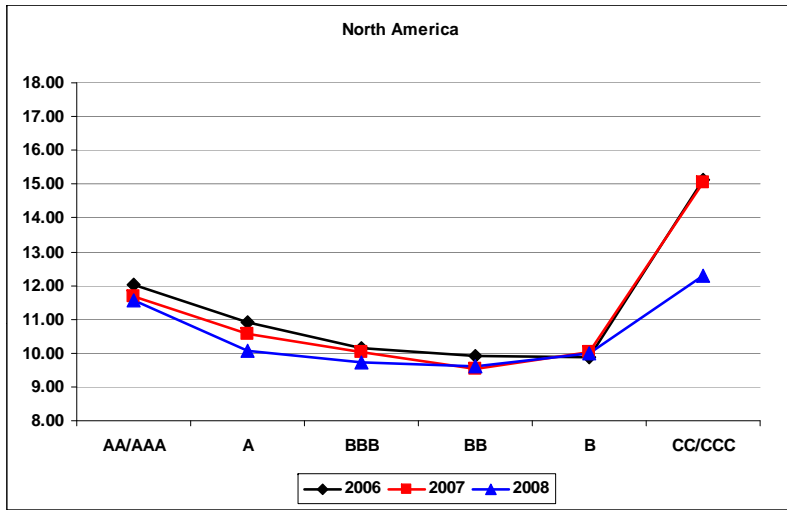


*On average, our model has an accuracy ratio about 70%.*

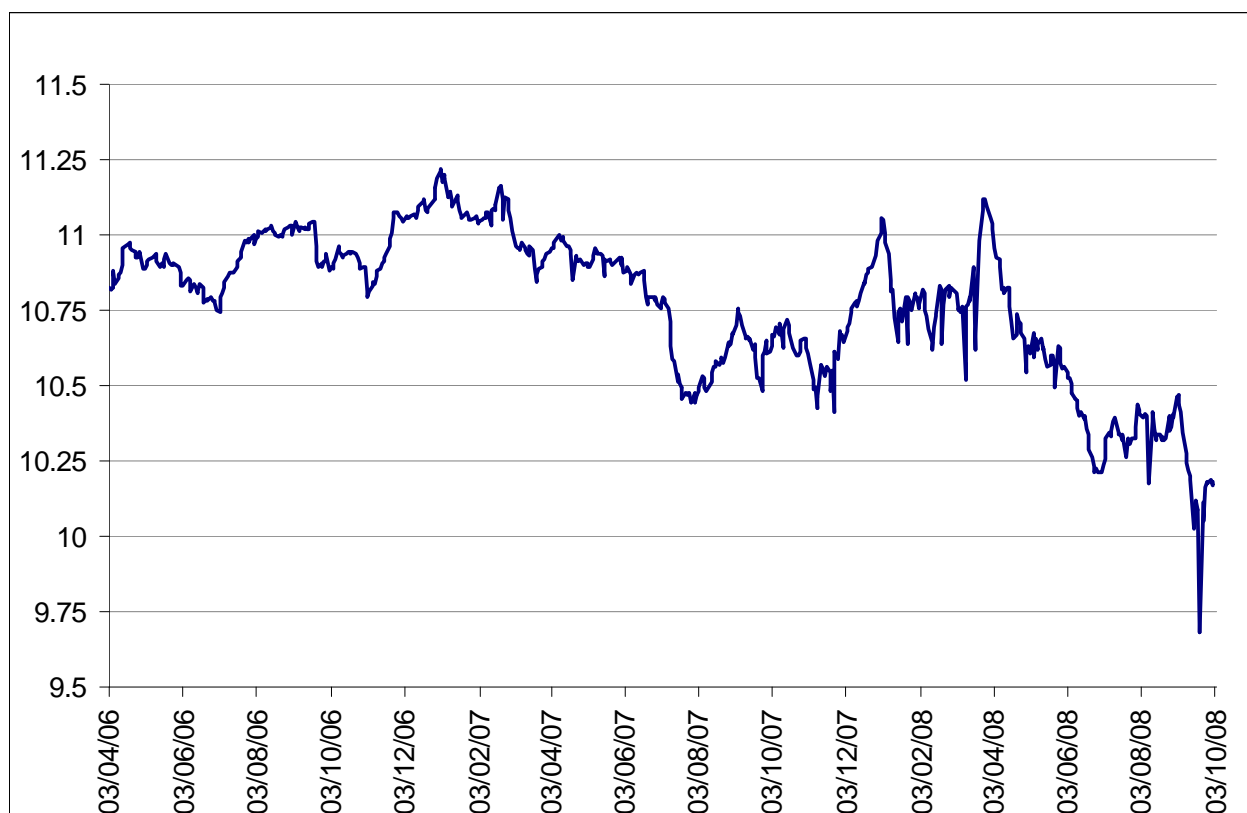
## Liquidity Vs. Credit Over Time



## Liquidity vs. Credit Over Time, By Region

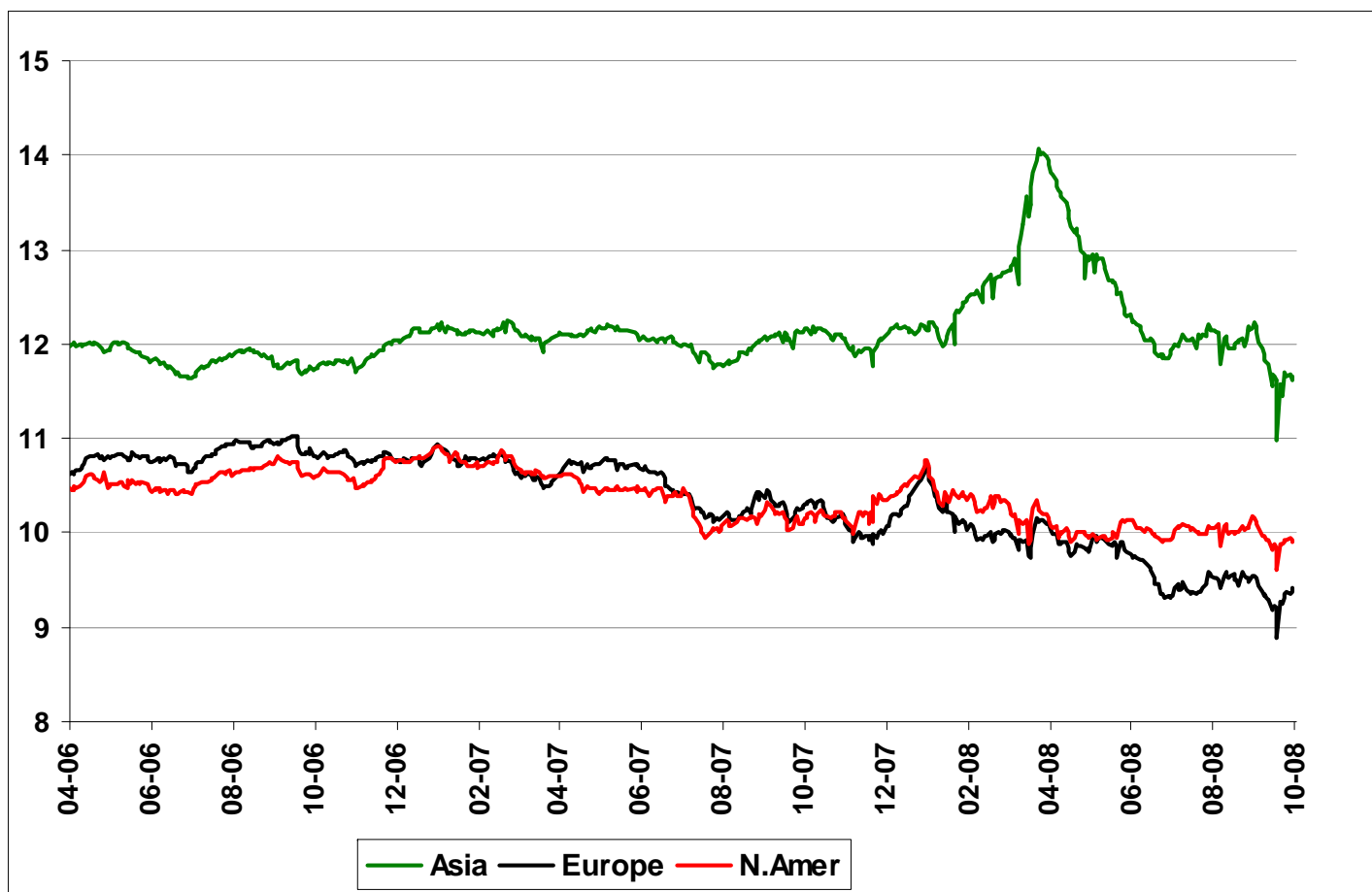


## Dynamics of market liquidity: market average

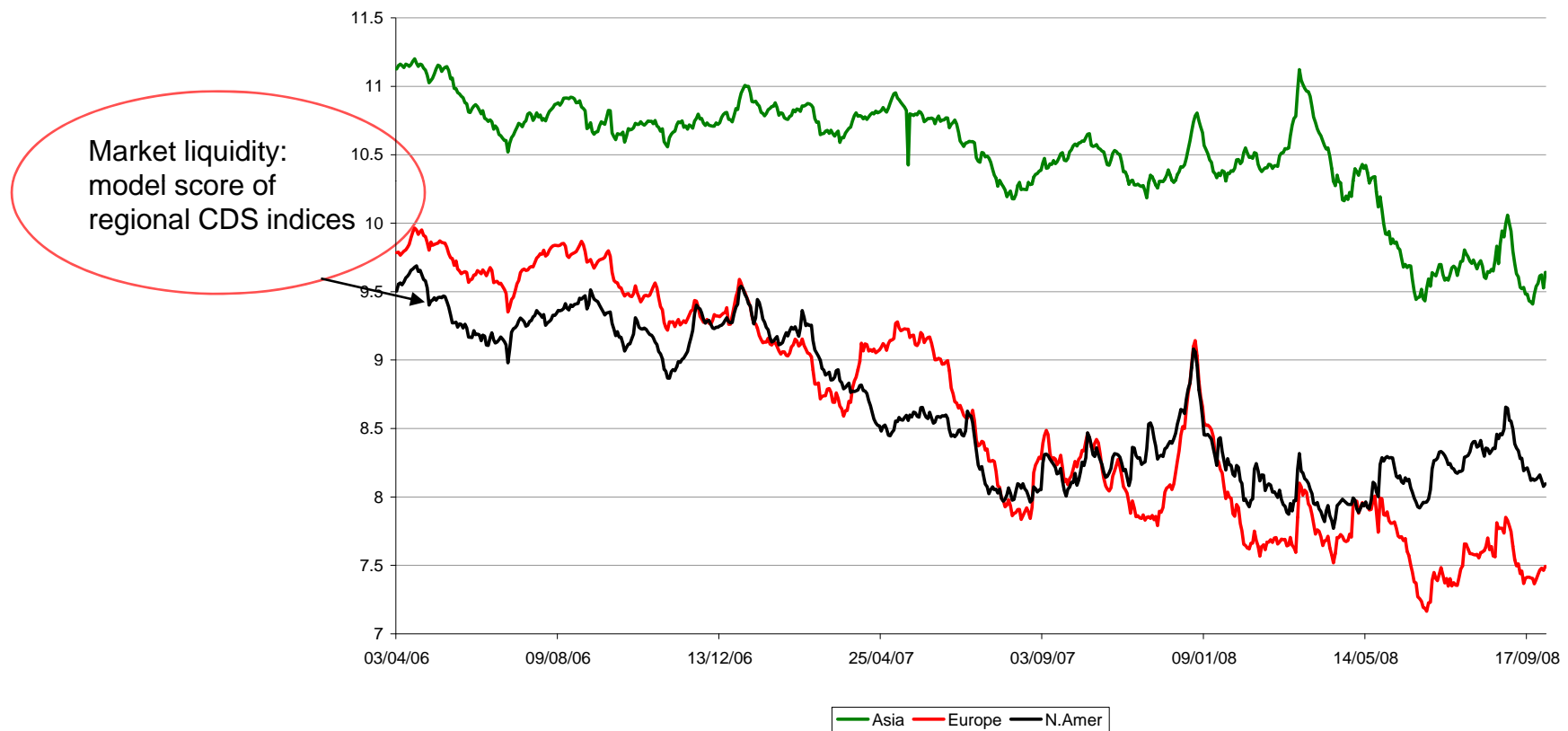


Market liquidity:  
average model  
score across  
reference entities

## Dynamics of Regional Market Liquidity

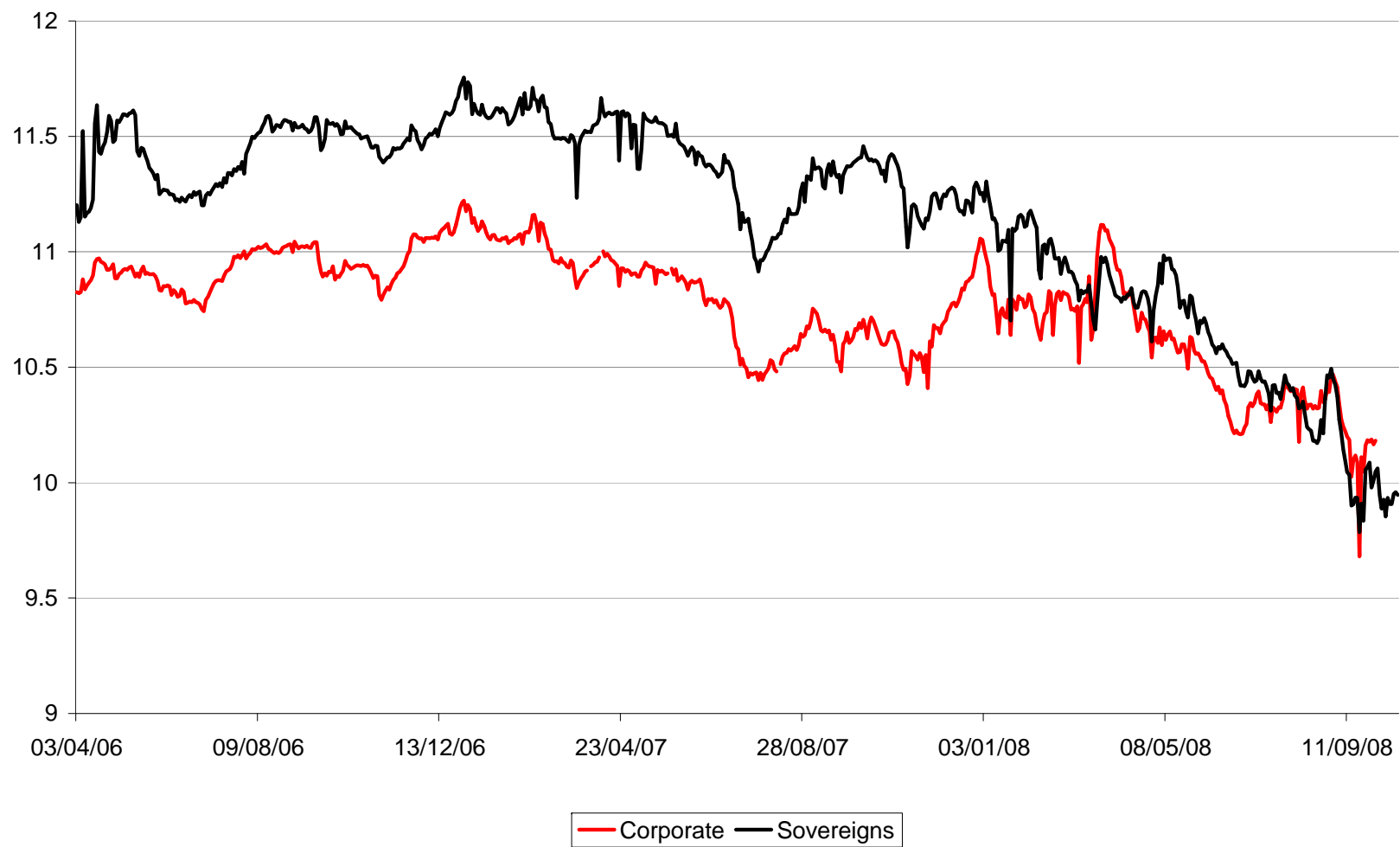


## Dynamics of market liquidity: CDS indices

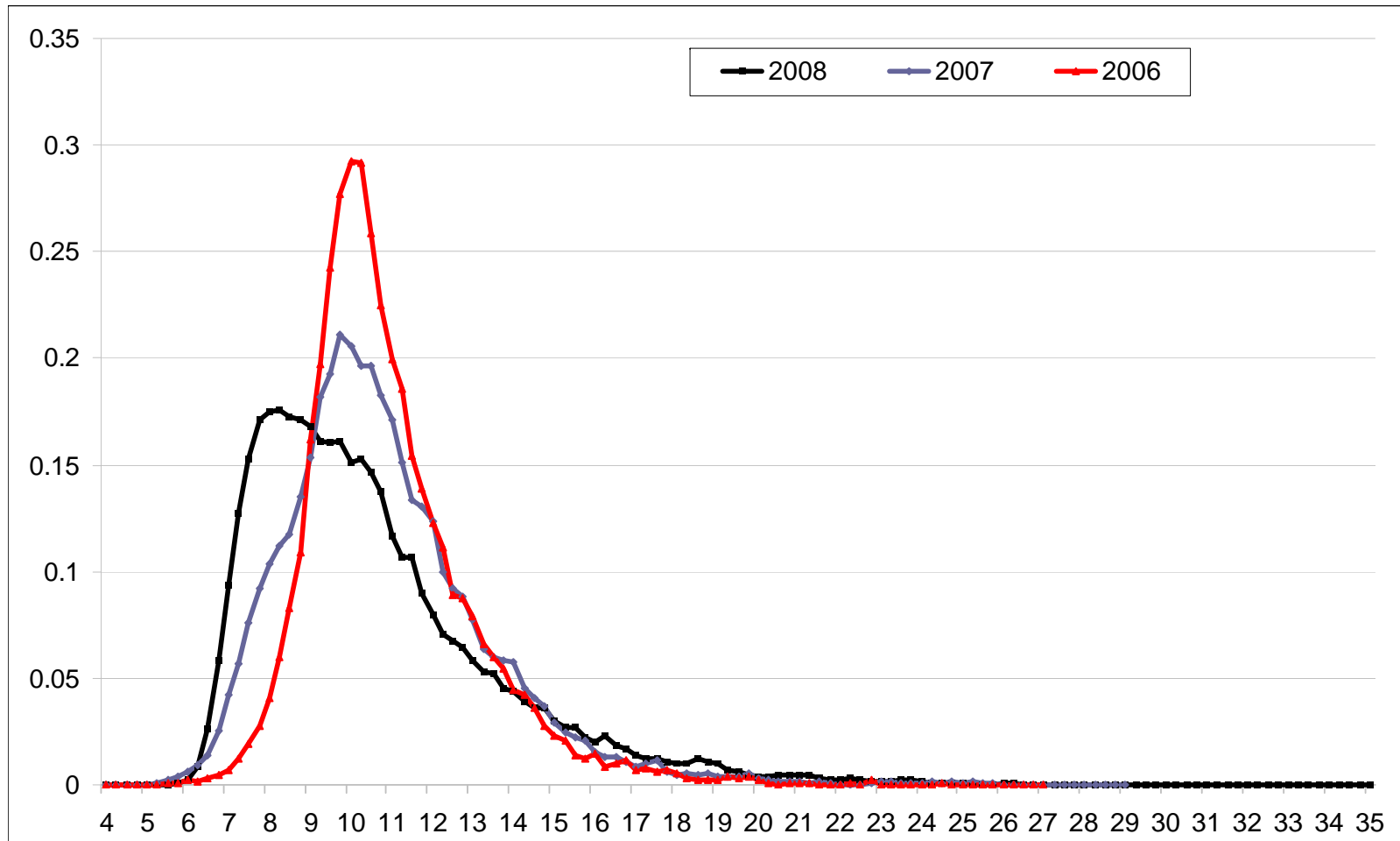


> CDS Indices: iTraxx Europe and CDX closer together (in 2007) than iTraxx Asia

## Corporate and Sovereigns Liquidity

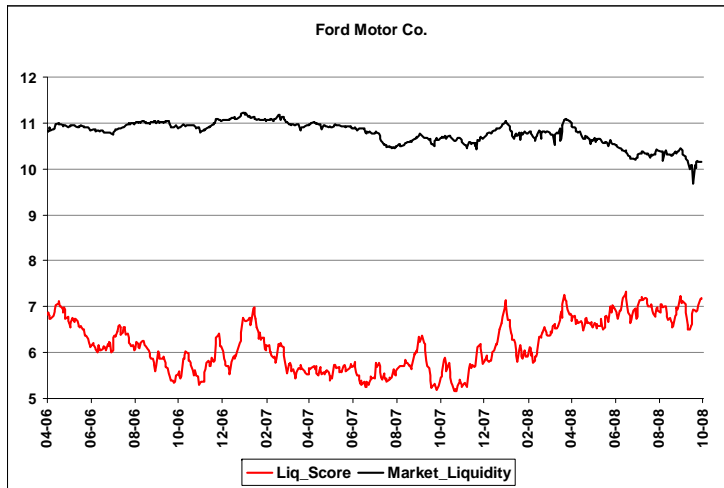


## Liquidity Distribution Over Time

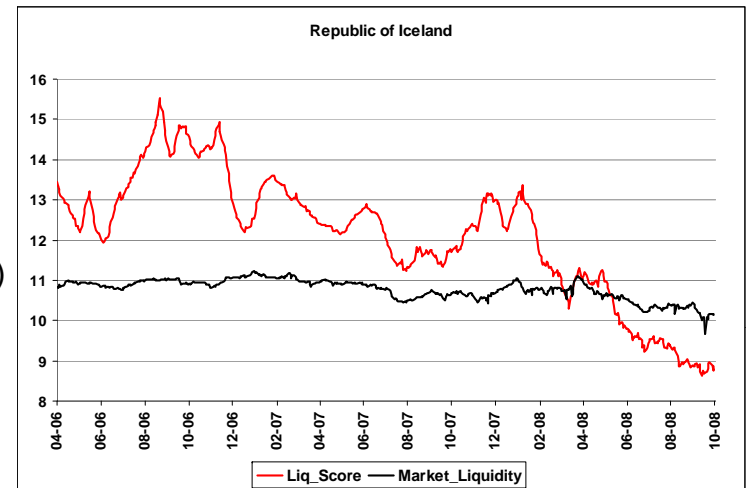


# Dynamics of individual scores vs. the market

➤ Ford Motor  
(1/1/3)

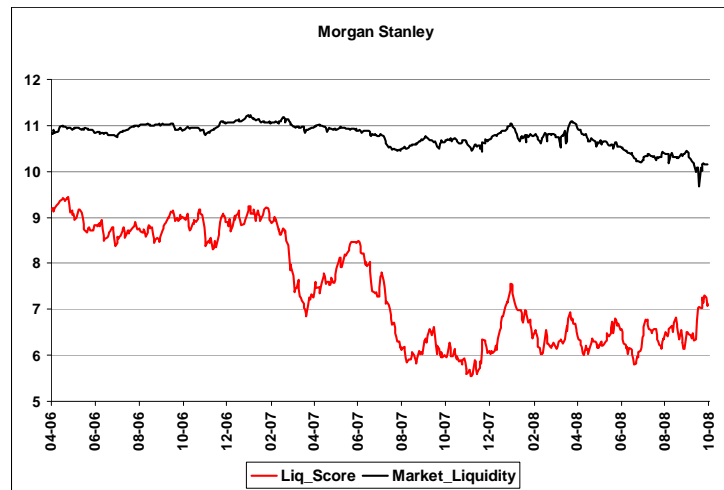


➤ Iceland  
(89/78/54)



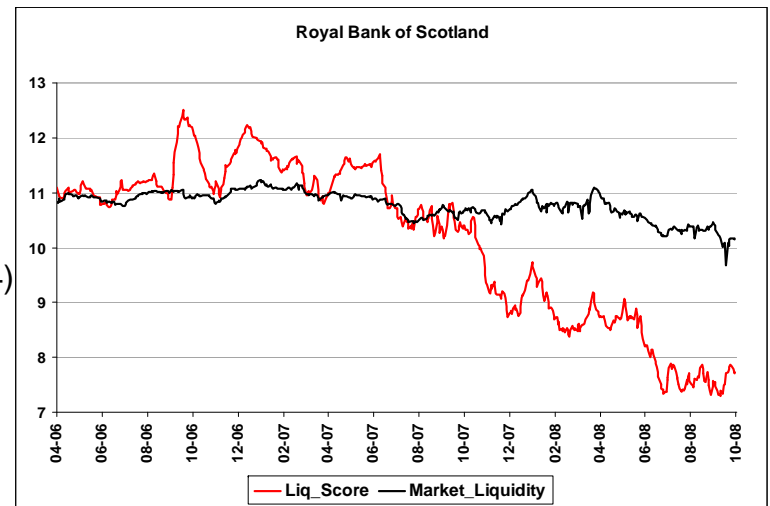
## North American names

➤ Morgan Stanley  
(10/5/2)



## European names

➤ RBS  
(67/55/24)





## Top 10 Liquid Names

	Namefull	Region	Industry	Fitch CDS Implied Rating	Liquidity Score	Global Market Liquidity	Global % Rank
Sep-06	Ford Motor Credit Company LLC	N.Amer	Financials	B-	5.50	11.07	1
	Ford Motor Company	N.Amer	Consumer Goods	C/CCC	5.66	11.07	1
	Republic of Brazil	South America	Sovereign	BB	6.28	11.07	1
	General Motors Corporation	N.Amer	Consumer Goods	C/CCC	6.36	11.07	1
	GMAC LLC	N.Amer	Financials	B	6.81	11.07	1
	Turkey (Republic of) - Bond	Asia	Sovereign	BB	6.84	11.07	1
	Lear Corporation	N.Amer	Consumer Goods	C/CCC	6.88	11.07	1
	Colombia (Republic of)	South America	Sovereign	BB	6.95	11.07	1
	Visteon Corporation	N.Amer	Consumer Goods	C/CCC	6.99	11.07	1
	Arvinmeritor, Inc.	N.Amer	Consumer Goods	B-	7.04	11.07	1
Sep-08	Turkey (Republic of) - Bond	Asia	Sovereign	BB	5.50	10.26	1
	Republic of Brazil	South America	Sovereign	BBB-	5.54	10.26	1
	Republic of Argentina (Internationa	South America	Sovereign	B-	5.66	10.26	1
	Federation of Russian States	Asia	Sovereign	BBB	5.75	10.26	1
	Venezuela (Republic of)	South America	Sovereign	B	5.95	10.26	1
	Colombia (Republic of)	South America	Sovereign	BBB-	6.00	10.26	1
	Kazakhstan	Asia	Sovereign	BB+	6.07	10.26	1
	Thailand (Kingdom of)	Asia	Sovereign	BBB	6.11	10.26	1
	Merrill Lynch & Co., Inc.	N.Amer	Financials	BB	6.13	10.26	1
	Indonesia - Republic of (Bond)	Asia	Sovereign	BB	6.17	10.26	1



## Top 10 Illiquid Names

	Namefull	Region	Industry	Fitch CDS Implied Rating	Illiq Score	Global Market Liquidity	Global % Rank
Sep-06	Parmalat SpA	Europe	Consumer Goods	C/CCC	19.41	11.07	100
	Alberto-Culver Company	N.Amer	Consumer Goods	A	19.49	11.07	100
	Northwest Airlines Corporation	N.Amer	Consumer Services	C/CCC	19.68	11.07	100
	Collins & Aikman Products Co.	N.Amer	Consumer Goods	C/CCC	19.74	11.07	100
	Futaba Industrial Co., Ltd	Asia	Consumer Goods	A	19.98	11.07	100
	Tembec Industries Inc.	N.Amer	Basic Materials	C/CCC	20.09	11.07	100
	Kreditanstalt fur Wiederaufbau	Europe	Financials	AA+	21.37	11.07	100
	Delta Air Lines Inc.	N.Amer	Consumer Services	C/CCC	22.20	11.07	100
	Calpine Corporation	N.Amer	Utilities	C/CCC	22.75	11.07	100
	British Energy plc	Europe	Utilities	C/CCC	24.52	11.07	100
Sep-08	Japan Pulp and Paper Co., Ltd.	Asia	Basic Materials	AA-	20.82	10.26	100
	Dana Corporation	N.Amer	Consumer Goods	B	20.95	10.26	100
	Snap-on Incorporated	N.Amer	Consumer Goods	BBB+	21.20	10.26	100
	Toronto Dominion Bank	N.Amer	Financials	A+	21.42	10.26	100
	Northwest Airlines Corporation	N.Amer	Consumer Services	B-	21.54	10.26	100
	KeyCorp	N.Amer	Financials	BBB-	22.29	10.26	100
	Belluna Co Ltd	Asia	Consumer Services	BB	22.42	10.26	100
	Nan Ya Plastics Corporation	Asia	Basic Materials	A+	22.42	10.26	100
	DekaBank Deutsche Girozentrale	Europe	Financials	AA+	22.76	10.26	100
	Delphi Corporation	N.Amer	Consumer Goods	B+	23.65	10.26	100

## Summary

### > CDS Liquidity Product

- > Liquidity score and associated percentile ranking with analysis:
  - > by Credit Quality
  - > by Sector
  - > by Region
- > Liquidity measure *net of credit*
- > Market liquidity score
  - > Benchmark for users
- > Changes in percentile rankings reveal liquidity dynamics