ANDIMA
National Association of Financial Market Institutions
Brazil

Price Discovery and Liquidity in Brazilian Bond Markets

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ANDIMA Technical Area

June 2008

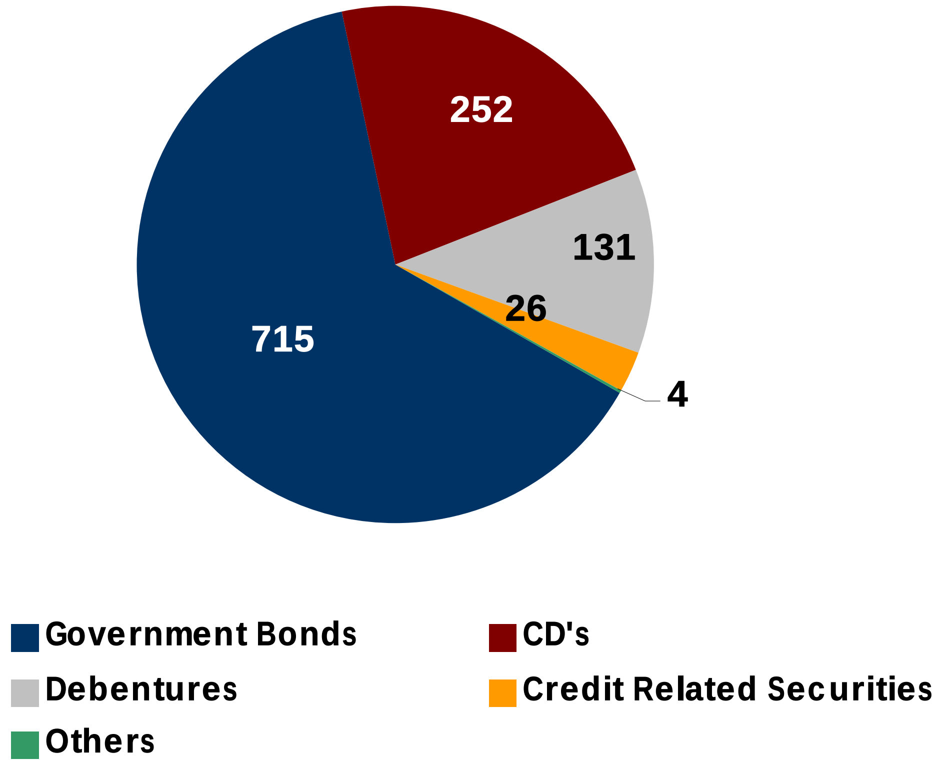
ANDIMA

- **Objectives**
  - **Representation**
  - **Transparency**
  - **Self-regulation**
  - **Infrastructure**

- **Focus in the fixed income market**

Fixed Income Market

Predominance of Government Bonds - US$ billion



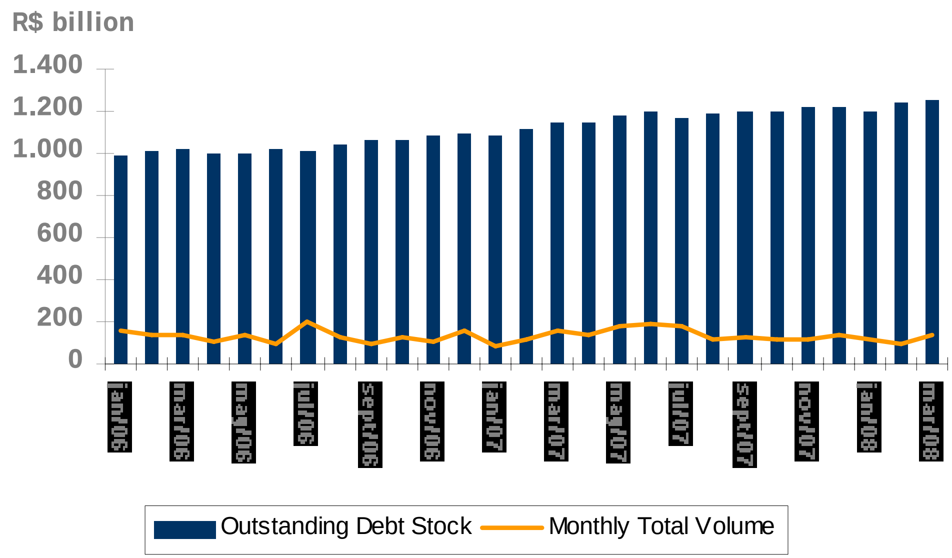
Fixed Income Market

- **Agents**
  - Banks, securities firm and broker dealers
- **Investors**
  - Investment and pension funds and foreign investors
- **Issuers**
  - Treasury: Government Bonds
  - Banks: CDs/DI
  - Corporations: Debentures
- **Trading**
  - Predominant OTC

Fixed Income Market

- **Macroeconomics improving**
- **Credit growth**
- **Liquidity remains low**
  - Strong presence of issuers
  - Short maturities
  - Narrow investors base
  - Strategies in the derivatives market
  - Hold to maturity behavior

Government Bonds Market



Fixed Income Market

- **Recent History**
  - Monthly issuing schedule and disclosure of Treasury Annual Planning
  - Fewer maturities and building of term structure
  - Change in a government debt profile
    - Reduction in exchange exposition
    - Longer term nominal bonds (with coupons)
    - Increasing of inflation linked bonds issuance
    - Reduction of zero duration bonds share
  - Longer duration of domestic currency bonds issues abroad
  - Central bank securities lending program and longer term repos
  - Tax changes for foreign investors acquisitions

Recent History

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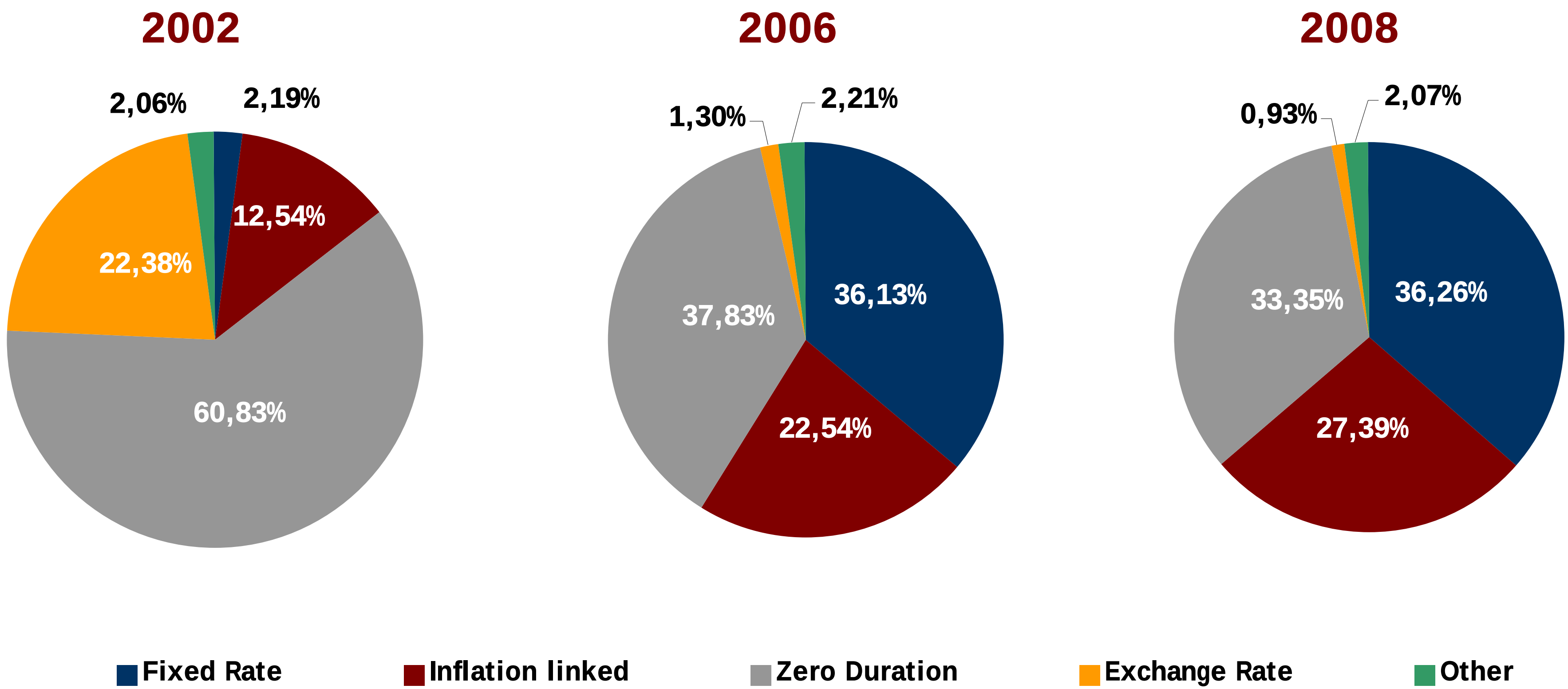
- **Since 2003, the number of maturities was reduced by 60%**

Years	Fixed Rate		Inflation linked		Exchange Rate		Zero Duration	Total
	LTN	NTN-F	NTN-B	NTN-C	NTN-D	NBCE	LFT	
2003	6	1	7	9	18	12	111	164
2004	6	1	8	10	8	4	88	125
2005	9	3	10	7	4	2	67	102
2006	8	4	13	5	1	0	49	80
2007	8	8	14	5	1	0	34	70
In 11/4/2008	8	7	15	4	1	0	32	67

Recent History

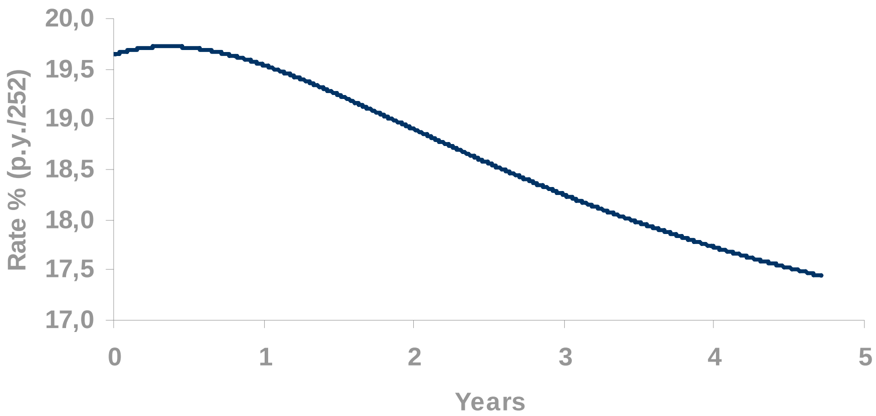
• Change in a Government Debt Profile (%)



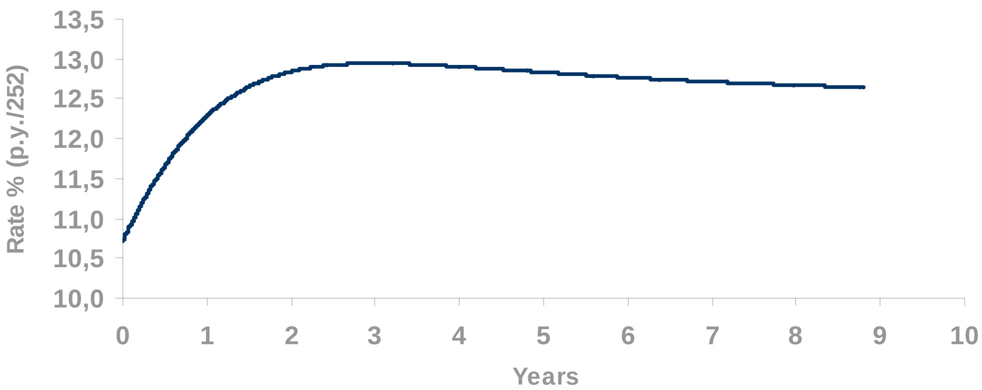
Recent History

- **Building of a term structure**

Zero Coupon Yield Curve - 4/6/2005



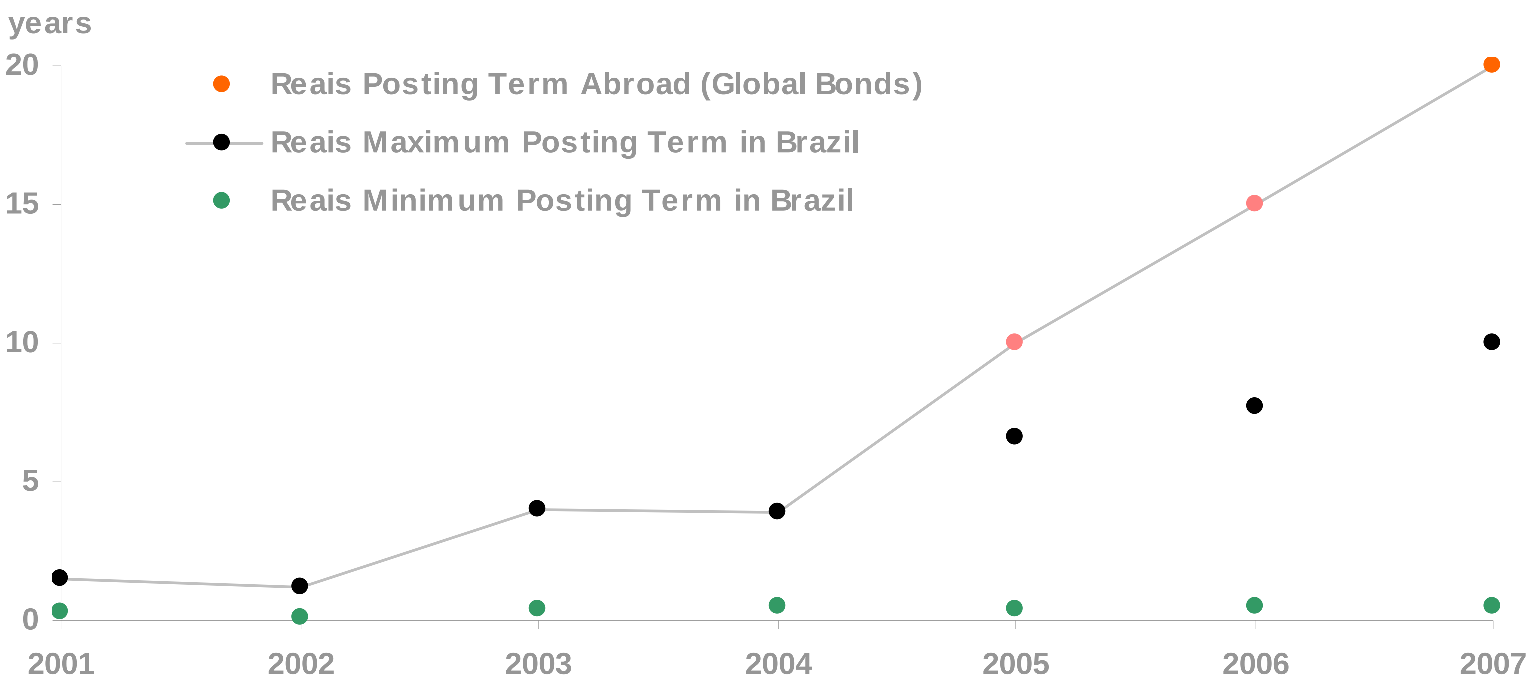
Zero Coupon Yield Curve - 3/11/2008



Recent History

- **Longer duration of domestic currency bonds**

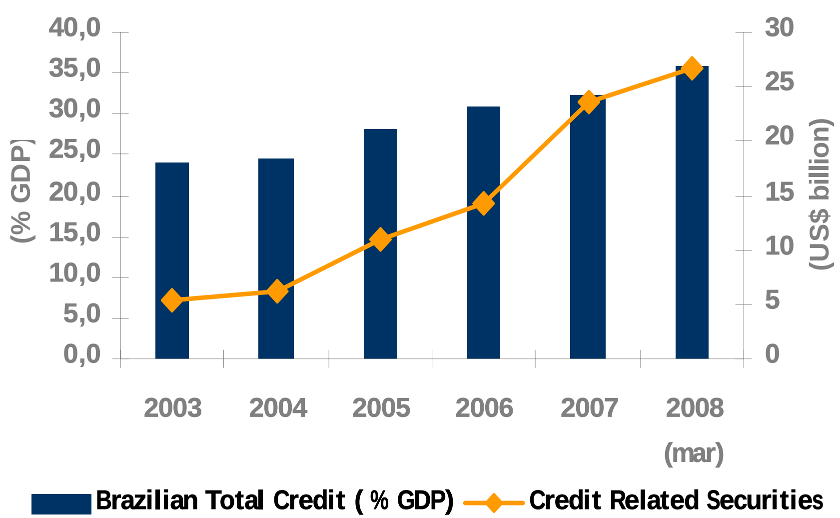
Fixed Rate Bonds Issuing Term



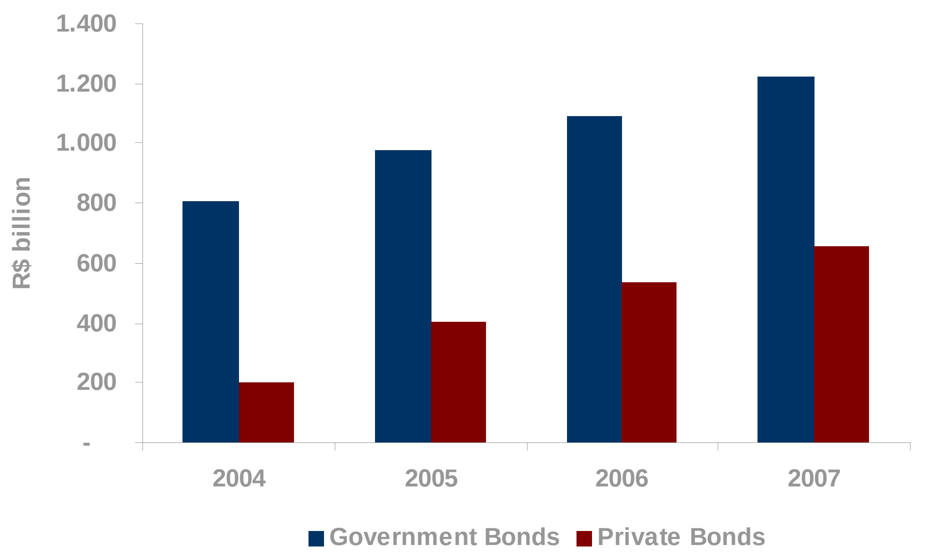
Recent History

- **Macro improving + credit growth**
  - Capital Market issuance records ➡ Debentures
  - New instruments

Brazilian Total Credit X Credit Related Securities



Government Bonds X Private Bonds



Liquidity

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- **Strong Presence of Issuers**

Number of Yearly Auctions

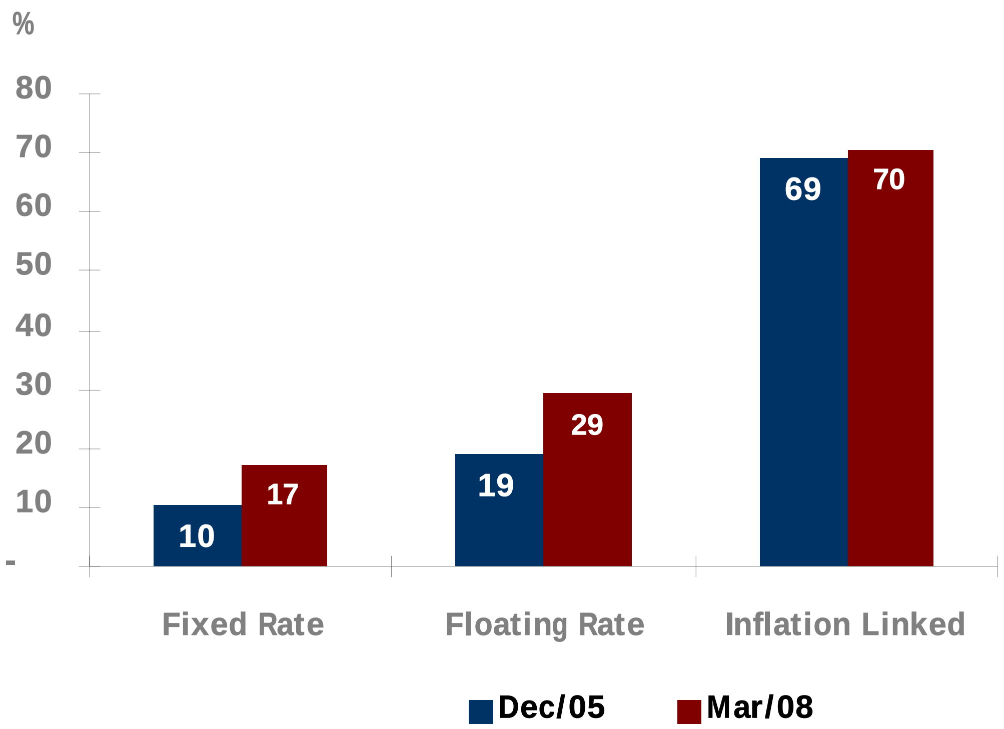
Year	Fixed Rates		Inflation Linked		Zero Duration		Total
	Changes	Primary Offer	Changes	Primary Offer	Changes	Primary Offer	
2003	0	51	0	21	36	46	154
2004	0	77	0	53	20	47	197
2005	5	131	0	85	29	49	299
2006	7	123	0	50	10	22	212
2007	45	116	0	34	18	21	234
2008 (up june)	11	53	0	17	6	0	87

Remark: includes same bond switching, excludes different bond switching.

Liquidity

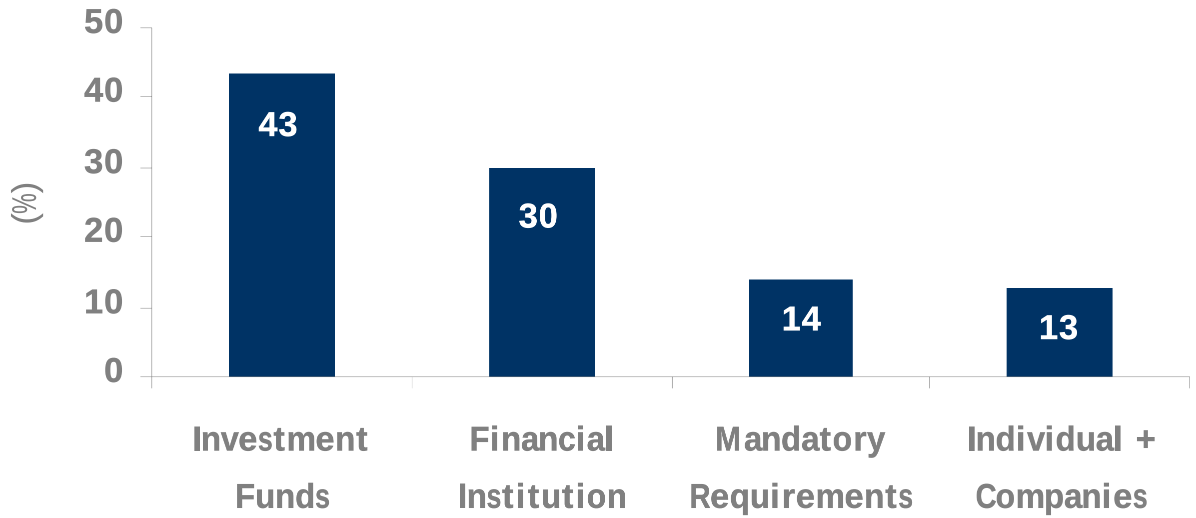
- **Short Maturities**

Average terms in months



Liquidity

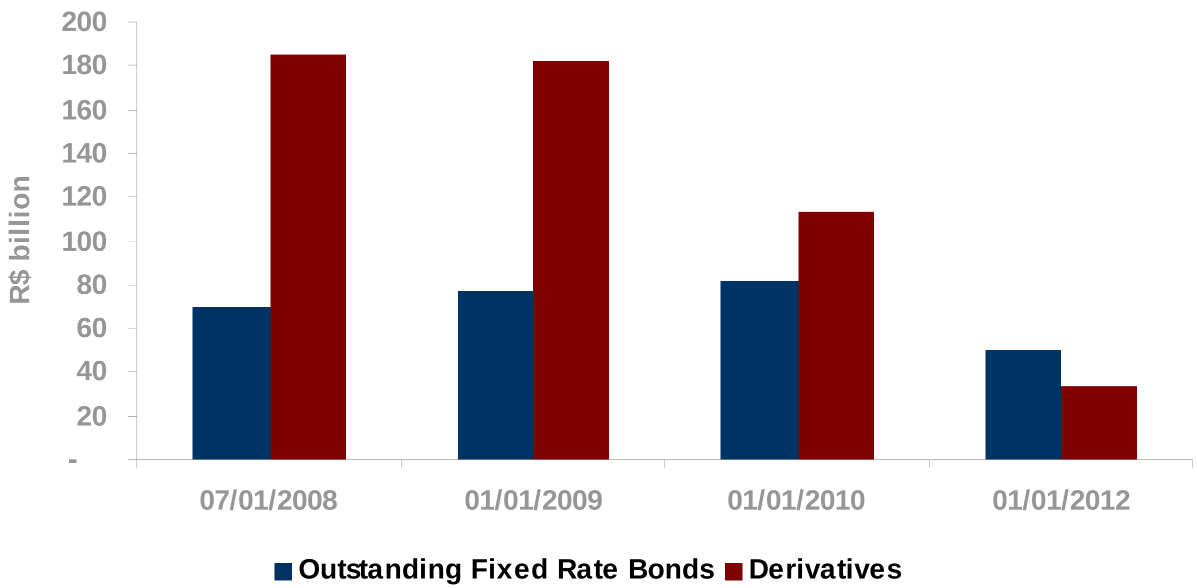
- **Narrow base of investors**



Liquidity

- **Strategies in the derivative markets**
  - Fixed Rates Bonds matched in derivatives = synthetic operations

Outstanding stock X Derivative (Fixed Rate)

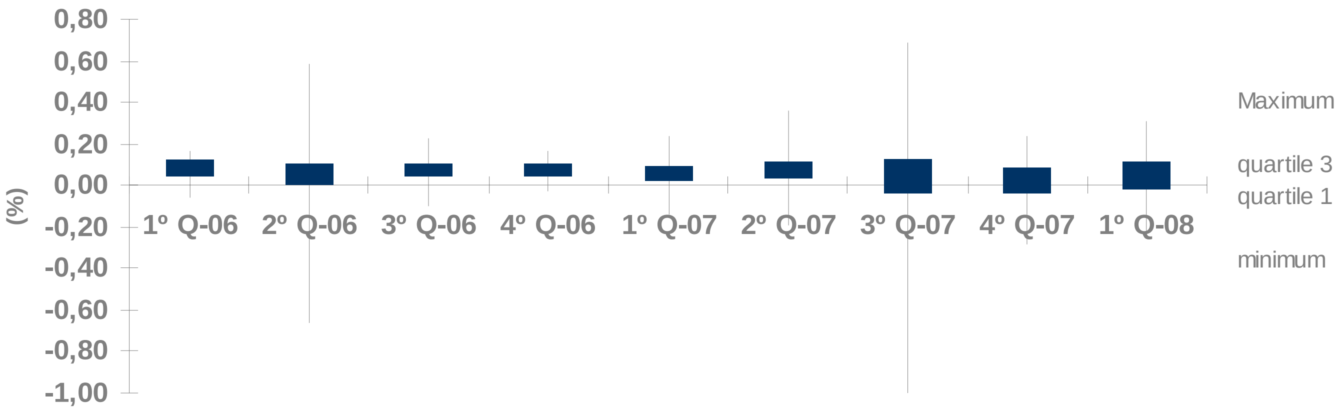


Liquidity

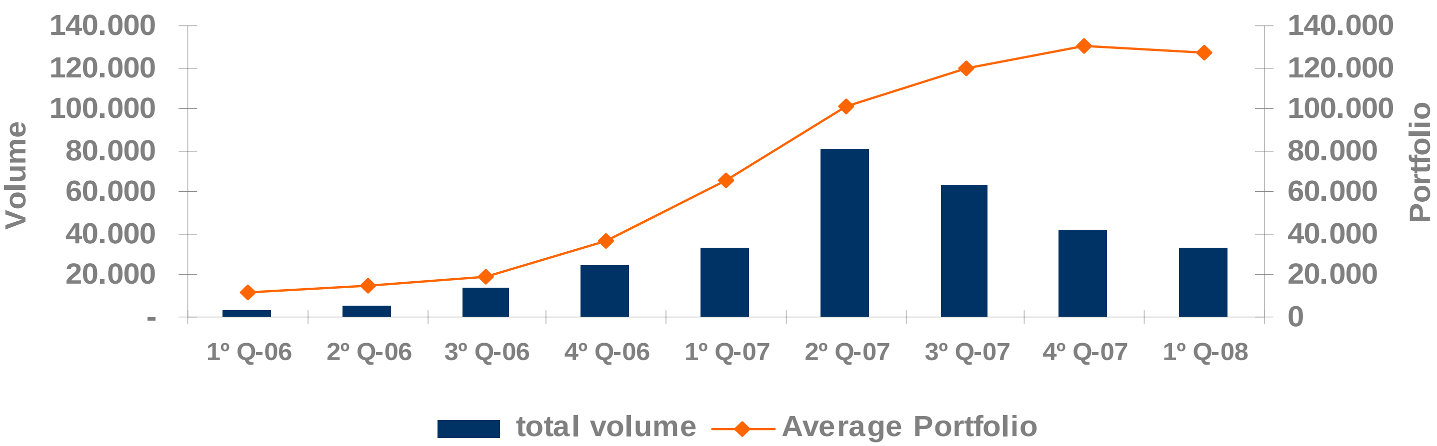
- **Hold to maturity behavior**
  - Historical reasons
  - Zero duration bonds (still 35% of outstanding stock) + synthetic operation
  - Overnight Interest Rate still represents the main benchmark (ex: 93% of debentures issued)

Liquidity

ANDIMA Fixed Income Index (Fixed Rate Bonds) - Quarterly daily return distribution

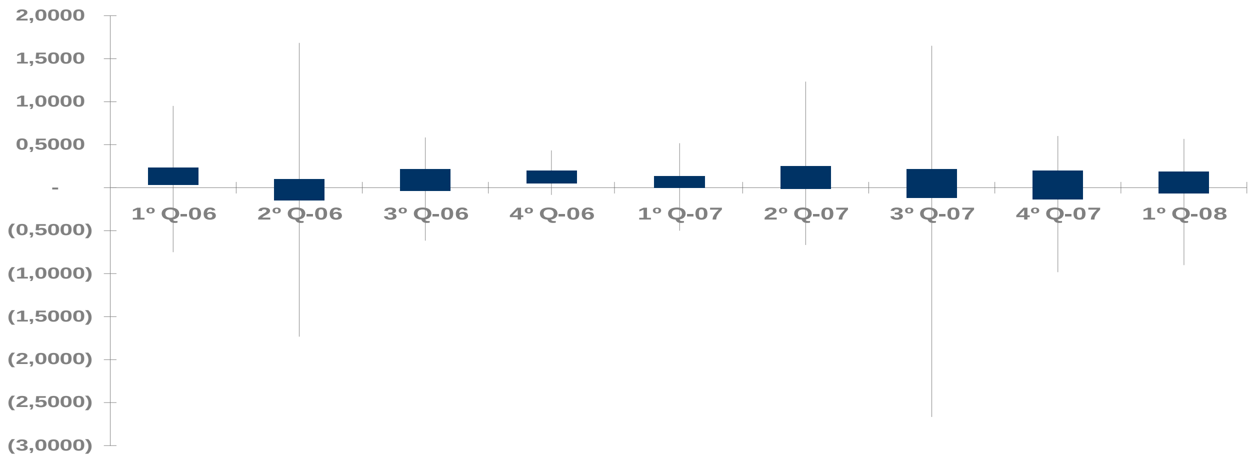


NTN-F - Quarterly total traded volume and average portfolio

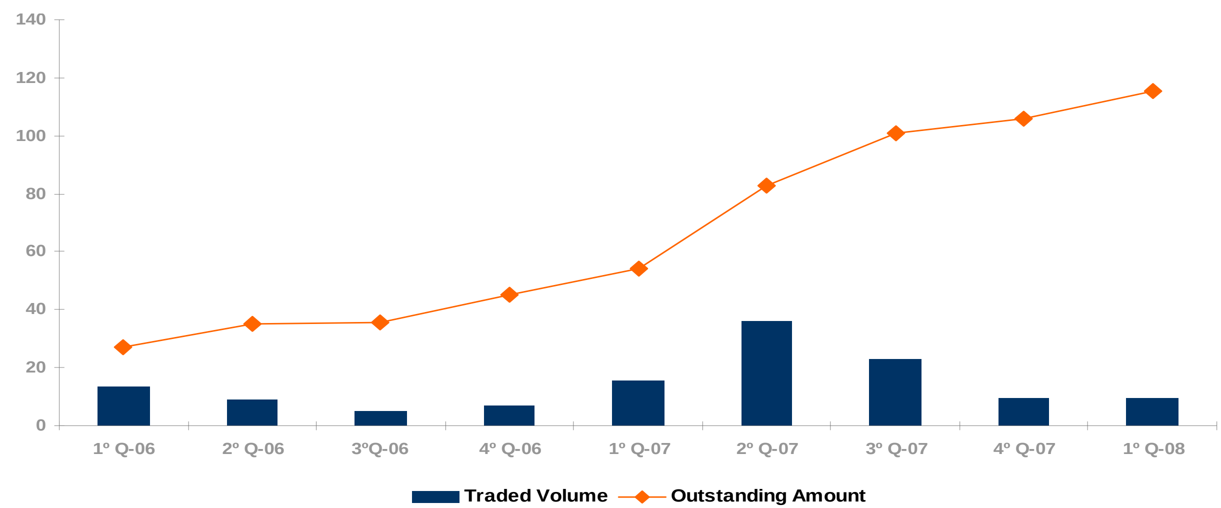


Liquidity

ANDIMA Market Index B5 + (inflation linked bonds above 5 years term)



Traded Volume Term (Price-linked Bonds) - Above 5 years – R$ million



Liquidity Measures

- **Low turnover**

Government Bonds (R$ million)				Private Bonds (R$ million)		
Years	Outstanding (a)	Yearly Traded Volume (b)	Ratio (b/a)	Stock (a)	Yearly Traded Volume (b)	Ratio (b/a)
2004	810.264	2.039.974	2,52	199.095	84.702	0,43
2005	979.662	1.919.822	1,96	403.476	96.602	0,24
2006	1.093.500	1.587.486	1,45	534.045	94.692	0,18
2007	1.224.871	1.666.909	1,36	656.571	116.816	0,18

Without Zero Duration Bond			
Government Bonds (R$ million)			
Years	Outstanding (a)	Yearly Traded Volume (b)	Ratio (b/a)
2004	347.276	1.755.910	5,06
2005	472.506	1.618.375	3,43
2006	679.832	1.443.522	2,12
2007	815.846	1.566.470	1,92

Liquidity Measures

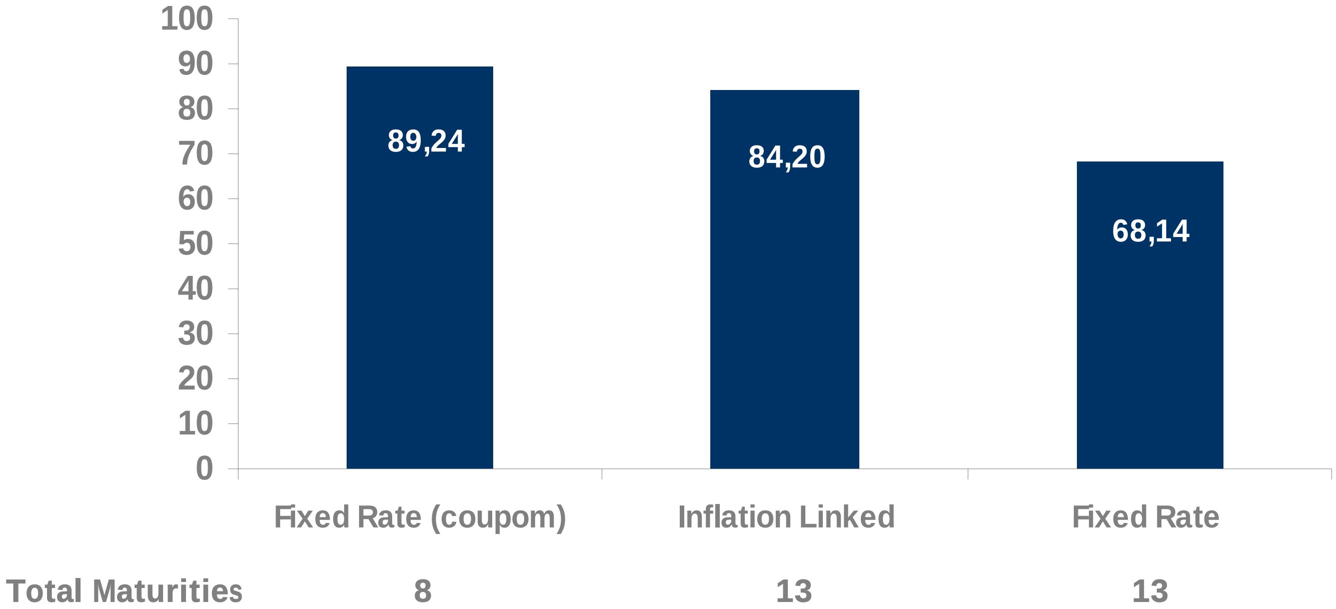
- **Few maturities traded monthly**

In December/07

Number of trades in month	Number of traded maturities				Number of traded maturities	%	% Acum
	Zero Duration	Fixed Rate	Fixed Rate (with coupon)	Inflation Linked			
300+	1	3	--	1	5	7%	7%
200-299	2	2	1	--	5	7%	14%
100-199	6	1	--	3	10	14%	29%
50-99	5	--	3	3	11	16%	45%
30-49	3	1	2	1	7	10%	55%
10-29	1	1	1	2	5	7%	62%
4-9	1	--	--	4	5	7%	70%
1-3	1	--	1	1	3	4%	74%
0	14	0	0	4	18	26%	100%
Total maturities	34	8	8	19	69	--	--

Liquidity Measures

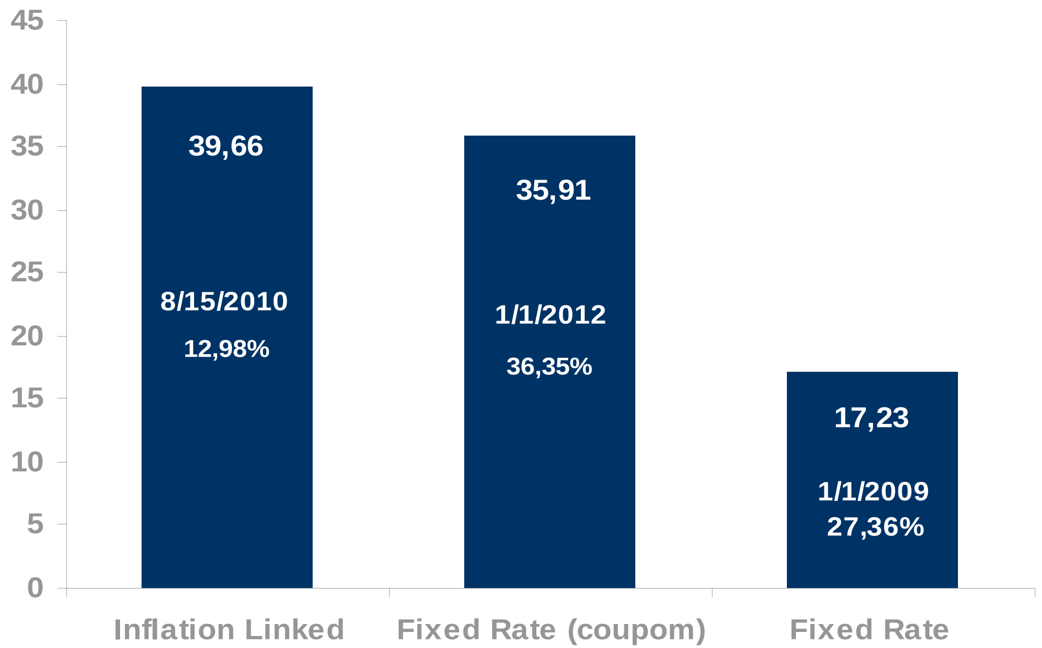
Participation of 5 most traded bonds in secondary total volume 2007/2008 (%)



Liquidity Measures

ANDIMA

Participation of benchmark (most traded bonds) in secondary total volume 2007/2008 and in outstanding



Last issue: 5/29/2006

Last issue: 6/5/2008 (on the run since May/2005)

Last issue: 2/21/2006

Indicative Prices – Why?

- **Effective Prices reflect liquidity imperfections**
  - Low participation of market makers and electronic trading
  - Bid and ask spreads not marketable
  - Multiple brokers and vendors (fragmented information)

Indicative Prices

- **Andima**
  - Developed Indicative Prices
- **Institutional background**
  - Extensive data base
  - Statistical consistency
  - Qualified sources
  - Relationship with Authorities of the segment

Indicative Prices

- **History**

  - 1999 - Formal Delegation from National Treasury and Central Bank
    - Exchange Rate Bonds
    - Nominal Bonds
  - 2000 – Release at Internet
  - 2002 – Mark to Market Rules
    - Confidence Crises
    - Well succeeded experience
  - 2004 – Debentures
  - 2005 – Agreement with the National Treasury to develop a Fixed Income Index made from Andima's Indicative Price

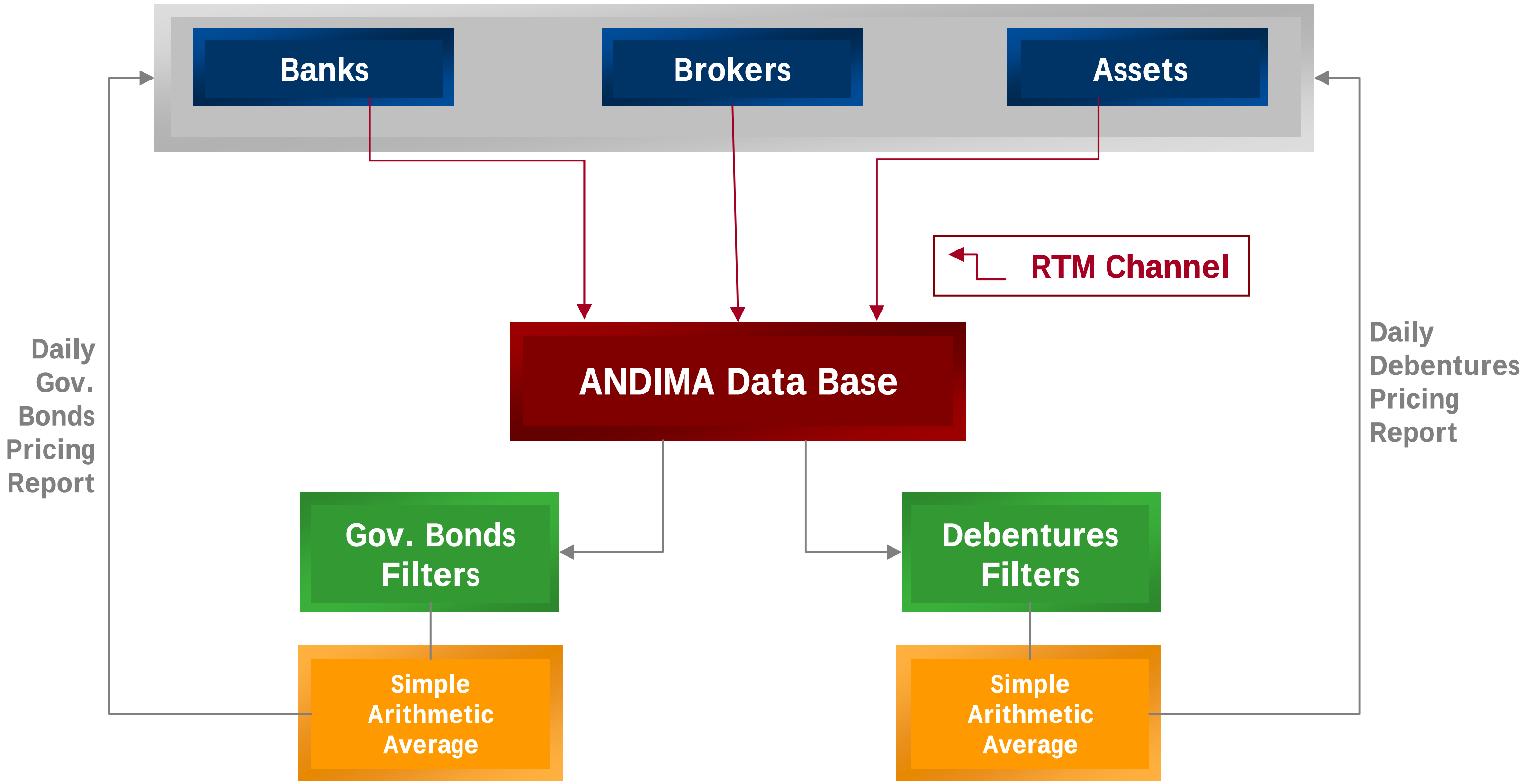
Indicative Prices

ANDIMA

- **Concept**
  - fair price; closing price
- **Maximum and Minimum Prices**
  - observed/traded
- **Daily calculation and disclosure of indicative prices**
  - 100% of the outstanding government bonds maturities
  - 60% of debentures traded
- **Sample of 45 price makers among banks (22), asset managers (14) and securities firms (9)**
- **End of the day indicative range**
- **Available at Internet**

Indicative Prices

Structure



Indicative Prices

ANDIMA

Secondary Market of Public Bonds

Home > Brazilian Financial System > **Secondary Market of Public Bonds**

[Glossary]

Federal Public Bonds									06/17/2008
FIXED RATE bonds		National Treasury Bills (LTN) - Rate (% p.y.)/252							
SELIC Code	Base Date/ Issurance	Expiry Date	Maximum Rate	Minimum Rate	Indicative Rates	Unit Price (UP)	Standard Deviation	Indicative Range	
								Minimum	Maximum
100000	12/07/2005	07/01/2008	12.1800	12.1350	12.1490	995.460408	0.01	12.1416	12.1563
100000	06/01/2007	10/01/2008	12.6631	12.6200	12.6527	964.706909	0.01	12.6475	12.6578
100000	05/05/2006	01/01/2009	13.2757	13.2300	13.2632	932.687192	0.01	13.2579	13.2684
100000	01/11/2008	04/01/2009	13.8936	13.8705	13.8819	901.045300	0.02	13.8667	13.8970
100000	04/05/2007	07/01/2009	14.3681	14.0016	14.3599	869.325735	0.00	14.3552	14.3645
100000	07/06/2007	10/01/2009	--	--	14.7101	836.417745	0.01	14.7026	14.7175
100000	10/05/2007	01/01/2010	14.9055	14.8400	14.8774	806.381885	0.01	14.8716	14.8831
100000	03/07/2008	07/01/2010	15.0269	14.9466	15.0133	751.784268	0.02	14.9978	15.0287

Whenever interpolated, a rate is published in bold characters.

Indicative Prices

- **Advantages**
  - Recognized as fair price for means of MTM of institutions and investors
  - Indicative range used for supervisory means of institutional investors
  - Self regulation tool - promotes convergence without impact trading

- **Limitations**
  - Rely on the sample
    - Representativeness
    - Quality
  - Speed of the changes – adjustment pace
  - Intraday volatility – second best

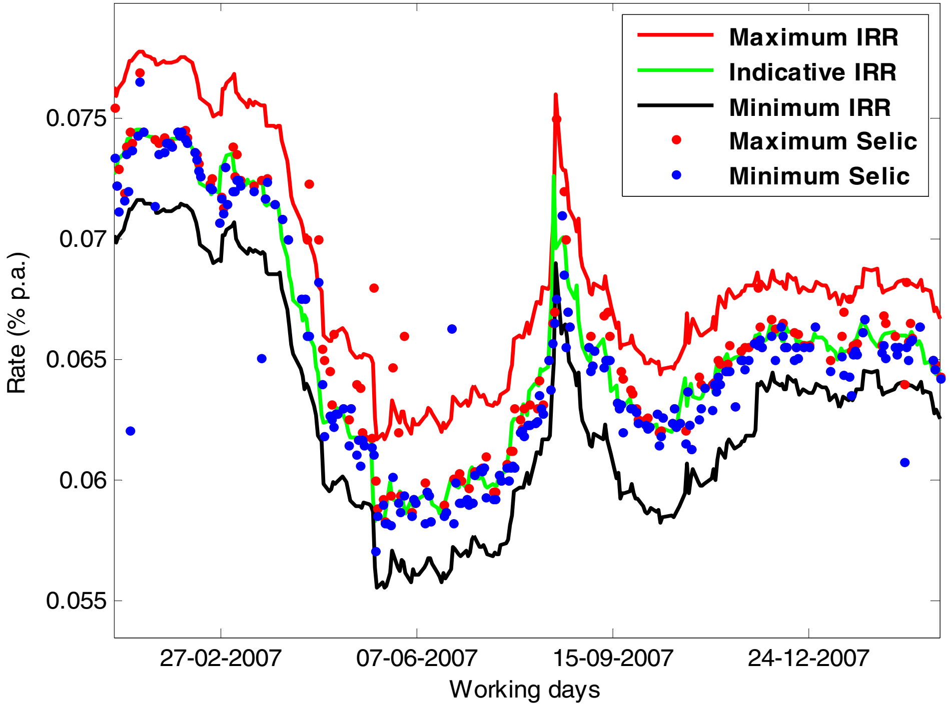
Complementary Tools

- Continuous improving of the sample
- Ranking – Top 5
- Methodological Improvement

Complementary tools

- **New indicative range**
  - Zero coupon curve
  - Building of a specific methodology
  - Next day opening range
- **Next step: monitoring**

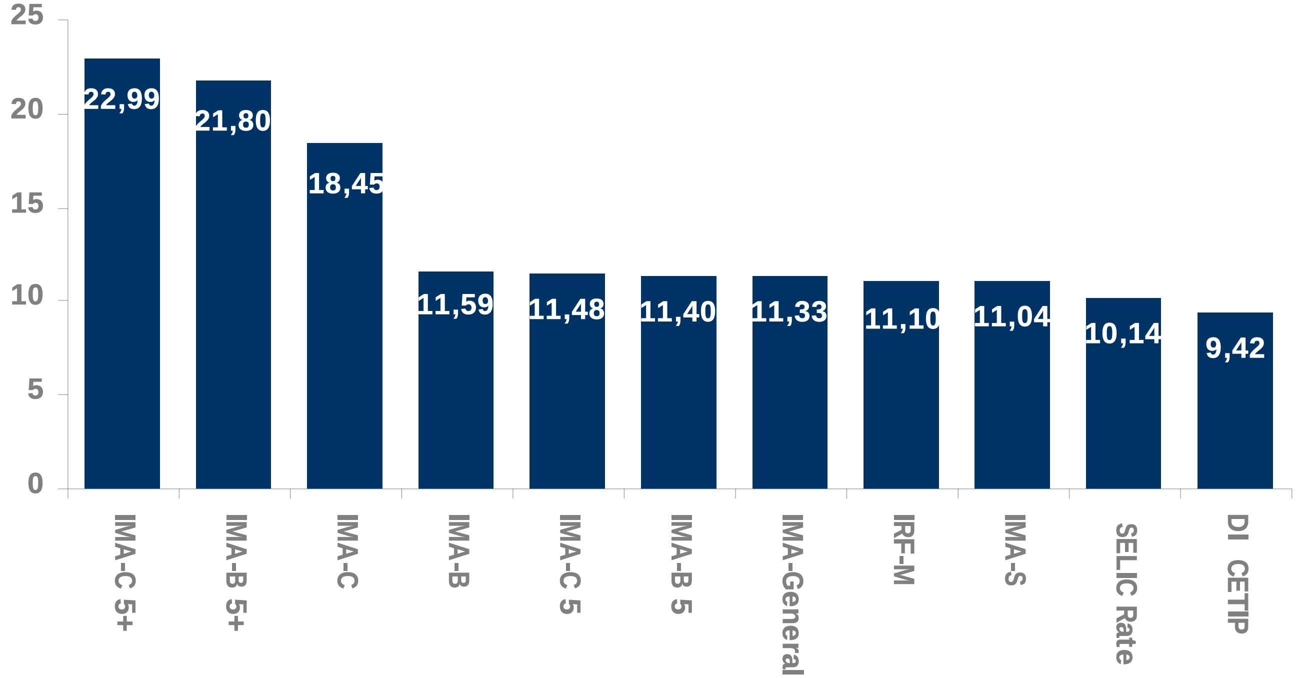
NTN-B 2045



Benchmark

- **Alternative to Short Term Interest Rates Benchmarks**

IMA - ANDIMA Market Index (March/08 - 12 months)



Transparency

ANDIMA

- Intraday Indicative Prices (11:00 and 15:15 hs)
- Electronic Markets (Bid and Ask; trades)
- Calls (Bid and Ask; trades)

Transparency

- **Bond Market Reporting System**
  - Indicative and intraday prices available - consolidation and timely disclosure

ANDIMA's Bond Market Reporting System

Main > Technical Information > Public Bonds > **Online Rates System** | **Methodologics Notes**

Show + Columns

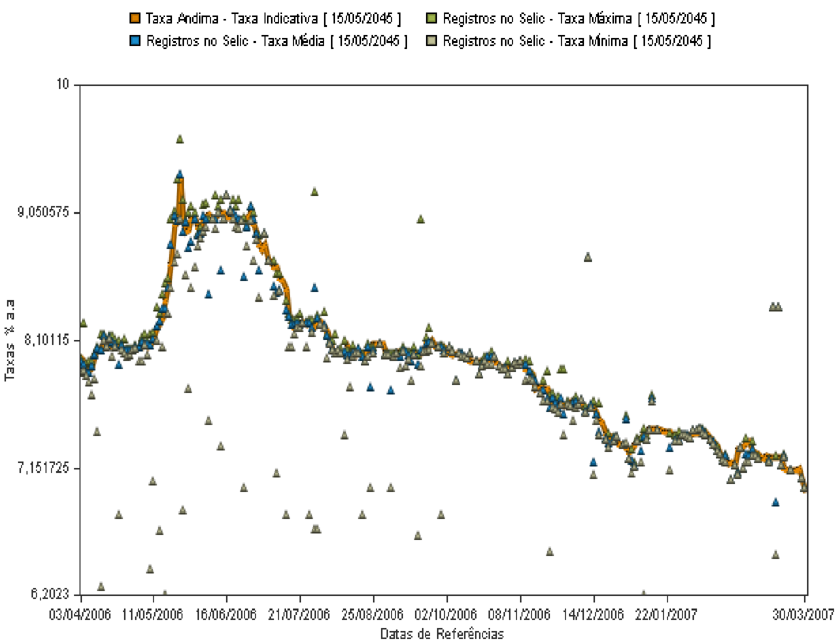
Reference Date : 05/21/2008 Provider : +/- Bonds : +/- Maturity Date : +/- Clear Parameters Print

Last Updated: 15:31:22

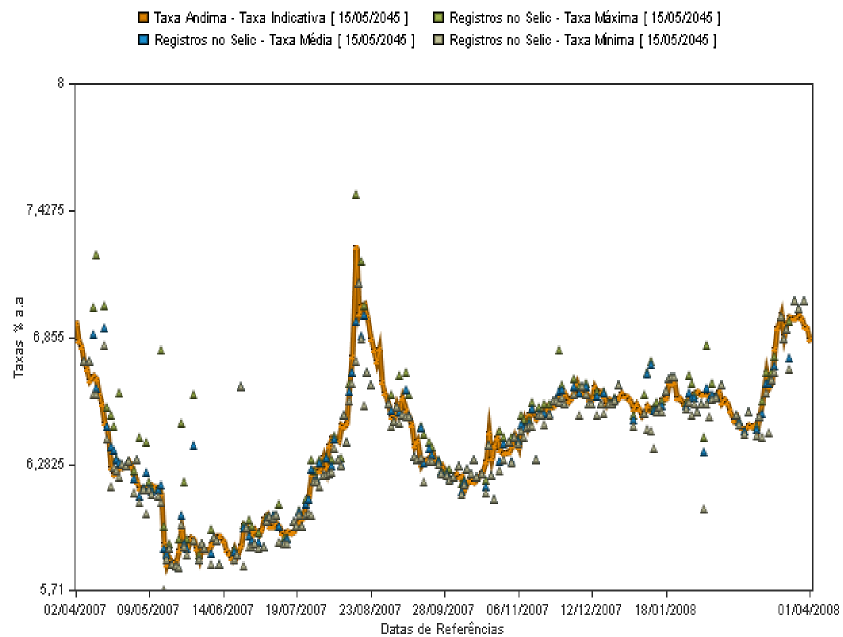
Bonds	Maturity Date	ISIN Code	Provider	Time	Term of Trade	Rate %p.a.					Bid	Ask
						Previous Day	Maximum	Average	Minimum	Last		
LTN	07/01/2008	BRSTNCLTN624	ANDIMA 11H	-	-	11.9989	-	-	-	-	12.0592	12.041
LTN	07/01/2008	BRSTNCLTN624	CALL	10:15:00	-	-	-	-	-	-	12.0800	12.050
LTN	07/01/2008	BRSTNCLTN624	CALL	10:30:00	-	-	-	-	-	-	12.0700	12.050
LTN	07/01/2008	BRSTNCLTN624	CALL	11:00:00	-	-	-	-	-	-	12.0600	12.040
LTN	10/01/2008	BRSTNCLTN673	ANDIMA 11H	-	-	12.6110	-	-	-	-	12.6456	12.630
LTN	10/01/2008	BRSTNCLTN673	CALL	10:15:00	-	-	-	-	-	-	12.6500	12.630
LTN	10/01/2008	BRSTNCLTN673	CALL	10:30:00	-	-	-	-	-	-	12.6500	12.630
LTN	10/01/2008	BRSTNCLTN673	CALL	11:00:00	-	-	-	-	-	-	12.6600	12.640
LTN	01/01/2009	BRSTNCLTN640	BMF	-	FORWARD	-	-	-	-	-	13.1700	13.155
LTN	01/01/2009	BRSTNCLTN640	ANDIMA 11H	-	-	13.1490	-	-	-	-	13.1850	13.175

Transparency

- **COMPARE**
  - Comparison tool - highlight of market imperfections and convergence



NTN-B 45 (apr/2006 to apr/2007)



NTN-B 45 (apr/2007 to apr/2008)

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