STATE STREET®

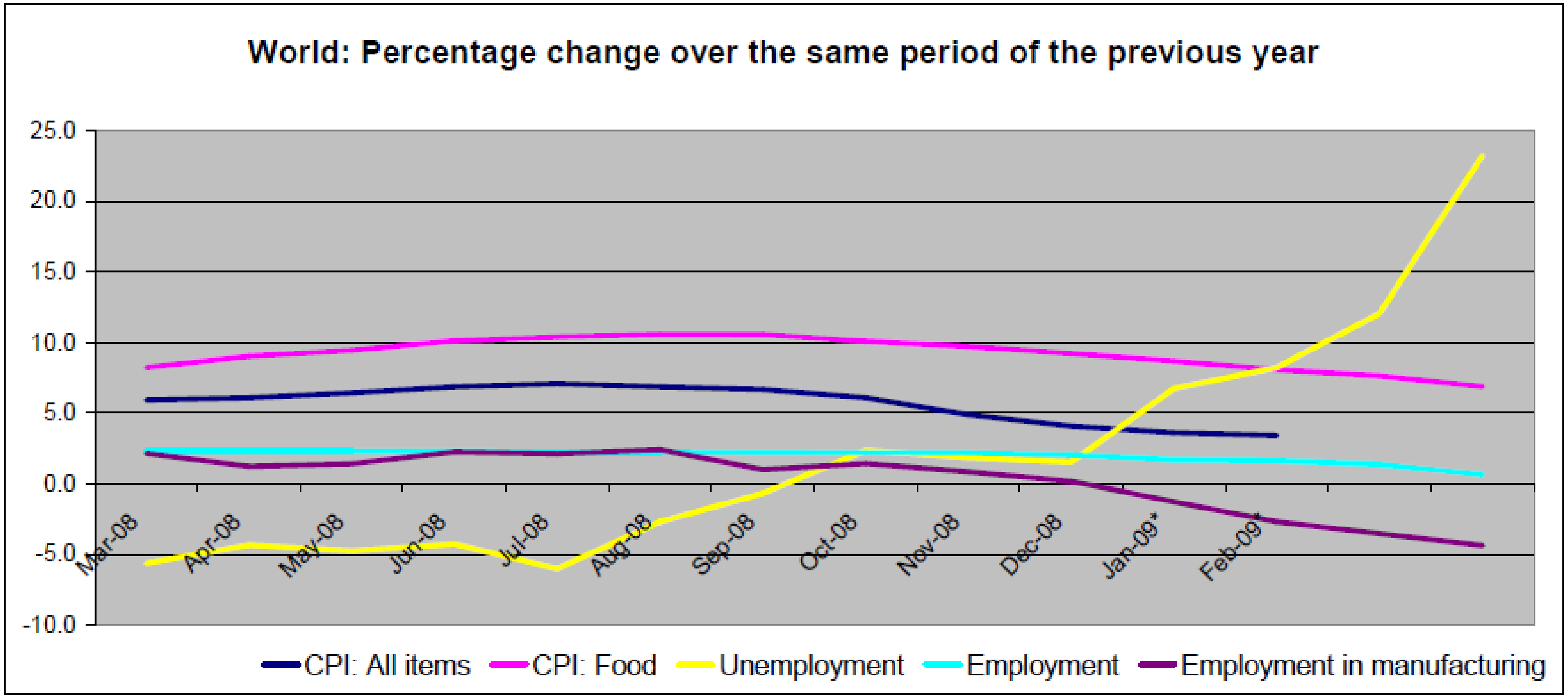
Uncertainty of markets and the costs of its ignorance

Some thoughts arising from financial crisis

June 2009

Reasons for a Change our Economic Thinking (I)

Chart 1: Trends in the International Labor Market (ILO)



Employers have shredded about 25 mil jobs globally. The number of people that will have lost their jobs is expected to increase to about 40 million by year-end: Risk for social unrest increased leading to a higher demand in legitimating.

Reasons for a Change our Economic Thinking (II)

Source: ECB, Congressional Research Service

Table A Published national rescue packs with explicit commitments

(EUR billions)

Country	Capital injection	Asset purchases/ swaps	Guarantees/ loans/credit lines
Euro area			
AT	15	-	85
BE	13	-	-
CY	-	-	-
DE	80	-	400
ES	-	50	100
FI	4	-	50
FR	40	-	320
GR	5	8	15
IE	-	-	485
IT	-	40	-
LU	3	-	-
NL	37	-	200
PT	4	-	20
SI	-	-	8
Other EU			
HU	1	-	1
SE	2	-	150
UK	61	-	306
Other Europe			
CH	4	42	-
NO	-	-	60
Other			
US	683	1,318	1,559

Table 1. Recently Announced and Planned or Proposed Stimulus Packages

Date announced	Country	$Billion	Notes
	United States	819.00	(Proposed)
10-Nov-08	China	586.00	
16-Nov-08	Italy	101.00	
5-Nov-08	France	33.00	
27-Nov-08	Spain	66.10	
14-Jan-09	Germany	35.00	(Proposed)
22-Nov-08	Netherlands	7.50	
24-Nov-08	United Kingdom	29.60	
14-Jan-09	Portugal	2.09	
20-Nov-08	Israel	5.40	
21-Dec-08	Switzerland	0.59	
5-Dec-08	Sweden	2.70	
26-Jan-09	Norway	2.08	
20-Nov-08	Russia	20.00	
3-Dec-08	Egypt	3.97	
13-Dec-08	Japan	250.00	
3-Nov-08	S. Korea	14.90	
16-Dec-08	Vietnam	6.00	
28-Jan-09	Indonesia	6.32	(Proposed)
21-Jan-09	Philippines	6.90	(Planned)
29-Jan-09	Thailand	3.35	
22-Jan-09	Singapore	13.70	
30-Nov-08	Malaysia	2.00	
8-Dec-08	India	4.00	
28-Nov-08	Taiwan	15.60	
31-Dec-08	Sri Lanka	0.14	
26-Jan-09	Australia	2.60	
7-Jan-09	Mexico	54.00	
23-Dec-08	Brazil	3.60	
5-Dec-08	Argentina	3.80	
6-Jan-09	Chile	4.00	
27-Jan-09	Canada	32.00	
Total		2,138.54	

Source: Various news articles.

Notes: Currency conversions to U.S. dollars were either done in the news articles or by using current exchange rates.

Governments backed financial institutions world-wide by USD 5 trillion whereby the real economy got a stimulus package of about USD 2 trillion. What have the government got for our (tax payers) money?

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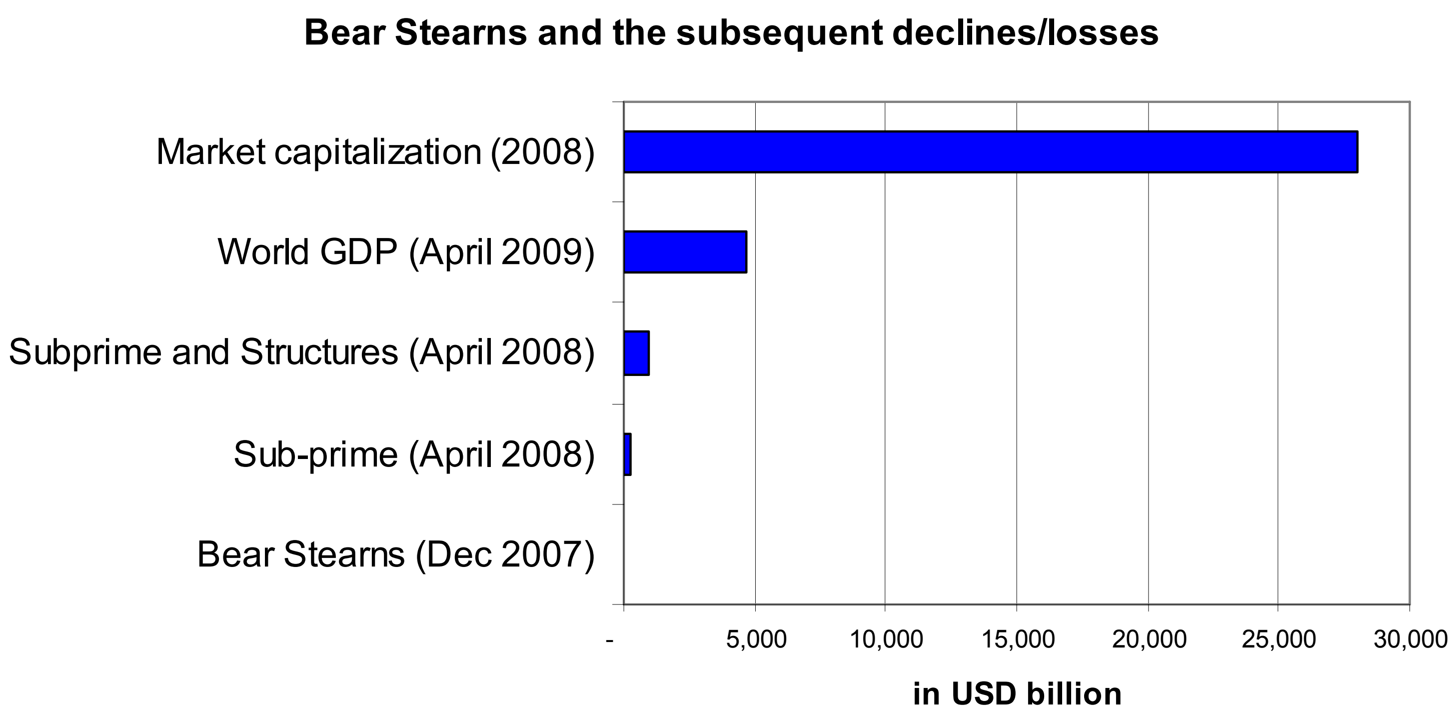
What has gone so bad so quickly?



The story of non-linearity !

Bear Stearns: Liquidity Myth and the Diffusion of Ownership

Chart 4: Liquidity may not always be found in markets

Bear Stearns	**Stylished Balances sheet**			
Assets in USD mil	May-08	Feb-08	Nov-07	Delta (Feb 08 to May 08)
Cash at hands	950	20,786	21,406	(19,836)
Receivavbles	26,046	53,332	53,522	(27,286)
Collateral received	200,700	303,000	280,000	(102,300)
Securities	(124,814)	12,407	30,407	(137,221)
others	55	9,470	10,027	(9,415)
Total	102,937	398,995	395,362	(296,058)

* Collateral received is fully activated; Securities is shown as resudual

Bear Stearns	Stylished Balances sheet			
Liabilities in USD mil	May-08	Feb-08	Nov-07	Delta (Feb 08 to May 08)
Short-term funding	17,848	8,538	11,643	$9,310
Payavbles	53,647	98,127	88,606	($44,480)
Collateral sold	26,015	204,578	208,680	($178,563)
Long Term Financing	3,410	71,753	68,538	($68,343)
others	132	4,103	6,102	($3,971)
Equity	1,884	11,896	11,793	
Total	102,936	398,995	395,362	($296,059)

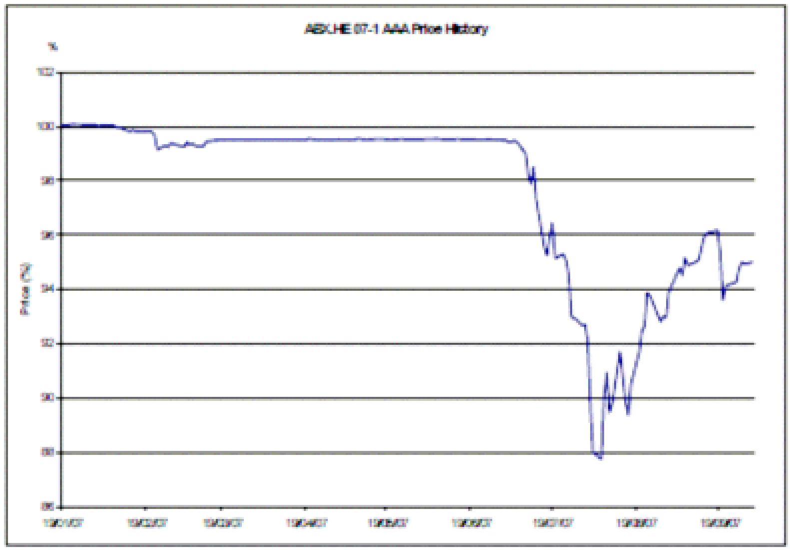
* Collateral sold is shown as residual

Bear Stearns was heavily reliant on selling collateral to meet its funding needs:

1. Ownership of securities provided as collateral has become diffuse
2. Financial markets have been assumed to be always there – The backdoor has been taken as principal entrance.

Structured finance: Markest are simply not efficient

Chart 5: Price movements of 2 identical ABX tranches with solely different ratings. What is wrong?



Markets provide more than one price per product – Prices are non-local.
Prices do not incorporate **all** available information.
Prices are guesswork (F. Hayek) and ignore more information (non-traded prices) as they incorporate.

Banking book and trading book regulation failed disastrously

Lehman reported an overall risk in compliance with modern banking regulation of $ 216 billion as of end-May 2008. Against this overall risk, the bank had Tier 1 Capital of $ 23 billion more **than twice the required 4%** or $ 8.5 billion. At this point in time, Lehman was seen as financially sound.

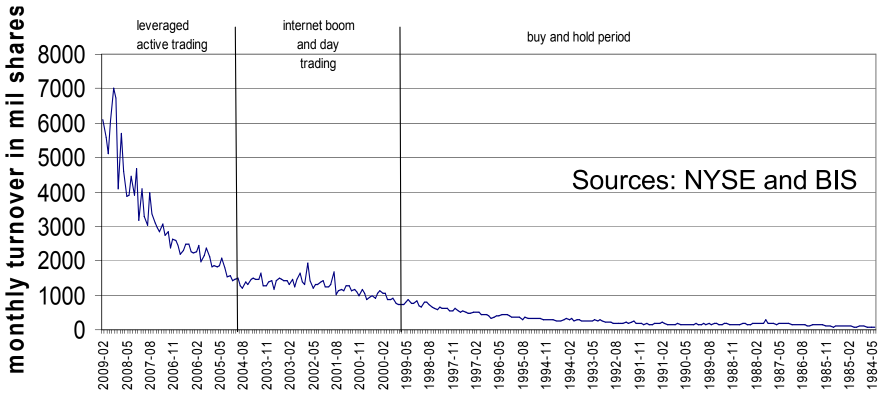
On February 29, 2008 Bear Stearns reported that would have required $ 0.55 billion net capital to comply with the regulatory capital adequacy rulings on its market, credit and operational risk. In the same moment Bear Stearns declared that its balance sheet has regulatory capital reserve of $ 2.89 billion. Hence, **Bear Stearns would have been still compliant with its regulatory regime if the company would have expanded its risk profile by the factor of 5.**

Obvious question: What is the value of a regulatory framework that does not hold for a period of a couple of months?
Change from capital adequacy framework to liquidity framework expected (Ratio of money at CB over money borrowed times 1/Maturity).

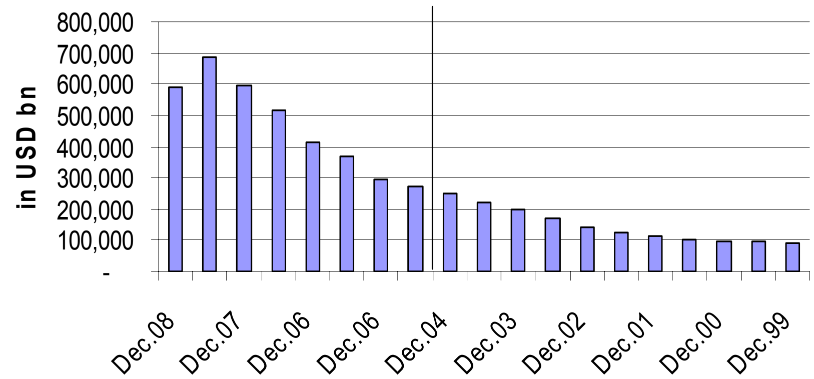
Money at central banks is becoming more important.

Back to the roots: Corporate banking instead of investment banking

Turnover at the NYSE and index points per mil of shares traded



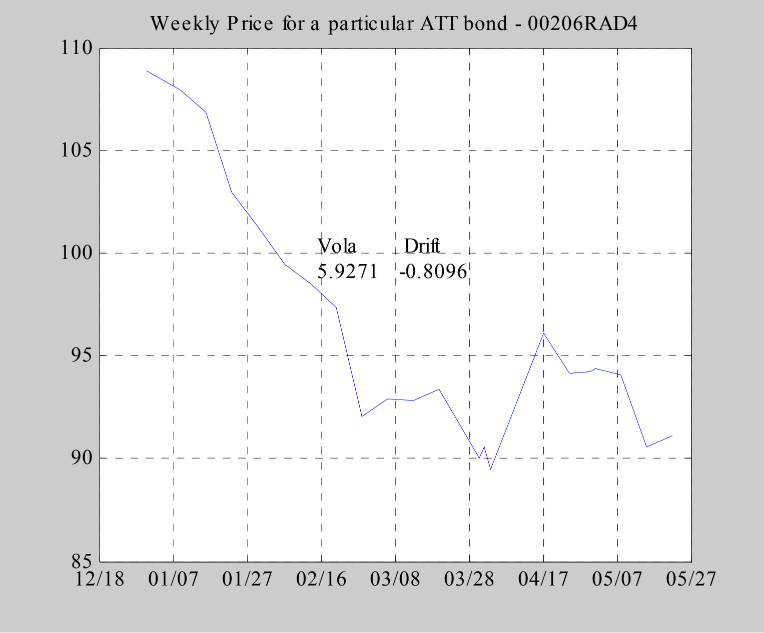
Nominal Value of OTC Derivatives

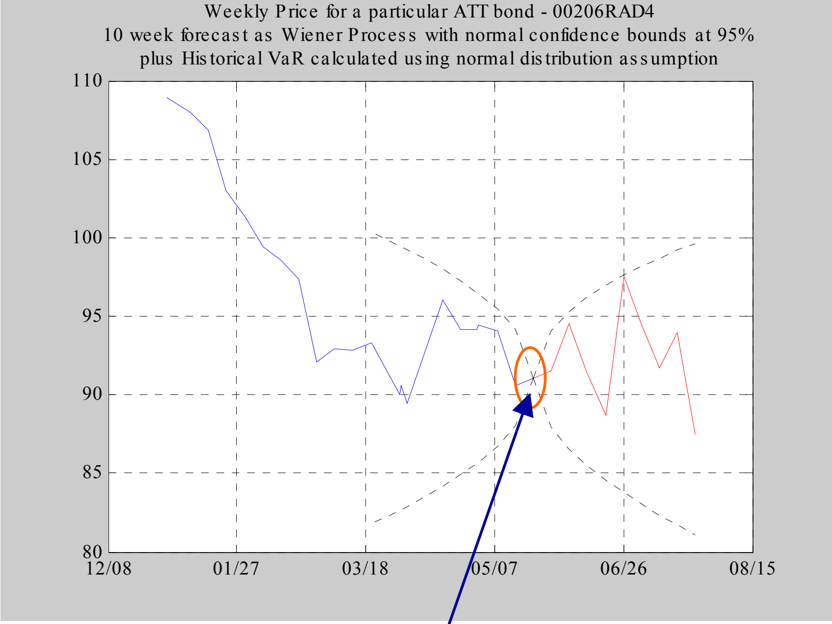


Shift in time horizon of holding securities can be expected.
Voice brokerage will be seen as value-add.
Notion of insurable risk in derivative markets will become dominant.

Appendix: A new look on market prices – Initial findings

The current paradigm: The current market price and its guidance over future and history

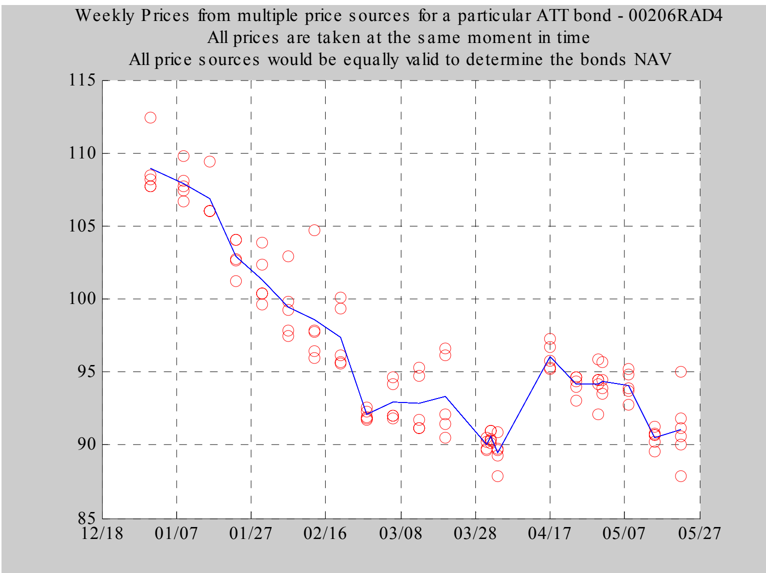


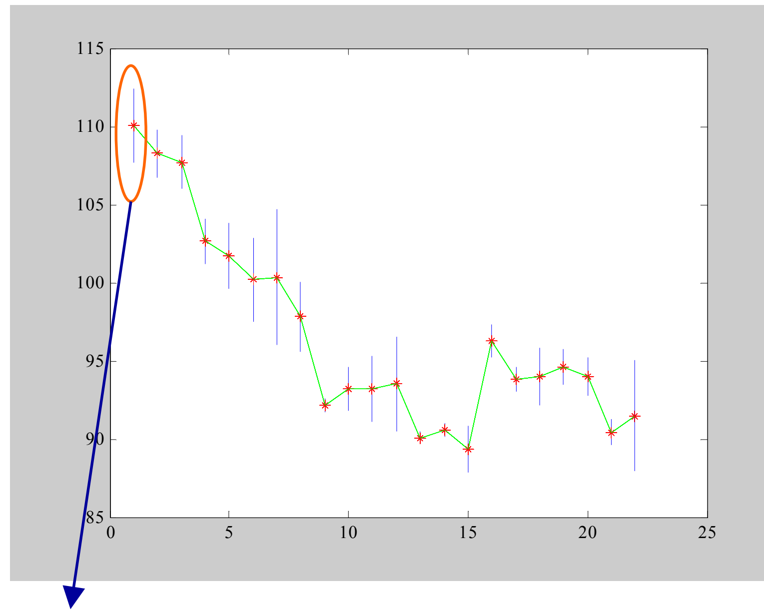


How can something without dimensions – a single point – become so powerful to provide the basis for historical VaR and future VaR estimations?

A more precise look at this security: Taking different pricing opinions serious

Look at multiple price sources for the same security





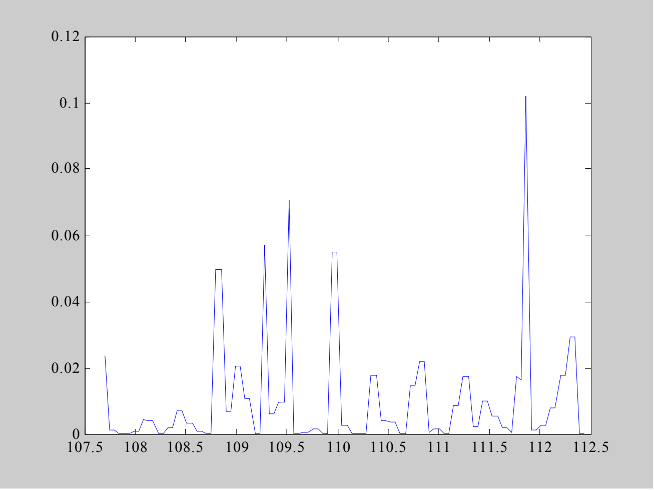
The dot becomes a one-dimensional string !!!
What can be known about the string???

On May 23, 2008, a different Evergreen fund bought a collateralized debt obligation backed by subprime mortgages for $9.50, down from an issued value of $100. As it happened, the Ultra Short fund owned that very security, and was valuing it at $98.93.

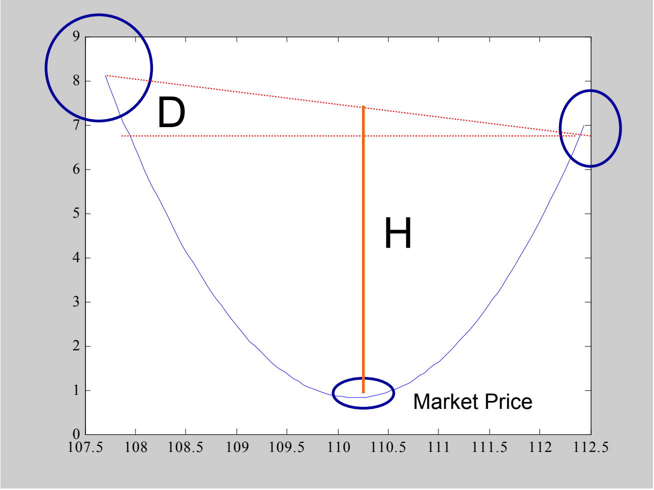
The string can be very long for some securities !!

A deeper look into the string:

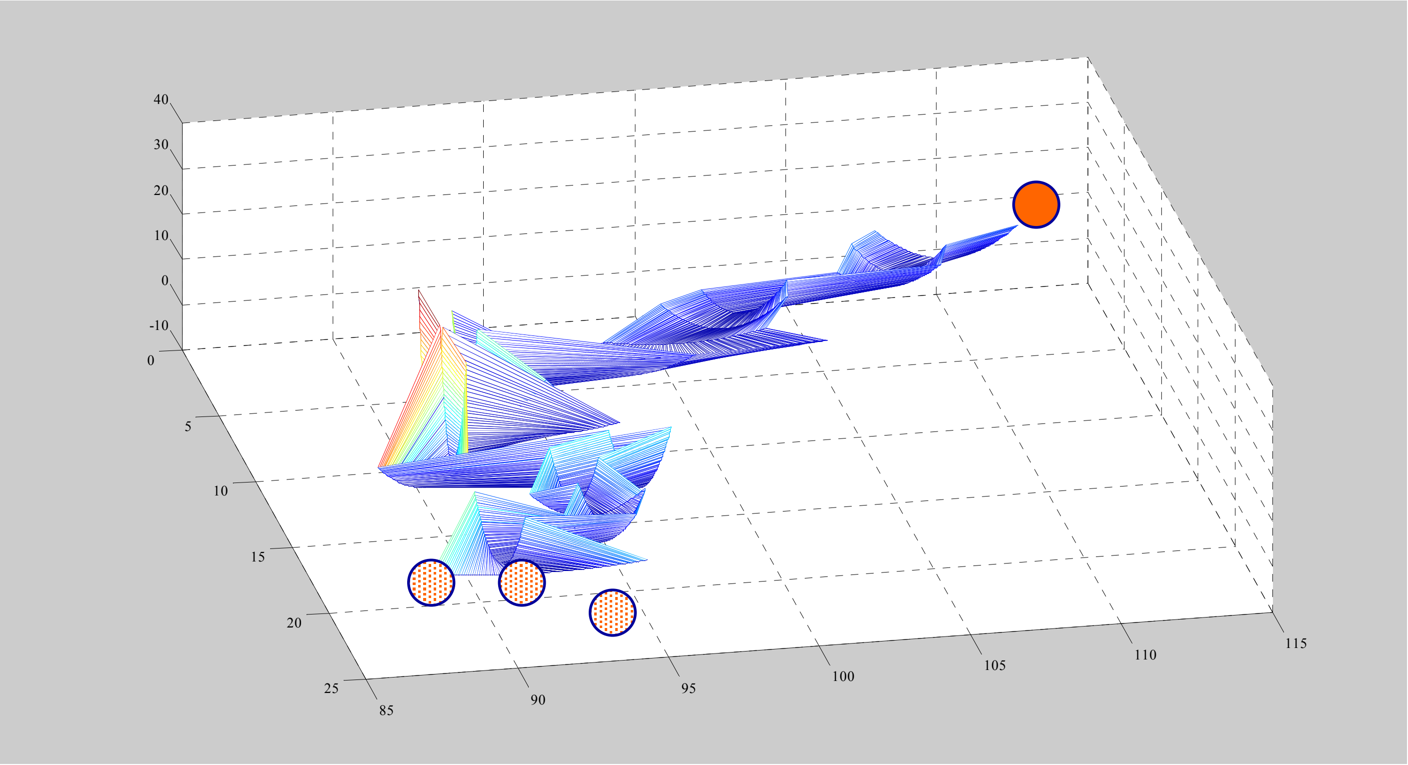
String as wave
is given by the time independent
Schroedinger equation:
$H*\Psi = E * \Psi$



After transforming the wave into uncertainty regions of a market price, the string takes an U-form



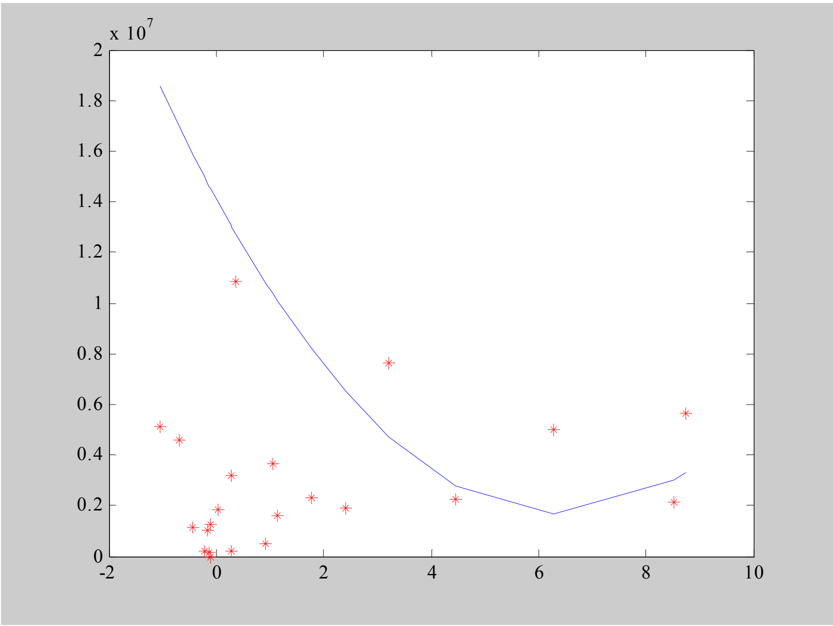
The pricing channel of a security: A Ball in this lane can take quiet different trajectories.



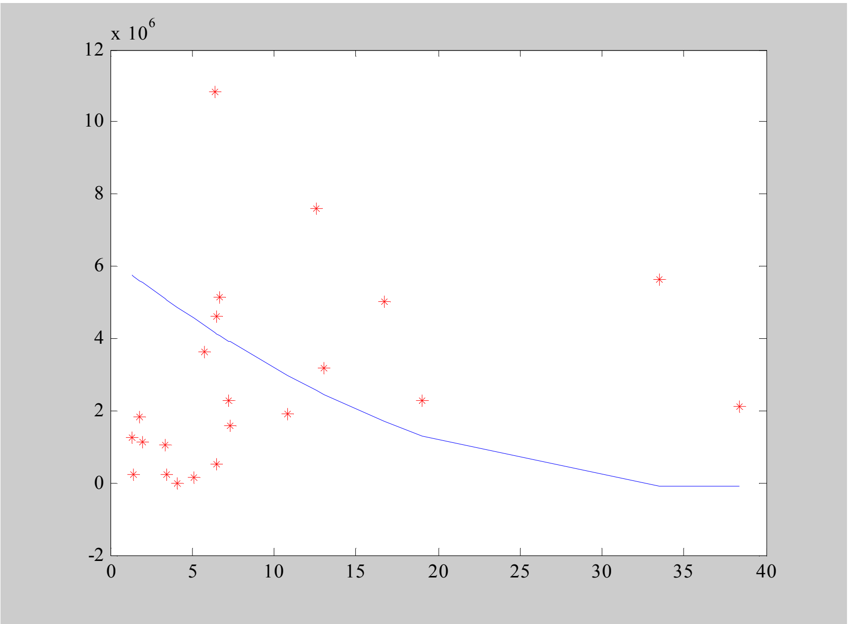
Prices are generated by an open and complex system that cannot described by mean variance:
Future Research on:
Complex price trajectories
Price interference
Relation between price and market webs

First empirical findings on the importance of D and H

Relationship between D and observed turnover volume



Relationship between H and observed turnover volume



Trading seems to take place if the difference in cash preferences is small (min (D)) and the U is relatively flat (min (H)).

CAUTION: Much more research required !!!!!