“Applying Behavioral Finance to Investing”

“Behavioral Finance: From theory to practice”

“U.S. Futures and European Stock Indexes: correlation and intra day anomalies ”

“Is the retail market efficient when dealing with Banking Bankruptcy? Not enough”

Behavioral Finance

• Behavioral finance is an alternative price-formation theory that attempts to explain market anomalies, which offer the potential for consistent, positive, risk-adjusted returns.

• Behavioral finance posits that psychology-related biases and tendencies cause investors to behave irrationally, which leads to the systematic mispricing of assets, which is maintained for a time by limits to arbitrage (See Shleifer and Summers, 1990; Ritter, 2003; and Hirshleifer, 2001).

Contribution of our Papers (1/3)

Behavioral Finance: From theory to practice

•How Behavioral Finance is “used” by AuM industry to beat the market

• Which are the main bias at the base of Behavioral Funds theory?

•Are Behavioral Funds able to outperform the market?

• The two main bias at the base of Behavioral Funds theory are overconfidence and anchoring.

•BFs use large earnings surprises as a primary catalyst and insider buying as main behavioral indicators,

•There is no clear evidence of overperformance of behavioral funds in the long term but positive performance in the short term (1 year)

• Clear capacity of the BFs to exploit known anomalies

Contribution of our Papers (2/3)

"U.S. Futures and European Stock Indexes: correlation and intra day anomalies"

- Futures contracts can provide a sentiment indicator to predict and adjust prices of stocks?
- Arbitrage opportunities on futures and stock markets are possible?
- Is the disclosing of information from U.S efficiently processed by European markets?

- We find confirmation of the well established strong correlation between futures (US) and stock indexes (EU) throughout the day, especially in the opening and closing of the European markets.
- Our novel result is that the correlation falls quickly in two precise moment of the day
- Our paper provides, at our knowledge, for the first time evidence on a different source of profitable arbitrage

Contribution of our Papers (3/3)

"Is the retail market efficient when dealing with Banking Bankruptcy? Not enough"

- The objective of our analysis was
- to check the ability of rating agency to signal US banking failure
- cognitive failure of retail customer to utilize this information

The analysis highlights as the rating agencies in the 2009 perceived and signaled to banking market the risk of U.S.A. banks and the probability of their bankruptcy.

Customer deposits did not react promptly to rating changes and the signals provided by the rating agency.

Overconfidence, lack of belief perseverance and probably unperfected information flows, brings retail clients to underreact to an important piece of information

Behavioral Finance: From theory to practice

Behavioral Bias (1/2)

- Analyst and Investors (A&I) are slow to recognize new information related to earnings surprises;
- A&I behave overconfidently to their prior view;
- A&I underweight evidence that disconfirms their prior views and overweight confirming evidence;
- A&I tend to interpret a permanent change as a temporary one.

Behavioral Bias (2/2)

- The two main bias at the base of Behavioral Funds theory are overconfidence and anchoring.

- BF explains that by buying a stock soon after a major positive earnings surprise could pay back in a significant way.

Literature on Behavioral Funds Performance

•"Behavioral Portfolios: Performance Measurement" by Reinhart and Brennan (2003)

•In "Behavioral Finance: Are the Disciples Profiting from the Doctrine?" (2006) Colbrin Wright, Vaneesha Boney, Prithviraj Banerjee analyzed 16 behavioral funds to determine whether they successfully attract investment dollars and earn abnormal returns.

Funds analyzed

	Reinhart	Wright	Santoni	Fund name
1	KDHAX	KDHAX	KDHAX	DWS STRATEGIC VALUE FUND-A
2	KDSAX	KDSAX	KDSAX	DWS DREMAN S/C VALUE FND-A
3	LSVEX	LSVEX	LSVEX	LSV VALUE EQUITY FUND
4	JPIVX	JPIVX	JPIVX	JPMORGAN INTREPID VALUE-SEL
5	JPIAX	JPIAX	JPIAX	JPMORGAN INTREPID AMERICA-S
6	JPGSX	JPGSX	JPGSX	JPMORGAN INTREPID GROWTH-SE
7	JIISX	JIISX	JIISX	JPMORGAN INTREPID MULTI C-SE
8	UBRLX	UBRLX	UBRLX	UNDISCOVERED MGRS BEHV GR-IN
9	UBVLX	UBVLX	UBVLX	UNDISCOVERED MGRS BEHV VL-IN
10		LOPEX	LOPEX	DWS DREMAN CONCENT VALUE-A
11		WOOPX	WOOPX	JPMORGAN INTREPID M/C-SEL
12		LMVTX	LMVTX	LEGG MASON VALUE TRUST-C
13		NLCIX	NLCIX	NICHOLAS APP US SYS L/C G-I
14		SSLAX	SSLAX	SUNAMERICA FOCUSED L/C VAL-A
15		KDFAX	UBGAX	UNDISCOVERED MGRS BEHV GR-A
16		NASSX	LSVPX	LSV CONSERATIVE CORE EQUITY
17			LSVVX	LSV CONSERVATIVE VALUE EQUIT
18			OSI9180	DEGROOF-EQ EMU BEHAV VL-BENA
19			DEGEMUA	DEGROOF-EQ EMU BEHAVIOR FL-A
20			DEEMUBV	DEGROOF DBI-RDT- EMU BEHAV-D
21			DEGEUFA	DEGROOF-EQ EUR BEHAV FLEX-A
22			DEGSUSA	DEGROOF-EQ EUR BEHAV SUST-A
23			DEGUSBA	DEGROOF-EQ US BEHAV FLEX-A
24			JCJBFAA	JPM CORE JAPAN BEH FIN A ACC
25			JPMJBAA	JPM INV-JAP BEHAVIOR F E-A€A
26			ESPRITE	DEGROOF EQ EUROPE BEHAV VL-B
27			ESPESCA	DEGROOF EQ SM CP EURP BV-BC
28			OSIBEPR	DEGROOF-EQUITIES EMU BEHV-A
29			OSEUSBV	DEGROOF-EQUITIES US-BENELX A
30			LGTEQGS	LGT EQ FD GL SEC TRND USD-B
31			HIEZX	VIRTUS VALUE EQUITY FUND

Major topics analyzed

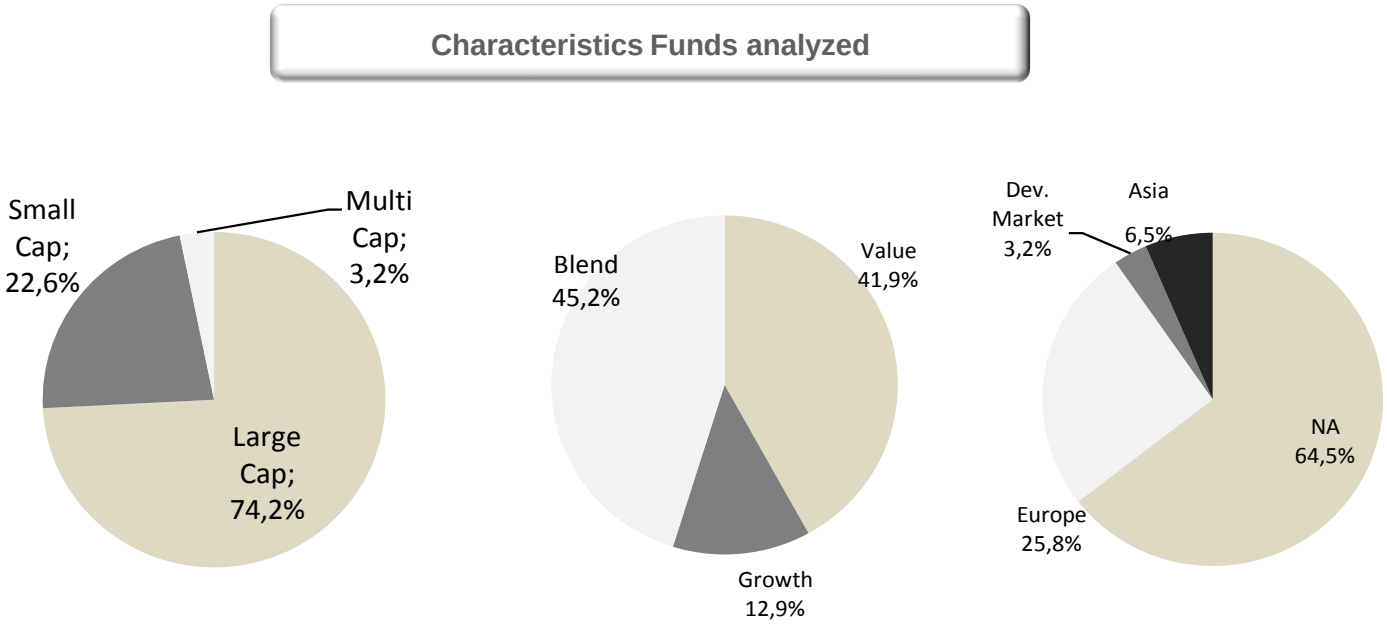
	Reinhart	Wright	Santoni
Capacity to attract money inflow		√	
Capacity to ourperform peers and benchmark	√	√	√
Risk adjusted analysis	√	√	
Style analysis	√		√
Seasonality effect			√
Bull vs Bear markets			√
Diversification			√
Consistency			√
Anticipate reversal			√

Behavioral Funds Analyzed

• In our research we considered **31 funds** that claims to apply behavioral finance in their portfolio strategy with total cumulative **asset under management of $16 billion.**

• In particular these funds are part of the Fuller & Thaler funds family, the JPMorgan AM funds, the Bank Degroff funds, LVS funds, Osiris funds, LGT funds.

• We analyzed their performance **from inception to 18th August 2009**.



Strategy adopted

•They seeks in particular to exploit the **winner-loser effect** (Behavioral Value Fund) and **post earnings announcement drift** (Behavioral Growth Fund). In particular they use large earnings surprises as a primary catalyst. The second stage of the strategy is to attempt to identify whether large earnings surprises are driven by company-specific factors.

• Another interesting characteristics of the F&T portfolio strategy is that they **do not use any target price to identify a potential exit point while they adopt a stop loss mechanism**. The idea behind this strategy is to avoid the prospect theory trap where basically investors tend to sell too early on the upside while they sell too late on the downside.

• JPMorgan Behavioral Funds identified also **insider buying** as main behavioral indicators.

•LSV AM managed by Lakonishok and two others academics specialized in behavioral finance as Andrei Shleifer of Harvard and Robert Vishny of the University of Chicago highlighted that at the heart of their strategy there is a simple receipt: *"We search for **companies that have had poor performance and have disappointed investors in the past**"*

Main Findings (1/3)

- There is **no clear evidence of overperformance of behavioral funds** versus the relative indexes. Over a long period. On the 5 year performance only 47% of the funds beat the benchmark. On a shorter horizon (1 year) the funds improved their performances versus the benchmark with 57% of them managing to beat it.

- As regarding volatility, 60% of the funds analyzed reported a **lower volatility** versus the relative benchmark as we would expect from a behavioral funds of which majority are invested in value/blend stocks.

- We found a **very interesting seasonality effect** on the funds performances. The first finding was that, in the past 5 years, in 88% of the case the average cumulative performances of behavioral funds in the month of May tend to outperform its benchmark and it happens the same for 76% of the cases during the month of December and 56% in January. On the opposite side August and October are the three worst months with only 32% and 28% respectively average outperformance. It is interesting to note that in 8 months out of 12 on average behavioral funds tend to underperform its benchmark.

Main Findings (2/3)

• We analyzed the performance of the funds during bear and bull cycles in the past 20 years. We analyzed three negative cycles in the past 20 years. August 1998, with the Dow Jones collapsing 15%, the period April 2002 till October 2002 (-27%) and finally the period August 2007 till March 2009 (-47%). We found out that on average the **behavioral funds are not particularly good in beating the market during "bear" market period** and in two cases of three the performance was poor.

• We analyzed also the performance during bull market periods. The first period analyzed goes from September 1998 to May 2001 when the Dow Jones Industrial index increased by 44%, then February 2003 to July 2007 (+69%) and February 2009 to August 2009 (+29%). **In periods of "bull" markets we found out that behavioral funds tend to do better** than bear markets with behavioral fund managing to beat the benchmark in majority of the cases.

Main Findings (3/3)

• In order to check the last hypothesis of the previous point 8) we verified of the **consistency of performance of specific funds** versus the benchmark in the three bull market period. We found **very limited correlation** with only 1 funds able to outperform in all the three period and 30% able to outperform in two out of three period. This means that one of the possible explanation of the negative performance due to the entrance of non expect is not plausible.

• Another aspect we analyzed was the capacity of the behavioral funds to predict reversal in the 6 cycles analyzed during the past 20 years . In our study we concentrated on a short period (2 months after a bear/bull trend start) trying to verify the ability of the behavioral funds to anticipate the reversal of the trend. We found out that behavioral funds have the capacity in the first two months of bear market (in 2002 and 2007) to behave better than during the entire bear market considered. An interesting aspect is that exactly the opposite happens during periods of bull market when behavioral funds needs more time to capture the reversal. Overall we would say that the **capacity of behavioral funds to anticipate reversal is difficult to support.**

"U.S. Futures and European Stock Indexes: correlation and intra day anomalies"

Future vs Index

•The relationship between the price series of futures and stock markets is one of the most widely researched topics in finance. The reason is that **futures contracts can provide a sentiment indicator to predict and adjust prices of stocks.**

• There is evidence in literature that price dynamics is such that **arbitrage opportunities on futures and stock markets are uncommon**. However, there is also wide consensus that the **realignment of prices** in the two **markets is not instantaneous** and that stock indexes follows the corresponding future indexes with a time lag ranging from five minutes (Stool-Whaley 1990) to forty-five minutes (Kawaller et al. 1987).

•The growth of online trading and the globalization of financial markets should most probably shorten this lag. These factors also accelerate the integration between US and European financial markets. The continuous release of information and the nonstop trading activity are two powerful forces leading in this direction.

Contribution of the paper

The aim of this paper is to provide

- evidence on the relationship between the price dynamics of the US futures contracts index and of three major European stock indexes
- to investigate if there is growing interdependence between U.S. and European financial markets
- and if these markets are efficient enough to ensure that all the opportunities for profitable arbitrage are removed.

Cognitive Heuristic (1/2)

- Professional financial traders are overwhelmed with information and extracting relevant information is a long and hard task, while trading decisions require immediate actions.

- Professional traders, who have acquired expertise in their activity, integrate information and make critical decisions by instinct, which is a highly automatized skill. Their brain integrates unconsciously a huge amount of information from the stock market and from external sources, especially when they operates at a time frame that is intraday.

- Cognitive psychology defines these mechanisms, which are not filtered by awareness or deliberate thinking, as **cognitive heuristics.**

Cognitive Heuristic (2/2)

- Overconfidence is considered a key personality trait of financial traders. DeBondt and Thaler (1995) argue that "perhaps the most robust finding in the psychology of judgment is that people are overconfident".

- In terms of information collecting, overconfident subjects do not process exhaustively all the available information but use rules of thumb to determine which pieces of information deserve to be processed.

The data

• Our statistical analysis used intraday, minute by minute, prices of S&P 500 nearest futures (SPH0) and of CAC, DAX and FTSE indexes. Data are referring to two periods: from February 1, 2010 to March 11, 2010 (i.e. 30 trading days) and from March 29, 2010 to April 30, 2010 (i.e. 25 trading days).

• The S&P 500 index Futures is one of the most widely traded index futures contracts in the United States.

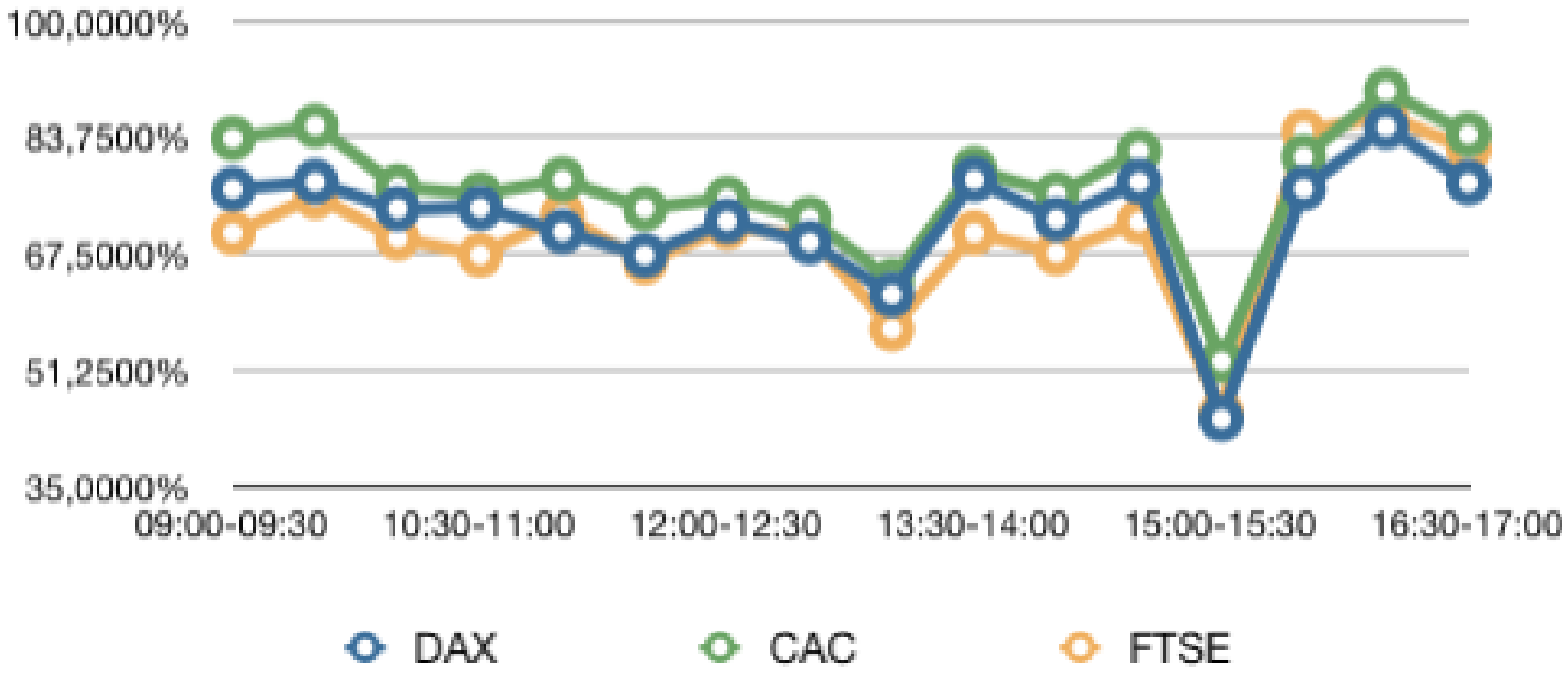
•The CAC 40 is a market value-weighted index, which represents a capitalization-weighted measure of the forty most significant values among the one hundred highest market caps on the Paris Bourse (now Euronext Paris).

• The DAX, with a market capitalization of 656 billion euro, is a blue chip stock market index consisting of the thirty major German companies trading on the Frankfurt Stock Exchange.

•The FTSE 100 Index — also called FTSE 100, FTSE, or, informally, the "footsie"— is a share index of the one hundred most highly capitalized UK companies listed on the London Stock Exchange.

Results (1/3)

Correlation between S&P futures and DAX, CAC, FTSE stock indexes from January to May 2010 (30 minutes)



Results (2/3)

Correlation between S&P futures and DAX, CAC, FTSE stock indexes from January to May 2010 (30 minutes)

Time Period (CET time)	DAX	CAC	FTSE
09:00-09:30	76.68%	83.66%	70.49%
09:30-10:00	77.67%	85.42%	75.62%
10:00-10:30	73.91%	76.99%	69.76%
10:30-11:00	74.01%	75.94%	67.38%
11:00-11:30	70.69%	77.99%	73.02%
11:30-12:00	67.34%	73.95%	66.38%
12:00-12:30	72.19%	75.39%	71.27%
12:30-13:00	69.17%	72.56%	70.17%
13:00-13:30	**61.88%**	**63.79%**	**57.11%**
13:30-14:00	78%	79.42%	70.52%
14:00-14:30	72.43%	75.98%	67.67%
14:30-15:00	77.69%	81.82%	72.08%
15:00-15:30	**44.41%**	**52.54%**	**45.23%**
15:30-16:00	76.75%	81.07%	84.59%
16:00-16:30	85.25%	90.36%	86.9%
16:30-17:00	77.54%	84.2%	82.06%

Results (3/3)

Average Volumes for S&P futures

Time Period (CET time)	Volumes (Average Values)
09:00-09:30	71.43
09:30-10:00	57.23
10:00-10:30	49.27
10:30-11:00	54.30
11:00-11:30	43.43
11:30-12:00	51.73
12:00-12:30	**28.77**
12:30-13:00	**39.80**
13:00-13:30	**38.70**
13:30-14:00	50.97
14:00-14:30	110.00
14:30-15:00	86.43

Main Findings (1/2)

- There is a strong correlation between futures and indexes throughout the day, especially in the opening and closing of the EU markets. CAC index is the most strongly correlated with the futures, and then we have DAX and FTSE.
- There is a correlation fall between 13:00 and 13:30 and another remarkable fall between 15:00 and 15:30.
- The strength of futures-indexes correlation decreases and weakens in 10 minutes.

Main Findings (2/2)

- We find confirmation of the well established strong correlation between futures and stock indexes throughout the day, especially in the opening and closing of the European markets.
- Our novel result is that the correlation falls quickly and remarkably between 13:00 and 13:30 and between 15:00 and 15:30 (CET), while it reaches its peak between 16:00 and 16:30. The first fall is interpreted as derived from the pre-release of news coming from U.S. The second fall is interpreted as due to the timing hole in the S&P 500 future contracts trading platform.
- Both findings indicate that the disclosing of information from U.S. is not efficiently processed by European markets.

"Is the retail market efficient when dealing with Banking Bankruptcy? Not enough"

Customer behavior and rating agency (1/2)

- The objective of our analysis was 1) to check the ability of rating agency to signal US banking failure 2) cognitive failure of retail customer to utilize this information

- We checked the time of the first downgrade to E (lowest rating) of the 116 Banks failed in USA in 2009. The analysis is made on a quarters and on a full year.

- Our study shows that above 40% of U.S.A. banks failed in the 2009 downgraded to E in the fifth/sixth quarter prior to failure.

- 91% of USA banks failed were downgraded to E in the quarter prior to failure.

Customer behavior and rating agency (2/2)

- The analysis highlights as the rating agencies in the 2009 perceived and signaled to banking market the risk of U.S.A. banks and the probability of their bankruptcy.

- Customer deposits did not react promptly to rating changes and the signals provided by the rating agency.

- Loan/deposits from customers were on average 95% that is in line with the USA banking system overall

Rating agencies

Ratings

Rating	Description
A+ and A	An institution that has an exceptional financial condition, little or no nonperforming assets, and is highly capitalized with strong earnings. These grades represent the highest level of financial soundness.
B+	An institution with an overall strong financial condition, but not as strong as A+ and A rated companies. The company is most likely to meet its credit obligations under severe economic, financial and business conditions.
B	An institution with an adequate financial condition that is likely to meet its credit obligations under severe economic, financial and business conditions.
B- and C+	An institution with an adequate financial condition but is more susceptible to adverse changes in economic conditions that could affect its ability to meet its credit obligations. Lowest investment grade rating.
C and C-	An institution whose financial condition is judged to be relatively weak and its ability to meet financial obligations could be affected by adverse economic, financial or business conditions. Non-investment grade.
D and E	Institutions are likely to have financial problems (poor LACE Financial ratios). Careful consideration should be made about investments in these institutions. These institutions are likely to have a higher probability of failure than institutions with higher ratings. LACE Financial recommends that all credits on D and E rated institutions be secured. Non-investment grade.

Our analysis contextualizes the role of the rating agencies in the U.S.A. bank failures in the 2009 (116 on total of 199). Data was obtain from the database of the U.S.A. rating agency LACE Financial Corporation. The rating scale uses by LACE is represented in the table 1.

Banks rating evolution (1/2)

Ratings of banks that failed in the USA in 2009

% rated Banks

Scale	4Q05	4Q06	4Q07	1Q08	2Q08	3Q08	4Q08	1Q09	2Q09
A	29,0%	35,9%	8,1%	0,0%	2,7%	0,0%	0,0%	0,0%	0,0%
B+	32,3%	17,5%	8,1%	2,6%	2,7%	0,9%	0,0%	0,0%	0,0%
B	29,0%	17,5%	13,5%	2,6%	2,7%	0,0%	0,0%	0,0%	0,0%
B-	6,5%	9,7%	10,8%	9,2%	8,1%	4,4%	2,0%	0,0%	0,0%
C+	0,0%	3,9%	9,0%	9,2%	7,2%	3,5%	0,0%	1,2%	0,0%
C	3,2%	5,8%	5,4%	6,6%	2,7%	2,6%	2,0%	0,0%	2,1%
C-	0,0%	4,9%	9,9%	10,5%	7,2%	6,1%	2,0%	3,5%	2,1%
D	0,0%	1,9%	4,5%	2,6%	5,4%	6,1%	5,9%	1,2%	0,0%
E	0,0%	2,9%	30,6%	56,6%	59,5%	76,3%	88,1%	93,0%	93,6%

:= Investment Grade

:= Lowest Investment Grade

93% of the USA Banks failed in 2009 were rated “E” already in 2Q09 showing good capacity to predict banks failure from rating agency

Souce: FDIC (3)

Banks rating evolution (2/2)

Ratings of banks that failed in the USA in 2009-in first ten days of June 2010

	LACE RATING		FREQUENCY	
Rating	Prior Qrt	Failed Qrt	Prior Qrt	Failed Qrt
A	0	0	0,0%	0,0%
B+	2	1	1,0%	0,5%
B	1	0	0,5%	0,0%
B-	1	1	0,5%	0,5%
C+	2	0	1,0%	0,0%
C	1	1	0,5%	0,5%
C-	6	2	3,0%	1,0%
D	2	0	1,0%	0,0%
E	181	191	91,0%	96,0%

91% of the USA Banks failed between 2009 and first semester 2010 were rated “E” the previous quarter of the failure showing good capacity to predict banks failure from rating agency

Souce: FDIC (3)

Banks in USA failed for NPA

Characteristics of banks that failed in the USA in 2009-in first ten days of June 2010

NPA's/Asset %		**14.34%**
Leverage Capital/Assets %		**3.15%**
Total Cap/Assets %		**4.24%**
Tier 1/Asset		**3.08%**
ROA %		**-6.81%**
Total Assets ($mln) medio		**878.85**
TOTAL LOANS ($mln)		**590.79**
TOTAL DEPOSITS ($mln)		**714.87**
Customers		**656.36**
Others		**60.53**
LOANS/DEPOSITS		**80.95%**
LOANS/DEPOSITS customers		**95.43%**
LOANS/ASSETS		**71.43%**

Souce: FDIC (3)

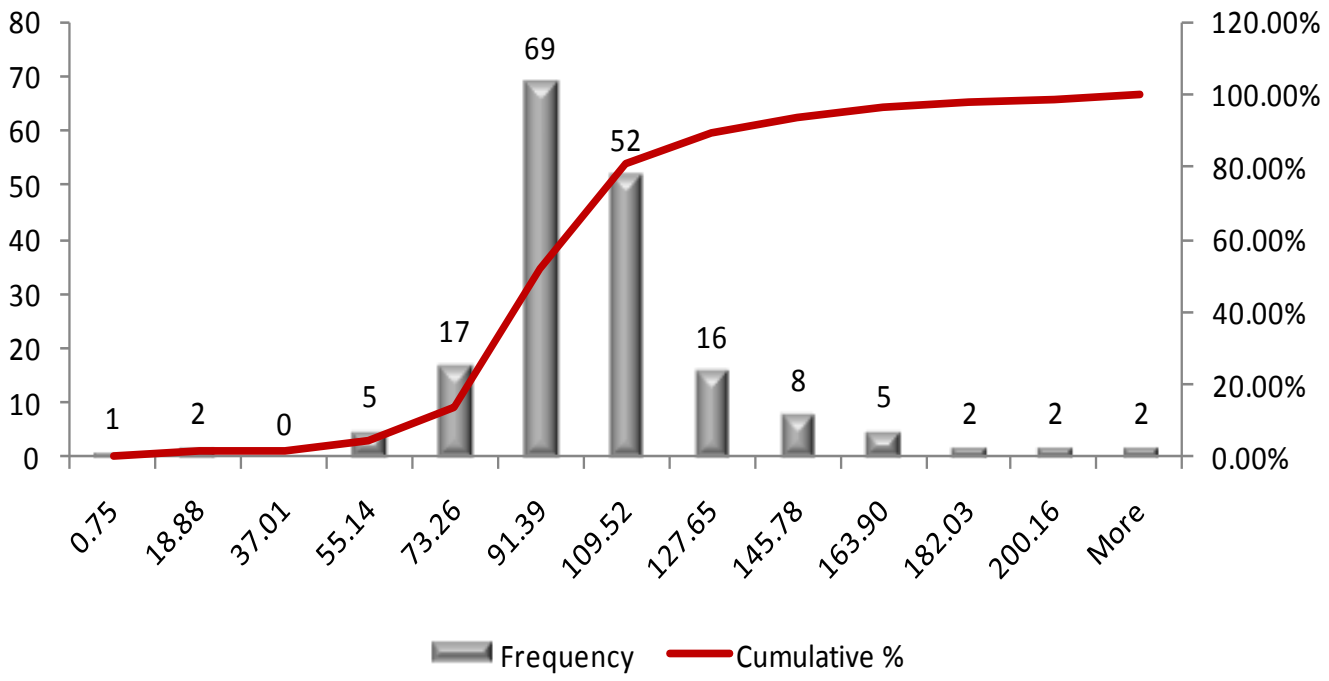
The major reason for the USA banking failure were the high Non performing asset formation that reached on average 14% the quarter prior of the failure.

Customer deposits

Change %, Frequency and Cumulative % of Loans/Deposits Customers

Loans/Deposits Customers (%)	
Mean	95.43
Standard Error	2.32
Median	90.90
Standard Deviation	31.17
Sample Variance	971.84
Kurtosis	5.34
Skewness	1.20
Range	235.66
Minimum	0.75
Maximum	236.41
Sum	17272.86
Confidence Level(95.0%)	4.57

Souce: FDIC (3)



Customer deposits did not react to rating changes and the signals provided by the rating agency.

Loan/deposits from customers were on average 95% that is perfectly in line with the USA banking system overall.

Customer deposits behavior (some examples)

Freedom Bank of Georgia	*fallimento 1Q09 / 1°downgrade E 4Q07*						
	4Q07	1Q08	2Q08	3Q08	4Q08		%
Total Assets ($mln)	147,11	151,92	151,04	147,25	172,45		17,22%
TOTAL LOANS ($mln)	118,29	117,93	114,05	111,31	106,21		-10,21%
TOTAL DEPOSITS ($mln)	115,78	121,77	122,39	121,66	159,05		37,37%
Customers	81,67	86,14	86,62	89,49	112,02		37,16%
Others	34,11	35,63	35,77	32,17	47,03		37,85%

Omni National Bank	*fallimento 1Q09 / 1°downgrade E 4Q07*						
	4Q07	1Q08	2Q08	3Q08	4Q08		%
Total Assets ($mln)	906,57	984,35	1.025,94	1.033,58	979,59		8,05%
TOTAL LOANS ($mln)	644,00	654,10	654,05	635,29	573,10		-11,01%
TOTAL DEPOSITS ($mln)	725,74	796,52	846,84	865,38	813,21		12,05%
Customers	638,10	744,06	778,61	805,91	701,72		9,97%
Others	87,64	52,46	68,23	59,47	111,48		27,20%

American Southern Bank	*fallimento 2Q09 / 1°downgrade E 3Q08*						
	4Q07	1Q08	2Q08	3Q08	4Q08	1Q09	%
Total Assets ($mln)				100,43	110,07	105,95	5,50%
TOTAL LOANS ($mln)				66,38	64,70	62,86	-5,30%
TOTAL DEPOSITS ($mln)				90,20	102,12	105,94	17,45%
Customers				75,43	87,48	90,13	19,49%
Others				14,77	14,65	15,81	7,04%

Customer behavior and rating agency

Which mechanism does not work in the relationship between customer behaviour and rating agency?

- Belief perseverance: does not work because ratings was not considered a belief from retail customers

- Confirmation bias: does not work because ratings does not appear to have informative power. The typical use of ratings as a cutting edge information, a way to process news, was undermined.