Behavioral Bias of the Financial Crisis

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Financial institutions suffered large losses following the collapse of the credit markets despite making huge risk management investments. Major risks are frequently ignored due to behavioral biases resulting in incorrect decisions. These biases are reinforced by organizational obstacles, such as misaligned compensation systems. This article outlines a supplemental behavioral risk framework, and applies it to the structured finance market. Behavioral finance can improve how risk decisions are made. You ignore behavioral risk at your peril.

Major strides were made in quantitative risk management during the 1990s. Yet despite these advances, financial institutions suffered large losses following the collapse of the subprime and structured products markets. How this could have occurred given sophisticated tools and massive risk system investments is a concern. A further concern is the likelihood of repeating this experience during the next cycle. Although we know how risk decisions should be made, less is known on how these decisions are actually made.

Risk management should encourage profitable risk taking while discouraging unprofitable and catastrophic risk. In most institutions, however, political power and capital flows to successful individuals. Unfortunately, it is difficult to determine whether they are truly successful or just lucky. Our existing risk measures account for perhaps 95% of what occurs. The major catastrophic risks lurk in the fat tails of the remaining 5%. We tend to underestimate these improbable risks due to behavioral biases.

Institutions and regulators are changing their risk systems and personnel to address this issue. The problem, however, is not only with the systems or the quality of the personnel but within the individuals themselves. Most individuals have a model of how the world works. When challenged by events, we try to explain away the events. Behavioral economics provides insight into risk-assessment errors and possible remedies.

This article outlines a behavioral risk framework to address judgment bias and develop appropriate responses. Behavioral finance recognizes that decision processes influence perception and shape our behavior. The framework supplements current quantitative risk management by improving responses to risk changes over time. The framework will then be applied to the structured finance crisis.

I. Behavioral Finance Framework

Risk can be classified along two dimensions. The first concerns high-frequency events with relatively clear cause-effect relationships. Other risks occur infrequently. Consequently, the cause-effect relationship is unclear. The second dimension is impact severity. No matter how remote, high-impact events cannot be ignored because they can threaten an institution’s existence as was demonstrated in the current market crisis. The dimensions are reflected in the risk map in Figure 1.

Quadrant A events include retail credit products including credit cards. Many small defaults are expected. Screening helps identify groups with higher default probabilities. These groups are charged higher rates to offset the risk. Quadrant B represents many internal operational risks such as check processing errors. The costs are absorbed and the focus is...
on mitigation and prevention through improved processing and training.

Type C events include concentrated exposures to high risk borrowers. These well known risks are managed by constant management monitoring and control. Type D events are frequently ignored due to a low frequency. Examples include many of the structured finance products which represented short positions in an option. They offered long period of steady income punctuated with occasional large losses.

Cyclical risks are low-frequency-high-impact events characterized by their negative skew and “fat-tailed” loss distributions. Investors incurring such risk can expect mainly small positive events but are subject to a few cases of extreme loss. These risks are difficult to understand. The difficulty stems from two factors. First, there is insufficient data to determine meaningful probability distributions. In this case, the statistics are descriptive, not predictive. Consequently, no amount of mathematics can tease out certainty from uncertainty.1 Second, and perhaps more important, infrequency clouds hazard perception. Risk estimates become anchored on recent events. Overemphasis on recent events can also produce disaster myopia during a bull market, as instruments are priced without regard to the possibility of a crash. These facts lead to risk mispricing and the procyclical nature of risk appetite.

Quantitative risk-management models are based on portfolio and option pricing theory and provide a framework on how risk managers should act. These models build on expected utility theory (EUT), which views individuals as expected utility maximizers.2 Empirical support of EUT is mixed with numerous reported anomalies.3 Examples of anomalies include holding losers, selling winners, excess trading, and herding.

An alternative, prospect theory,4 can explain these facts. Instead of being expected utility (E(U)) maximizers, investors are viewed as expected regret (E(r)) minimizers focusing more on losses than gains. This is reflected in Figure 2.

EUT focuses on wealth changes. The value function in prospect theory is based on gains or losses relative to a reference point, usually par or the original purchase price.

Behavioral finance examines how risk managers gather, interpret, and process information. Specifically, it concentrates on perception and cognitive bias. It recognizes models can influence behavior and shape decisions. These biases can corrupt the decision process, leading to suboptimal results as emotions override self-control.

Market signals are complex. They include both information and noise. Information concerns facts affecting fundamental values. Noise is a random blip erroneously interpreted as a signal.5 Risk managers have developed shortcuts, rules of thumb, or heuristics to process market signals. These belief-based heuristics incorporate biases or cognitive constraints, which will now be investigated.

A. Regret

Risk is forward looking. Regret, however, is backward looking. It focuses on responsibility for what we could have done but did not do. Regret underlies several biases. We try to minimize regret by seeking confirming data, suppressing disconfirming information, and taking comfort that others made the same decision. Consequently, regret can inhibit learning from past experiences.

Sunk costs are the first regret bias considered. Sunk-cost bias involves avoiding recognizing a loss despite evidence the loss has already occurred and a further loss is likely.


4 A. Tversky and D. Kahneman, 1992, “Advances in Prospect Theory: Cumulative Representation of Uncertainty,” Journal of Risk and Uncertainty, which builds on their earlier work. Prospect theory is a key component of Behavioral Economics. Behavioral finance is a subset of Behavioral Economics, applying its concepts to asset pricing. This article uses the terms interchangeably.

Examples include the reluctance to sell impaired assets at reduced prices. Usually this is defended as the market prices being too low. Most institutions, however, reject the logical alternative of acquiring additional exposure at the market price to exploit the alleged under-pricing; thus, illustrating in this instance, price is of secondary importance relative to regret.

Panic conditions are also based on a combination of regret and herding. In a crisis, the reference is pessimism, and we actively seek bad news to confirm our belief. Thus, to minimize regret, we follow the herd not to be left behind and engage in panic selling. This further depresses prices leading to continued forced selling and the creation of a negative feedback loop as occurred in the fourth quarter 2008.

Another regret-related bias is the house money effect. Risk managers will assume greater risks when they are up in a bull market and lower risk in a bear market. Regret is perceived to be less when risk of winnings is involved, than risk of initial capital. This procyclical phenomenon leads to “buy high and sell low” behavior, reflected in Figure 3.

This illustrates the George Soros reflexivity or feedback principle, whereby markets affect psychology and psychology affects markets. Positive feedback is self-amplifying, while negative feedback is self-corrective. For example, collateral values rise during a bull market. This increases their access to lower priced funding and liquidity, which fuels further gains.

Finally, regret leads to confusing risk with wealth. Larger, better-capitalized financial institutions can absorb more risk than smaller institutions. Their greater risk tolerance lessens their downside sensitivity, especially during a bull market when income levels are high. Thus, risk appetite increases with wealth. Risk and return are, however, scale invariant. Larger institutions confuse the ability to absorb risk provided by capital with the desirability of the risk position. Therefore, they acquire under-priced, higher-yielding, higher-risk assets in bull markets.6

B. Overconfidence

Overconfidence occurs when we exaggerate our predictive skills and ignore the impact of chance or outside circumstances. It results in an underestimation of outcome variability.7 Overconfidence is reinforced by self-attribution and hindsight. Self-attribution involves internalizing success while externalizing failure. Structured finance bankers and quantitative risk managers took credit for results during the boom, failing to consider the impact of randomness and mean reversion creating an illusion of control.8 Hindsight involves selective recall of confirming information to overestimate their ability to predict the correct outcome, which inhibits

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6This is consistent with the H. Minsky financial instability hypothesis. Investors increase their risk exposures driving bull markets until they have taken on too much. See H. Minsky, 2008, Stabilizing an Unstable Economy McGraw-Hill.

7This is magnified by the naïve use of market-based risk-management tools.

8Studies indicated the underestimate at 15 %-25 %. The direction of the overconfidence is usually positive reflecting a related optimism bias.
Learning. Disappointment and surprise are characteristics of processes subject to overconfidence.

Industry and product experts are especially prone to overconfidence based on knowledge and control illusions. Knowledge is frequently confused with familiarity. This is reflected in the number of industry experts including most famously the former Federal Chairman who missed the collapse of the housing and structured credit bottom. Knowledge is frequently confused with familiarity. This is due, in part, to misguided overreliance on quantitative credit scoring models without understanding their limitations. Key model limitations include the following:

- Homogenous populations: Statistical models require large homogenous populations with a long history of observations. The new structured finance credit portfolios were small, heterogeneous, and concentrated with limited histories.
- Statistical Loss Distribution: Loss distributions for credit are skewed, with unexpected event losses hidden in the distribution’s fat tails. Models tend to be blinded by the mean and underestimate extreme events.
- Historical basis: History is a guide, not the answer. The past represents but one possible outcome from an event sequence and is not an independent observation. History becomes less relevant as markets and underwriting practices change. This was especially true for mortgage default models. They ignored the impact of securitization of mortgage originator underwriting practices.
- Uncertainty: Decisions involve both risk, known unknowns, and uncertainty, unknown unknowns, elements. Financial models adequately contemplate the former but inadequately deal with the later. Managing uncertainty requires judgment, not calculation.

Control reflects the unfounded belief of our ability to influence or structure around risk. Risk is accepted because we believe we can escape its consequences due to our ability to control it. Examples include the perceived ability to distribute or hedge risk, independent of the likelihood of being better or faster at identifying risk than the market.

This reflects an optimistic underestimate of costs while overestimating gains. Optimism is heightened by anchoring when disproportionate weight is given to the first information received. This is usually based on the original plan, which tends to support the transaction.

Time-delayed consequences magnify overconfidence as individuals weigh short-term performance at a higher level at a lower level.

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9 Inappropriately designed incentive compensation reinforces overconfidence.

than longer-term consequences. These occur whenever short-term benefits clash with long-term effects. Although we know of the potential negative long-term effects, we believe that they will not happen to us, at least during the current accounting period. An example is dropping credit underwriting standards to increase short-term income, market share, or league table status as occurred during the height of the boom.

C. Statistical

Statistical bias involves confusing beliefs for probability and skill for chance by selecting evidence in accordance with our expectations. Economics is a social science based on human behavior. Prices are not determined by random number machines. Rather, they come from trades by real people. Feedback loops, prices, trades and people complicate statistical modeling, and invalidate the use of normal distributions as used in the physical sciences.

Institutions find it difficult to accept chance and are frequently fooled by randomness. A manifestation is the representative bias, whereby we see patterns in random events. We interpret short-term success as “hot hands” by a skilled banker. Risk-adjusted return on capital and other measures are unable to distinguish results based on luck versus skill.

Statistically based risk management practices are inherently limited. They are unable to reflect the hidden risk that the state of the world may change rendering current state data obsolete. For example, switching from a boom to a bust cycle impacts correlations. Formerly diversified positions begin moving together, triggering unexpected losses. They are unexpected because such movements are unfamiliar. We tend to view the unfamiliar as improbable, and the improbable is frequently ignored.

Actions and outcomes can be unrelated. Consequently, it becomes important to examine the decision process and not just the outcome. As Scholes notes, to value risk or price reserves you must reflect the values of the options not purchased to hedge the position. Since this is not priced, it creates incorrect capital allocation incentives. Thus, the “lucky fool” is rewarded and encouraged with bonuses and increased capital until luck turns and losses are incurred. Examples include the numerous apparently lucky real estate experts at institutions like Bear Stearns and Lehman. Eventually, all lucky streaks come to an end as this one did during the summer of 2007.

Another statistical error prevalent during a boom is extrapolation bias. This occurs when current events or trends are assumed to continue into the foreseeable future, independent of historical experience, sample size or mean reversion. Undoubtedly, this resulted in many of the projections underlying structured credit proposals. The major error focused on the belief that housing prices would not decline nationwide in the US.

Perhaps the most dangerous statistical bias is disaster myopia. This occurs whenever low-frequency but high-impact events are underestimated. Since the subjective probability of an event depends on recent experience, expectations of low-frequency events, like a market or firm collapse, are very small. These types of events are ignored or deemed impossible, particularly when recent occurrences are lacking. This causes a false sense of security as risk is underestimated, or assumed away, and capital is misallocated. Unlikely events are neither impossible or remote. In fact, unlikely events are likely to occur because there are so many unlikely events that can occur. Thus, the longer the time period, the higher the likelihood of a “Black Swan” event occurring.

D. Herding

The previous discussion concerned individual psychological aspects of risk decision making. There are also social aspects to decision making when individuals are influenced by the decisions of others as reflected in herding and ‘group think’.

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16Black swans are high impact unexpected rare events. The term was popularized by N. Taleb in The Black Swan: The Impact of the Highly Improbable (Random House, 2007).
Herding occurs when a group of individuals mimic the decisions of others. Through herding, individuals avoid falling behind and looking bad if they pursue an alternative action. It is based on the social pressure to conform, and reflects safety by hiding in the crowd. In so doing, you can blame any failing on the collective action and maintain your reputation and job. Even though you recognize market risk, it pays to follow the crowd. Managers learn to manage career risk by clinging to an index. Essentially, principal loss is converted into benchmark risk.

Herding reduces regret by rationalizing that you did no worse than your peers. It constrains both envy during an upswing and panic in a down market. This is critical in banking when performance contracts are based on relative performance measures tied to peer groups. Herding underlies why banking experts’ forecasting abilities are poor. The experts tend to play it safe by staying close to the crowd and extrapolating past performance.

A related effect is an informational cascade. A cascade is a series of self-reinforcing signals obtained from the direct observation of others. Individuals perceive these signals as information even though they may be reacting to noise. This is referred to as a positive feedback loop or momentum investing, which can produce short-term self-fulfilling prophecies.

Herding amplifies credit cycle effects, as decisions become more uniform. The cycle begins with a credit expansion leading to an asset price increase. Investors rush in to avoid being left behind using rising asset values to support even more credit. This explains why bankers continued risk practices even though they feared this was unsustainable and leading to a crisis. Eventually, an event occurs, such as a move by the central bank, which triggers an asset price decline. This causes losses, a decline in credit, and an exit of investors, which strains market liquidity.

E. Group Think

Group think, or organizational pressure, enhances cognitive biases. It occurs when individuals identify with the organization and uncritically accept its actions. Once the commitment is made, inconsistent information is suppressed. Consequently, mutually reinforcing individual biases and unrealistic views are validated.

Experts are prone to group think. They tend to limit information from all but other expert sources. Thus, they repeat statements until they become accepted dogma regardless of their validity, due to a lack of critical thinking.

The recent subprime collapse illustrates this fact. The industry participants used the same consultants and models for their projections. The consultants based their reports and recommendations on the surveys of industry participants. Once the perception of a bull market took hold, it was reinforced and accepted uncritically. When the crash occurred, the experts were taken by surprise by a supposed perfect storm.

This is illustrated in the 2006 Business Week cover story in which risk officers at numerous institutions, including Bear Stearns and Lehman, are surveyed. They believed that despite the risks taken they were safer than ever. This belief was based on complex risk models and market diversification. The faith in risk management encouraged institutions to increase their risk exposures, believing they were under control.

F. Sentiment Risk

The aggregate investor error based on biases is sentiment risk. It can be either optimistic or pessimistic and is time varying as reflected in Figure 4.

Sentiment risk is zero in an efficient market. Paul Samuelson has noted markets in the short-term can be micro efficient concerning individual instruments, but macro inefficient regarding the market as a whole. Additionally, during the short-term the direction of the inefficiency is likely to widen due to momentum and herding. Most risk models ignored sentiment risk. This causes losses when sentiment changes leading to closed markets and mark to market losses which has threatened the basis of originate to distribute model. Investor responses based on the interplay of sentiment and market valuation is reflected in Figure 5.

During a late stage boom with high sentiment levels, A, behavioral risk factors will dominate and quantitative risk measures will be unreliable. This is reflected in the famous comment “As long as the music is playing, you have to get up and dance”. This is characterized as irrational exuberance where prices are driven principally by momentum and herding.

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19This is reflected in Keynes’ famous statement that it is better for a banker’s reputation to fail conventionally, than to succeed unconventionally.

20The industry expert impact is significant, as most large financial institutions adopted best practices based on similar experts.

21Relative performance measures are a form of sophisticated “me-too” metrics. Rather than focus on absolute value creation, they focus on arbitrary market silos that may be in a downturn.


reflected in high liquidity levels. When sentiment is low, fundamentals will rule as in B and C. Price may diverge from fundamentals, but are quickly eliminated by arbitrageurs in B and C. D represents irrational despondency found in market bottoms reflected in tight liquidity.

II. Remedies

Behavioral finance demonstrates how biases influence risk perception leading to underestimation of improbable events. We base our actions on experience of what has happened. This ignores beyond the data exposures leading to future blindness. Consequently, we misjudge actual risk leading to surprise losses.

Recognizing and dealing with biases is complicated by three factors. First, bias can be amplified within organizations due to incentive misalignment and group think. Next, we diminish information inconsistent with our existing views, while searching for conforming information. Finally, this leads to

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23See T. Debels, *Behavioral Finance* (Garant Uitgevers, 2006) 183 for a discussion of various forms of behavioral finances that can occur in markets.
a false sense of security and reduced vigilance. Potential responses to reduce biases will now be explored.

A. Principles

Historically, risk management has been primarily an exposure accounting and control system. While this controllership reporting function is important, protection is needed against it becoming a regulatory and quantitative ritual. The emphasis should be on forward-looking dynamic management, which involves three components:

1. Risk appetite involves determining how much an institution is prepared to lose, and is frequently defined by earnings at risk or a potential ratings downgrade.

2. The actual institutional risk profile is monitored through scenario analysis and stress testing applied against actual portfolio movements.

3. Corrective action is taken when a mismatch between the organization’s risk profile and appetite occurs. The corrective action can be at the transaction, when involving major exposures, or portfolio level.

Investors have difficulty in processing market signals. This comes from a failure to distinguish noise, price movements without meaningful changes in economic prospects, from true information. This difficulty places decisions at risk (DAR) as reflected in Figure 6.

Uncertainty, as opposed to risk, is difficult to manage due to several biases. Chief among these are optimism and overconfidence based on an illusion of control based on flawed models. These biases are amplified in certain organizations by compensation and governance problems. Bureaucracy and opaqueness inhibits responses until it is too late, leading to massive losses.

B. Alternatives

C. Practical alternatives to biased based bounded rationality exist. Some options include:

- New markets and product limits: Behavioral bias is strongest in areas where inexperience reigns, such as in the structured finance area with its new technology and limited history. Thus, strict limits to control exposure in these areas are needed.

- Obtain a second opinion: Anticipation of review by an unrelated third party encourages greater care.

- Beware of experts: Seek diversity to avoid myopic focus on issues within an expert’s area of interest. Experts frequently ignore the benefits of alternatives.

- List a wide variety of possible scenarios: Focus on unpopular and unlikely possibilities. View the future as a collection of eventualities rather than as a single prediction. The preferred decision is one that works across several possible eventualities, and not just the current market state.

- Avoid herding: Develop independent analysis. This requires encouraging contrarian views supported by compensation programs.

- Postmortem: Review both successful and unsuccessful decisions. The focus should be on whether the results were luck or skill-based. The key is to avoid rationalizing and hindsight bias and to learn from the experience.

- Directly engage the environment: Independent investigation is needed to verify and to avoid filtered information.

- Heterogeneous risk team: Construct a diverse independent risk team. Rotations can be used to maintain diversity.

- Lengthen risk horizon: Given the long-tail nature of credit risk, increase the evaluation horizon beyond the traditional accounting-based yearly horizon.

No process is foolproof. A backup procedure is needed to remove the temptation to accept unintended catastrophic risk. This is provided by portfolio control and enforced by the board of directors. Excess concentrations must be reduced or covered by additional capital. Also, strategies are needed for each position, allowing adaptation to random changes in market states. Institutions should invest in portfolio strategies, not in illiquid excess concentrations, which have two components.

The first concerns risk acceptance or transactional approval based on the institution’s risk underwriting criteria. Second is risk reduction through diversification. Diversification, however, does not prevent losses. Rather, it prevents losing everything at one time. The focus is on position size to avoid over betting. Institutions must guard against unproductive naïve diversification, which emphasizes the number of portfolio assets instead of their asset-class diversity. This is
critical because correlations are scenario specific and approach one during a crisis. Thus, the key is the overall asset-class allocation and not necessarily the number of assets in an asset class.

III. Current Crisis

A. Setting

A herding among financial institutions occurred during the last several years. Consequently, they invested too much at the same time in the same areas. This was done under guise of the “originate to distribute” model. This model allowed institutions to rationalize poorly structured, underpriced products by selling them to others. They failed, however, to consider the impact of markets closing down, leaving them with large high risk exposures.

Some institutions like Wells Fargo and Pittsburgh National escaped the herding. It is difficult to determine if they were lucky or smart. The pressure to herd is illustrated by Morgan Stanley. Under its previous management, Morgan Stanley refused to participate in structured products. Its performance suffered relative to its peers. Consequently, in 2005 it was replaced by a new team. They vowed to regain market share by matching its peers, which it achieved in 2008 by recording record losses.

A declining economy and falling markets triggered aggressive Federal Reserve interest rate cutting and liquidity injections in 2001 to 2002. Liquidity-driven technicals improved, resulting in falling risk premiums increasing credit asset prices. Institutions responded by adopting an asset-intensive carry trade strategy, which involves borrowing short-term to invest in longer-term risk assets.

A credit bubble formed as liquidity-driven technicals surpassed fundamentals. This was reflected in historically low credit-risk spreads in the real estate, leveraged buyout and structured credit markets. Spread narrowing and a flattening yield curve reduced the attractiveness of the carry trade, putting pressure on institutional accrual and trading budgets.

In the search for yield, institutions adopted a procyclical asset heavy 5Ls strategy:

• Longer duration (e.g., mortgage backed securities)
• Long tailed option type risk found in the AAA tranches of structured securities
• Large positions (e.g., multibillion dollar mortgage warehouse facilities)
• Leverage levels approaching 30:1
• Less liquid assets (e.g., collateralized debt obligations)
• The 5Ls strategy involves going long on higher-risk assets for the institution’s own account instead of distribution. The strategy is reflected in principal finance, merchant banking, bridge loans and warehousing activities. These activities represented up to 75% of revenues at some institutions.

• The risk inherent in the 5Ls strategy were obscured by judgment biases in the following areas:

• Unproven business models were justified based on optimistic plans while down-playing the negative possibilities due to group pressures.
• Institutional overconfidence in risk management models based on the illusion of control. This causes an observation of safety, which creates as illustrated by the Persaud Paradox, risk.24
• Peer pressure that was not based on independent economic reasoning. Nonetheless, as the Morgan Stanley example illustrates, ignoring peer pressure can be hazardous to your career.

This caused a major credit boom. During the boom, prices can exceed underlying fundamental economic values as illustrated in Figure 4. Such cycles, while predictable, are

24Persaud Paradox is the observation of safety created by using the same models as your peers, which creates model risk.
difficult to manage for several reasons. First, financial institution compensation is tied to peer group comparisons. Thus, firms and individuals not following their peers suffer. Next, organizations frequently discourage pessimism. Therefore, conservative risk managers and bankers are pressured to become optimistic or leave. Finally, institutions risk losing bankers if their risk activities are curtailed.

Frequently, positive short-term results mask long-term risks. Seemingly high returns can reflect the subjective probability of an event that has not occurred in the time period studied. Investing in such instruments is profitable most of the time. Eventually, a beyond the data event occurs. The housing event occurred in mid-2007 and has continued for more than eighteen months, costing billions in provisions. Individuals and institutions succumbed to a bias of “assuming the absence of evidence implied evidence of risk absence”.

B. Concerns

The appropriateness of the 5Ls portfolio strategy depends on several factors. First, it works best early in the cycle before the opportunities are exploited by the competition and spreads narrow.

Next, the strategy involves incurring increased systematic or beta risk exposure versus value-adding alpha returns. Structured products are less liquid than market investments. Consequently, the return on structured products reflects compensation for liquidity risk. This risk was poorly reflected in risk management models. The liquidity premium was mischaracterized as alpha. Thus, liquidity risk was under reported. This was subsequently discovered during the crisis.

Finally, pricing and trading discipline is needed to ensure an adequate risk premium is earned. Maintaining discipline becomes increasingly difficult as the cycle continues.

Warning signs began to form during the first six months of 2007:

- Continued Federal Reserve tightening
- Rating agency downgrades
- Flattening yield curve
- Increased mortgage defaults

Unfortunately, apparent success breeds an inability to imagine the possibility of failure, and the warnings were ignored. Firms continued to underestimate the likelihood and impact of unlikely events. Widespread credit risk under pricing existed due to an emphasis on nominal returns. This suggests a correction when investor emphasis shifts from return on capital to return of capital.

It is difficult to price rationally when risk seems remote and hard to measure and conditions seem favorable. The last market correction had occurred more than three years ago and was largely forgotten by the first half of 2007. Thus, risk sensitivity had diminished. This recognition problem is rooted in the complex nature of cyclical risk.

C. Regime Changes

Procyclical risk appetite and feedback loops underlie credit cycles. As risk appetite increases, credit extension expands. Investors use the increased debt capacity to bid asset prices higher. The higher asset prices increase collateral values, which supports additional credit expansion creating a virtuous credit cycle with increasing liquidity. A tipping point or event can, however, prompt investors to adjust simultaneously their positions triggering a decline in asset prices. Figure 7 shows that the decline can trigger a vicious cycle leading to reduced collateral values, curtailed credit, declining investor demand, falling asset prices and reduced liquidity.

The tipping point represents a change in investor sentiment based on an awareness of the risk that investors have assumed. Once the tipping point is reached, feedback overwhelms fundamentals and the trend dominates. Tipping points represents triggers, not causes of the change in investor actions. Overvalued assets, which are vulnerable to bad news, are prone to volatile investor sentiments. Thus, tipping points are unexpected and occur during the height of an over-valued bull market.

D. Reinforcement

The complexity of low-frequency/high-impact cyclical risk is compounded by institutional factors such as budgets and compensation systems that reinforce the behavioral bias effect. These systems favor “consistent” earnings and misread low-frequency/high-impact risk “profitability.” Such risk is similar to underwriting out-of-the-money put options. The premiums appear profitable until the put event occurs.

Risk models also contribute to the problem by presenting the illusion of safety and control, leading to over optimism.

President of New York Federal Reserve T. Geither, as quoted in the Financial Times, May 12, 2005.

Procyclical risk appetite is aggravated by ratings-based regulatory capital requirements. The regulatory rules reduce capital requirements during a bull market as ratings increase, thereby encouraging credit expansion. Conversely, they increase capital requirements during a bear market as ratings are pressured, leading to a credit contraction.

See D. Sornette, 2003, Why Markets Crash, Princeton, NJ, Princeton University Press. This is similar to physical events such as forest fires and earthquakes arising from “criticality.”
Backward-looking risk models confuse history and science. Unfortunately, financial markets are not actuarial tables. Some important model issues include the following:

- Inadequate consideration of the cyclical effect on, and correlation among, probability of default, loss given default and exposure at default

- Poor understanding of the interaction between liquidity and credit risk as bull markets create their own liquidity, which can evaporate in a downturn

- Feedback impact of models on markets is ignored. The observation of safety created by using the same models as your peers creates model risk.

- Difficulty reflecting out-of-sample, beyond-the-data possible effects.

Consequently, models underestimated low frequency/high-impact cyclical risk. The underlying exposure builds during a bull market as apparent risk declines, while the losses materialize in the bear market cycle. This anomaly is due to social and psychological biases resulting in bounded rationality. Ignoring these facts substitutes an inaccurate normative model for the real world.

The objective is to supplement existing quantitative risk management with developments taken from the evolving field of behavioral finance. In so doing, it can reduce future losses during the credit cycle as risk management evolves to a more balanced system, incorporating human behavior. This requires taking low-probability-worst-case scenarios seriously, and developing appropriate responses. The process is similar to earthquake engineering, which does not attempt to predict a shock. Rather, the focus is on constructing a structure to withstand a certain shock level.

Currently, counter cyclical capital charges decrease during bull markets as ratings improve as demonstrated in Figure 3. This fact underlies the procyclical bias in portfolio strategies as lower bull market capital requirements increase returns, encouraging an inappropriate, asset-heavy, 5L portfolio strategy. Supplementing currently determined capital charges with a requirement tied to asset prices would encourage a shift to a counter cyclical portfolio strategy. Capital levels would relate to changes in asset prices. The higher capital allocation serves as a risk-taking budget constraint during bull markets by dampening compensation-related returns.

E. Lessons Learned

Risk decisions are at a risk from behavioral bias. This is especially true when dealing with high impact low probability risks. Governance mechanisms represent possible control over the bias by introducing outside viewpoints. The specific action taken depends on the source of the bias. Figure 8

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reflects the possible combination of market and managerial bias.

Biased managers operating in an efficient market, A, need to be protected by their boards of directors and regulators from overreacting to market noise through tight controls. Classical financial theory is represented in B with efficient markets and rational managers who require limited oversight. Rational managers operating in a biased market, C, will exploit market inefficiencies by selling over priced claims. When both managers and markets are biased, D, which characterized the late stage of the boom, the situation becomes problematic. Boards and regulators are likely to fall prey to the same behavioral biases as affecting managers and controls are likely to fail.

IV. Conclusion

Presently, it is difficult to consider the end to the bear market. Defaults are increasing and liquidity remains fragile. This difficulty is compounded by behavioral bias reinforced by institutional factors. While no two cycles are identical, we must resist the temptation to say, “This time is different.” The deeper we are into illiquid credits, products and structures, the more difficult it becomes to manage risk. The key is to identify potential adverse scenarios, stress-test to determine their impact, compare the test results to our risk appetite and take appropriate portfolio decisions. This entails adopting counter cyclical portfolio strategies despite negative short-term revenue implications. This also requires adopting difficult infrastructure changes.

Organizational obstacles inhibit appropriate responses to high-impact low-probability risks. Chief among the obstacles are short-term compensation systems which reinforce behavioral biases. This leads to a potentially fatal neglect of the longer-term build of risk. As Robert Merton noted “The amount of risk we take personally, individually, or collectively is not a physical given constant. We chose it.” Behavioral finance offers a means to choose wisely, as it affects both individual decision making and market efficiency. You ignore behavioral risk at your own peril.

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References


