

Intelligent risk

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CHAPTER REPORT

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This issue of *Intelligent Risk* follows PRMIA's Global Risk Conference in New York, celebrating the organization's tenth year. The conference collected a distinguished and diverse group of thinkers and risk practitioners to discuss subjects including macro and emerging risks, new regulations and managing through crises. The conference was well-attended and wonderfully received, with attendees and participants from around the globe. Plenary sessions included thought-leaders Kenneth Rogoff, Robert F. Engle, Hersh Shefrin and Emanuel Derman. Panel discussions provided broad and deep insights and some provocative ideas, such as financial historian Charles Calomiris' argument that the Glass-Steagall Act passed in 1933 had nothing to do with the crisis it was supposed to address and was rather the result of political horse-trading. The conference also provided opportunities to network with risk practitioners and experts and see how current products and services providers present and position themselves in an increasingly competitive marketplace.

We are pleased to present articles on a range of subjects in this issue. Here are a few highlights:

- Contributor Allan Grody argues that financial reform as currently conceived may be unworkable without substantial re-engineering of our financial institutions.
- In a broad discussion covering financial products (debt and commodities), market dynamics (imbalances and volatility) and human capital, Jonathan Howitt argues that market discipline cannot be relied upon to resolve mispricing of risk in time to avert crises.
- Danielle H. Ferry from sponsor Moody's Analytics discusses the uses for expected default frequency under stress, an approach that links economics and finance via real-time market data, financial analysis and robust stress scenarios.
- Bill Sharon discusses the ways that our "clamor for confidence" paradoxically works against confidence. Observing that we experience risk as feeling rather than rational thought, he helps make the case for the intersection of behavioral finance and risk.¹
- Andrew Jennings, Chief Analytics Officer of FICO, discusses ways that combining traditional point-in-time credit risk assessment with forward-looking models generate useful estimates. He suggests tools and technology to manage risk counter-cyclically while improving financial performance, strengthening customer relationships and managing regulatory concerns.
- Mark Olson and Susanna Tisa of Treliant Advisors discuss disruptions from economic shifts and the need to adapt business models on the fly. They warn that many organizations will have to "reinvent themselves entirely just to survive."
- David Samuels of S&P Capital IQ discusses building confidence in measuring risk across business lines as part of the evolution from Basel II modeling to the capital and liquidity requirements of Basel III.

As the slow motion explosion of the Euro zone crisis surpasses attempts to manage its impacts, we hope to learn from the experience. Professional risk management continues to blend quantitative and qualitative thinking, to incorporate elements of academic and practical analysis and to balance both insights and limitations of mathematics and social science. Enjoy this issue and, as always, we welcome your feedback on what we are doing well and where we can improve.

MICHAEL H. MARTIN, Editor
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Michael H. Martin is a Sustaining Member of PRMIA, a senior examiner for Office of Comptroller of Currency and founder of a management consulting firm. He has written on business and risk management for Fortune, BNet and other publications. The views expressed do not necessarily represent those of the OCC.

1. For an editor this raises an interesting question: If risk is experienced as a feeling, does it follow that poetry has place in the literature of risk management? Perhaps we should initiate a section devoted to the topic. We can call it "Risk-a-Verse."



LETTER FROM CAROL ALEXANDER

We have just celebrated the first 10 years of PRMIA's existence at our highly successful Global Risk Conference, where over 400 registered delegates and 78 speakers gathered together in New York to participate in a program packed with path-breaking plenary sessions, stimulating panel debates and thought-provoking concurrent sessions and seminars. The vision of our founders – to build a new association on ethical guidelines, transparency, higher standards and strong educational

links – has been realized through the dedication of hundreds of individuals who volunteer their time to work towards our common goals. The volunteers who dedicated much of their time to organizing this conference were Dominik Dersch, Sohayla Fitzpatrick, Marc Groz, Hans Helbekkmo, Xia (David) Li, Justin McCarthy, Daniel Rodriguez, Jayaradha Shankar and Kalyan Sunderam. To all of you on the Conference Planning Committee, PRMIA staff and especially to its Chair, Ruth Whaley – many thanks indeed!

Since the first PRMIA Summit in 2003, with the participation of Jean-Claude Trichet, PRMIA has established an international reputation for its conferences. For instance, the first Americas Summit featured Richard Sandor (father of futures and emissions markets), Glenn Hubbard (then President of the White House Council of Economics, now Dean of Columbia Business School) and Elliot Spitzer (then Attorney General in New York). And the CRO Summits hosted by the New York chapter every spring and fall continue to be highlights of the hundreds of PRMIA chapter meetings held annually world-wide.

The 10th Anniversary Global Conference was the largest conference undertaking in our history. An extract from the Conference Planning Committee's report follows:

Audience and speaker feedback confirms they considered it an outstanding educational and networking event. The mix of quantitative and qualitative discussions on macro risks, quantitative finance and crisis management all stimulated lively debate and enjoyment. Attendees came from 22 countries and over 200 organizations. The Gala celebration honoring PRMIA's Founders and Higher Standard Award winners was packed with applause from 320 guests. The speakers were terrific, generating endless audience questions. The sessions were wide-ranging, all intellectually challenging, but positioned to provide practical take-aways. Thirty-one corporate sponsors and supporting organizations were actively engaged with the program, delegates and exhibits.

Most of our nearly 85,000 members were not able to attend, so we have posted all the presentations from those speakers who have given permission on the website at www.prmia.org/globalriskconference/speaker-presentaion.php. These are available to all Sustaining Members and conference delegates. Now is a good time to upgrade your membership to take advantage of this. Photos from the conference are available online at <http://www.prmia.org/globalriskconference/photos.php>.

This event added value to the PRMIA brand by raising awareness of the tremendous energy and range of expertise within our association. We recommend to all readers that you volunteer locally. It's a great way to keep conversations on risk topics moving forward, while networking with like-minded people and having much fun in the process.

To those readers who are thinking of joining, it is important to understand that PRMIA was established as a grass-roots association – that is, it is run by its members. One of the main drivers of our growth has been the sharing of knowledge across developed and developing markets. Our 85,000 members come from around the world. And we have almost 70 chapters distributed over the main financial centers in all three global economic

regions. Today our operations are supported by a 7-figure budget and a highly dedicated team of professional staff, continually expanding as our association grows. But still, the grass-roots nature of PRMIA remains very strong. Today, more than 600 volunteers, across many different cultures and geographies, are dedicating their time to PRMIA with the common aim of promoting the exchange of knowledge. The ultimate purpose of our great association is to establish sound risk management standards and practices globally.

The Global Council of Regional Directors has a key role to play in supporting local chapter development and providing the link between the worldwide strategic goals of PRMIA and the activities in each local chapter. Interacting with like-minded individuals that you can find at any of our chapter meetings is always an enriching and rewarding experience. To date, we have had over 100,000 attendees at PRMIA chapter events worldwide.

PRMIA has also gained an enviable reputation for its non-profit ideals. Our commitment continues in many ways, including reduced pricing for students and members located in emerging economies; honorariums for winners of the Higher Standard Award; and awards for best papers. During the past five years especially our educational services have blossomed under Jodi Lundell's dedicated operational management. We now have an acclaimed weekly webinar series led by high-profile industry leaders and key risk management academics, a stock of over 700 online courses, and numerous customized in-house training programs that focus on applied research, current topics and of course best practices in risk management. Central to these activities is our university partnership program. Currently, we have 23 academic partner institutions in 14 countries.

To conclude, from the young student who is only just embarking on a career in risk management to the senior risk professional who has decided to reach out to a wider network, PRMIA will offer all new members a place to share experiences with like-minded individuals that are motivated to serve and lead our profession.

PROFESSOR CAROL ALEXANDER
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Barry Schachter Named to PRMIA Board

PRMIA has named Barry Schachter to the PRMIA Board of Directors. His term begins immediately and continues through October 2013. Dr. Schachter replaces Thomas Day, who stepped down from the Board in January.

Dr. Schachter has over sixteen years of risk management experience. He was previously CRO of Woodbine Capital Advisors and before that was head of risk management at Moore Capital, headed the risk functions at SAC Capital, Balyasny Asset Management, and Caxton Associates. He has also worked on the sell side at Chase. He spent 6 years in the public sector at the Comptroller of the Currency and the CFTC. In the early part of his career he was in academia, most of that time at Simon Fraser University. He has published in both academic and practitioner journals. He is a Fellow of the Program in Mathematics of Finance at the Courant Institute of NYU and is a Research Associate of the EDHEC Business School. He is a member of the Advisory Board of the International Association of Financial Engineers, the editorial board of the Journal of Derivatives and founded and maintains the risk management website GloriaMundi.org.

Dr. Schachter has been an active member of PRMIA since 2002, currently serving as Publications committee co-chair and member of the PRMIA Education committee.



PRMIA GLOBAL RISK CONFERENCE



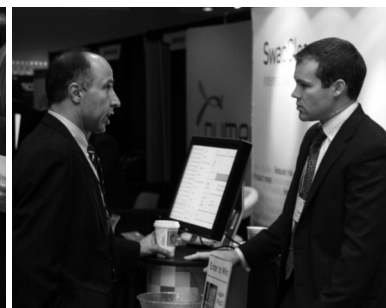
Marriott Marquis, New York City
May 14-16, 2012

We are pleased to report that the PRMIA Global Risk Conference recently held in New York went very well.

Feedback from delegates and speakers confirms that it was an outstanding educational and networking event. The mix of quantitative and qualitative discussions on macro risks, quantitative finance and crisis management all stimulated lively debate.

The conference featured over 400 registered delegates and 78 speakers representing 22 countries and more than 200 organizations. Additionally, it was supported by 31 corporate sponsors and supporting organizations.

The presentation materials that speakers have agreed to make available are now posted on the PRMIA website at <http://www.prmia.org/globalriskconference/speaker-presentaion.php> and are freely accessible by PRMIA Sustaining members.





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MARKET DISCIPLINE AND LESSONS FOR LONG FINANCE

JONATHAN HOWITT

The Public Debt Mountain

While it has always been in the nature of monarchs and sovereign states to finance their ambitions with debt, only during the 20th century did the acceptance creep in that it might be economically beneficial for governments to continually borrow to stimulate the economy given the cheap cost of funding. It was, after all, politically convenient and since the 1930s arguably quite successful for Western economies. Whatever the debate about how the public money was spent, the post-war growth and stability made it appear affordable. Even the more independent central banks went along with it.

Now, deficit spending may become the victim of its own success. Almost all G20 countries are running deficits. Budget deficits in the US, UK and Japan are at least 8-10% of GDP, a significant proportion of which is interest payments. With growth rates of less than 2%, this is unsustainable.

Had there not been a banking crisis followed by a Eurozone crisis, the concern might not be so immediate. Gross public debt¹ nearly doubled in the past 30 years in the US and the UK to 115% and 86%², and increased fourfold in Japan to 253%, even as the cost of funding this government debt dropped. 10 year rates in the US and the UK plunged from more than 10% to less than 2%. In Japan they went from over 7% to less than 1%.

What explains such pricing of risk? It may reflect the relative safe haven of sovereign debt versus other financial assets. (Certainly this is the implication of Basel capital rules which designate OECD sovereign obligations as “risk free.”) It is also helped by expectations that central banks will repurchase debt (for quantitative easing) and keep short-term rates low (to stimulate growth). What this suggests is a deliberate attempt by central banks to ‘inflate away’ their debt in a kind of “stealth default.” Yet markets have chased yields down and allowed the central banks effective control of their long term interest rates. Governments have also encouraged this endeavour: the political incentives to continue with debt financing at low rates are very strong. It is in the nature of governments to persist with such anomalies — until they unravel.

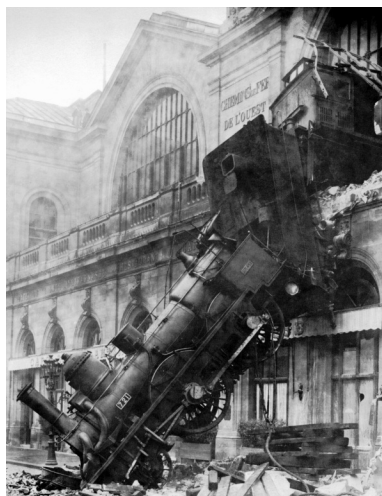
At what point might this confidence trick fail? When does market discipline take over? The Eurozone experiment may answer such questions. One of the most illogical market movements in recent times was the convergence of interest rates for countries expected to join the Euro in the late 1990s. For a period, all Eurozone countries were able to borrow at near German rates.

Not anymore. Market discipline for the Eurozone meant a

sudden re-pricing of risk. Since the scale of problem wasn't apparent until the after the re-pricing took effect, fixing the situation now requires a managed default. Recall that Greek 10-year interest rates were 5% at the end of 2009, having held steady for almost a decade. They exceeded 35% in 2011 amid debt renegotiations and bailout discussions. Similarly, Portugal: 10-year rates of 4% at the end of 2009 rose above 15% by the end of 2011. With contagion potentially spreading to Spain and Italy, political pressures weigh on the ECB to purchase the debt of weaker Eurozone members and contain the rise in long term

rates. Amid extensive uncertainty, the Eurozone seems trapped in a low growth scenario for years to come.

The simple lesson for Long Finance is that you can't rely on market discipline to resolve a mispricing of risk in time to avert a crisis. In the Eurozone context it is the buffer at the end of the track, a backstop with dangerous consequences if hit at sufficient speed.



Global Trade Imbalances

Japan's perennial trade surpluses have trended steadily downwards under pressure from an ever-appreciating currency. By 2011 the yen versus the dollar increased nearly fivefold since Bretton Woods collapsed in 1971, a staggering economic adjustment for a trading nation.

The effects of imbalances must terrify China as well. China's currency actually depreciated between 1980 and 1994 (from 1.5 to 8.5 renminbi to the dollar). It remains stubbornly above 6 renminbi. Yet the imbalances which drove the yen's appreciation over time are even more marked with China, which has an annual trade surplus with the US over \$300bn and over \$3 trillion in reserves. This is not sustainable, any more than it was for Japan.

For almost 20 years, Japan's domestic demand boomed and its economy rode through the oil shock of the 1970s and the US recession of the early 1980s. The yen experienced a threefold increase to 120 versus the dollar in 1989. Then the party ended. Japanese equities suffered and the large cap Nikkei index

1. IMF forecasts to 2016 for the US and Japan, 2013 for the UK

2. If public pension obligations were added, this ratio might be double



collapsed (at one point by more than fivefold from 1989). Smaller companies fared even worse and it was only by more than tripling its national debt and reducing interest rates nearly zero that Japan cushioned the blow to the wider economy.

This policy has arguably run its course. Excessive levels of public debt have crowded out the private sector. Banks and pension funds are stuffed with JGB (Japanese Government Bond) holdings rather than commercial loans. Economic reality has yet to bite Japan, which will need to make enormous fiscal adjustments to reduce its national debt. With an aging population (more than 25% over 65 and only 12.5% under 15) the political will may not exist.

If Japan's experience is not over, China's has yet to unfold. China's trade surplus with the US is 5% of its GDP. This gives China room to boost domestic demand and relatively low levels of government debt (16% of GDP and falling). At the same time, China's export-driven economy remains exposed to a sharp appreciation in the renminbi. Better that China allow such an appreciation to happen gradually rather than waiting for the proverbial hard landing.

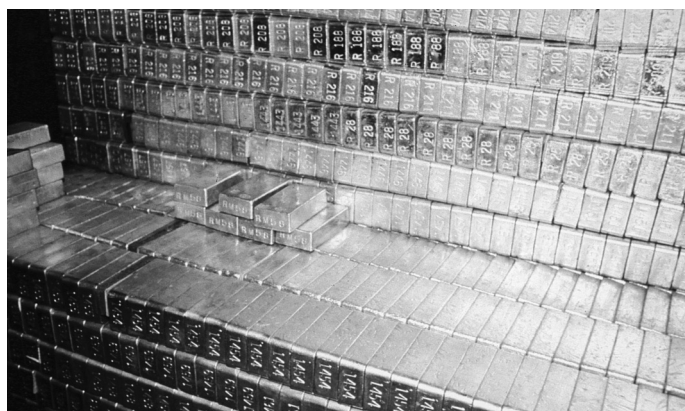
To the extent that its lessons can be learned, Japan's experience may even be salutary. For Long Finance, the more prolonged the market imbalance (in Japan's case the latter half of 25 years of Bretton Woods) the more severe the adjustment. In this regard, the US trade deficit (at more than 3% of GDP across all trading partners) makes for unhappy reading. However, given the size of its domestic economy and because the US has allowed the dollar to depreciate gradually (by more than 25% on a trade weighted basis since the early 1970s), the problem may ultimately matter less for the US than for China, which holds more than half the US deficit.

Commodities and Reserves

Commodities, by definition, should be relatively cheap and readily available. Prices are subject to dramatic fluctuations, notably based on supply interruptions (natural or human-caused). Yet when commodity markets are generally liquid and actively traded they achieve a fine balance between underlying supply and demand. Reserves, by contrast, should be long term stores of value accumulated over time. They should rarely diminish in value or be subject to sharp price fluctuations. In practice, the US dollar has been the de facto reserve for central banks since the

abandonment of the gold standard in 1971. Of approximately \$10.2 trillion in global central bank reserves, about a third is held in dollar assets. Another \$1.7tn is held in gold (about 1 billion ounces at current prices).

Gold has remained a good store of value for the last 10 years, rallying repeatedly from \$300 to over \$1900 per ounce in 2011. Prior to that, except for a short-lived rally in the early 1980s, it was better labelled a commodity than a reserve holding. Its price should differ significantly based on how it is categorized.



This begs the question of when a commodity becomes a reserve and vice-versa. Since the oil shocks of the 1970s and the establishment of OPEC oil prices have been volatile despite relatively abundant proven global reserves (currently about 1.4 trillion barrels). Prices rose from under \$10 to \$145 a barrel between 1998 and 2008, then dropped below \$40 in early 2009. They were again above \$110 in early 2012. In the short term, oil looks like a commodity; longer-term and strategically it behaves like a reserve—at least as long as consumption steadily rises and commercially viable alternatives remain limited.

Efforts to protect and guarantee the supply chain of natural and industrial minerals, especially by China, underlie much of the rally in mineral commodities over the past decade. For example, copper's commercial use has seen a six-fold rise in prices. In this context control of resources may be considered a reserve currency in its own right, a hedge against ever-increasing costs of production in a sustained growth scenario.

The most significant cost of production in more developed economies is human and intellectual capital. Reserves of human talent in high margin sectors such as technology, pharmaceuticals and professional services sustain growth in economies where the manufacturing labour has become uneconomic. Parts of the developing world are catching up fast: as developed countries struggle with aging populations, China and India produce more than 2 million science and engineering graduates each year.

Long Finance has posited the idea of an eternal coin, a reserve currency not subject to market fluctuations that acts as an instrument rather than an object of market discipline. Rather than relying on volatile currency and commodity assets, we should consider designing a new currency based on human capital and ingenuity, perhaps our most abundant and stable long term reserves.



Confidence and Volatility

History, however, teaches us that humanity is often its own worst enemy. At his inauguration in 1933, Franklin Roosevelt's assertion in the depths of a financial crisis that "The only thing we have to fear is fear itself," has a familiar ring today.

Human capital may be relatively stable and productive, but human business and consumer confidence are fickle and often over-react to uncertainty, creating self-fulfilling and pro-cyclical swings in economic activity. Consumer confidence both in the US and the EU over the past 30 years have been volatile, impacting demand and imposing severe consequences on asset prices. At the turn of the millennium, the Conference Board measured US consumer confidence at a score of 145, up from the previous decade (1985=100). By early 2009 it fell to just 25 and it remains depressed today (at around 60, which is actually up from 40 since October). Similarly, EU confidence indicators fell from a peak of +3 in May 2000 to negative 34 by early 2009. They stand at negative 20 today. European markets continue to track consumer confidence downwards: the Eurostoxx 50 index is less than half its value in 2000 and corporate bond markets reflect stress as well, with investment grade spreads up from near zero 5 years ago to 400 basis points in late 2011. Non-investment grade

spreads rose from 200 to 800 basis points by late 2011, after peaking at 1200 basis points in early 2009.

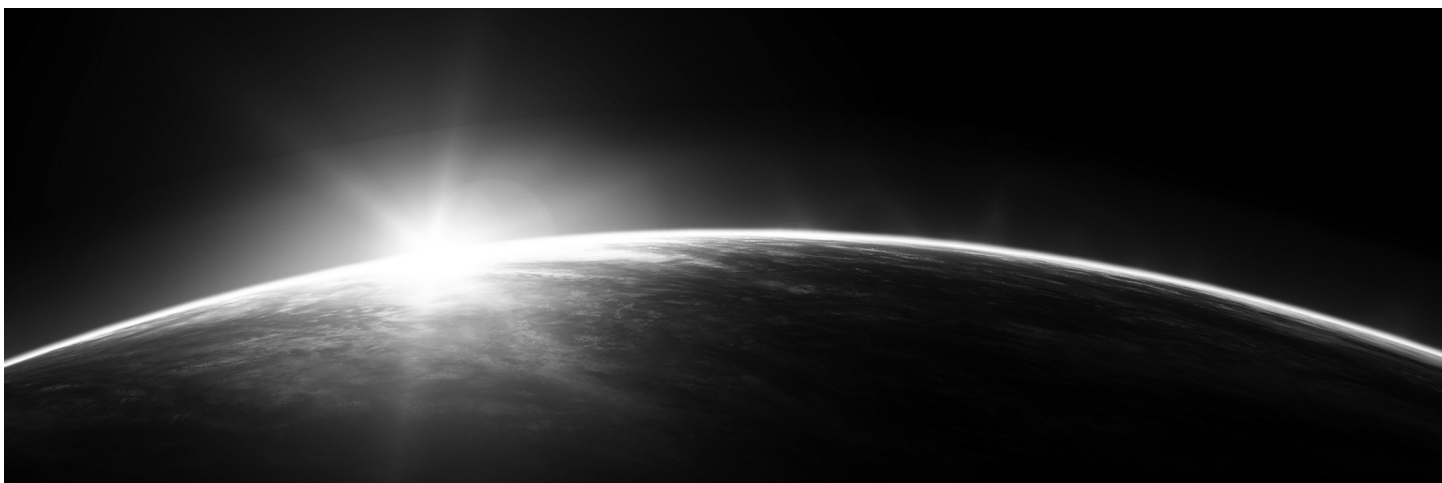
Such symptoms have real economic costs in terms of business planning, funding, and hedging of risk. Market discipline implies a consistent, one-directional correction; economic uncertainty creates dramatic swings in a 'risk-on, risk-off' world. The CME's volatility index (VIX) reflects this, rising from a low of 10 in 2007 to almost 90 in October 2008. Since that time it has fallen to 15 and peaked above 50 twice. With large swings in economic expectations and asset prices, how can business make any long-term decisions?

Uncertainty and its defining characteristic of market volatility is the real enemy of Long Finance. To some extent we can mitigate its impact by addressing economic anomalies and imbalances (assuming we can find the political will to do so). We can and should invest in our global reserves of human talent and invention in order to strengthen supply side stability. Demand-side dynamics, however, require us to conquer the excesses of our collective confidence, our irrational exuberance and stubborn, short-sighted risk-aversion. These remain the greatest challenges to ushering in a golden era of Long Finance and to our becoming masters of market discipline.

ABOUT THE AUTHOR



Jonathan Howitt has extensive experience in risk management on both the buy side and sell side. Most recently Chief Risk Officer at Evolution Group, he previously established the operational risk functions at Man Group and Dresdner Kleinwort, and was involved in the early stages of the development of the operational risk discipline, including discussions with regulators on its definition and measurement for Basel 2. Prior to his career in risk management, he held various senior Finance and COO roles at UBS and Citibank, in London, Tokyo and New York.



COUNTER-CYCLICAL RISK MANAGEMENT: GOING BEYOND CREDIT HISTORY

ANDREW JENNINGS

One hard-learned lesson of the financial crisis for banks is that a reliance on customer credit history alone may prove insufficient for managing portfolio credit risk. Credit scoring models typically provide a snapshot of risk assessment at a point in time based on historical data. Credit risk, however, changes with economic cycles and banks that don't consider how evolving macro-economic conditions affect their overall credit risk may find themselves behind the economic curve. They are more likely to over-extend credit when the economy is beginning to slow, or to be overly restrictive when a growth cycle starts. Both cases are costly to the institution and, on an industry-wide basis, can lead to systemic risk.

Banks need to consider not only the potential impacts on their profitability and customer relationships, but also the stricter regulations related to systemic risk. The Basel III framework stresses counter-cyclical capital management strategies. More powerful credit-scoring systems that take into account how economic changes impact credit risk provide benefits by improving financial performance, preserving valuable customer relationships and better managing regulatory concerns.

Following the Economic Cycle

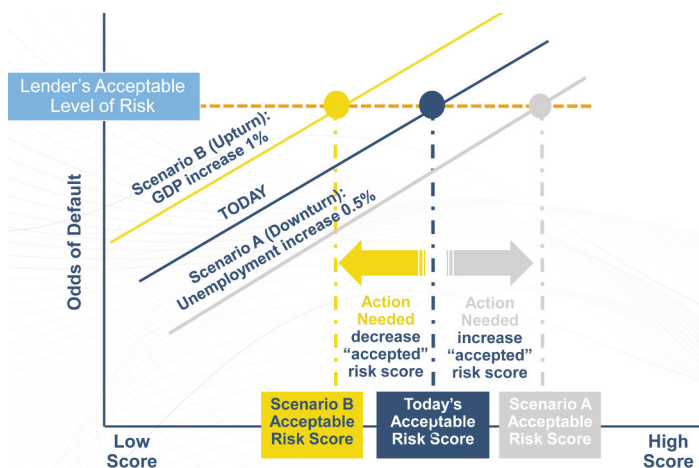
Traditional consumer credit-scoring models consider a variety of factors, such as delinquency history and credit utilization, to determine the risks for individual borrowers. The scores thus provide a "point-in-time" assessment of risk and the current probability of default when credit is offered to a new customer or reviewed periodically for existing customers. Banks traditionally make credit decisions based on increases or decreases in a customer's credit score as well as the expected default rate at those new scores. That approach, however, doesn't take into consideration the role that the economy plays in changing a customer's score or the probability of default at the new score.

When the economy improves consumer credit performance

generally follows suit as illustrated in Figure 1. As a result, the ratio of future good accounts to bad account for any given score, or the odds-to-score ratio, will also increase. As the expected probability of default declines, so will the risk weights and capital requirements at the institutional and systemic levels allowing credit volume to increase. Misreading this improvement however can lead to an overexpansion of credit as lenders respond to competitive pressure. Conversely, when the economy is trending downward, the opposite scenario can occur. As the probability of default rises, banks become risk averse and may over-tighten credit. When other banks follow suit, economic recovery at a national level slows. In both cases, the pro-cyclical approach is counterproductive and unprofitable. Banks lend money at lower rates when they should be tightening, and restrict credit when they should be welcoming new customers.

In short, although credit scores have made a powerful, positive impact on consumer finance by allowing lenders to make more informed decisions more quickly and reach more customers effectively, they have shortcomings such as lagging changes in the economy. New technology provides a more powerful method of assessing risk by combining the traditional point-in-time assessment with forward-looking models that provide estimates based on different economic scenarios.

Figure 1: Illustrating the impact on customer decisions



Managing Compliance

In addition to helping banks better adapt to economic trends, a forward-looking approach better meets regulatory demands for more effective reduction of systemic risk and better compliance. When lenders establish provisions and determine capital reserves, they must understand the risks in their portfolios under stressed economic conditions. A key criticism of Basel II was that it heightened cyclical risk and helped set the stage for the economic crisis. The Basel III framework emphasizes counter-cyclical capital management and calls for a buffer to counter-balance the influence of the broader economy. The aim is to build stabilizers into the banking industry to help dampen exuberance in times of credit growth while preventing over-tightening that inhibits recovery.

FICO has been working for some time with European lenders

to incorporate economic projections into Basel Probability of Default (PD) models. Using the derived odds-to-score relationship between a lender's PD score and various economic conditions, lenders can simulate the expected PD at a given risk-grade level in many different scenarios. Such lenders can more accurately calculate forward-looking, long-term PD estimates in ways that meet regulatory requirements and optimize capital reserves in a more efficient and reliable manner. This helps banks free up capital for lending and credit without taking on unreasonable risk. It also improves the bank's compliance program and reduces the time and resources required for effective oversight.

Managing Risk Counter-cyclically

To be most effective, this counter-cyclical approach must be applied at the decision-making level, the point at which banks decide on a day-to-day basis whether to lend to a new customer or extend additional credit to an existing one. By adding a forward-looking component, banks improve their capital management while more finely attuning their credit decisions to their customers' changing circumstances.

Economic changes affect score-based risk assessment in two ways. The probability of default may rise for a given score, and more borrowers may migrate into a pool with a higher probability of default, thus increasing a bank's overall portfolio risk. A forward-looking approach estimates future economic indicators, such as unemployment, interest rates and housing prices, and predicts effects on probable default rates at various score levels. With these tools, institutions make more informed decisions across the customer lifecycle and adapt quickly to changes in market conditions.

To manage risk counter-cyclically, banks should look for technology that can be applied to a chosen portfolio and score, and tailored to capture the relationship between market factors and the selected score's odds-to-score relationship. The technology must work with various scoring measures, such as

origination scores, behavior scores and broad-based bureau scores. Finally, it should integrate into existing systems and build on current risk management tools.

Shifting Ahead of the Curve

By assessing risk based on past performance that is also adjusted for current and potential future conditions, lenders can limit losses by tightening credit policies sooner, for the right populations, in an economic downturn. Limiting losses using forward-looking approach also allows an institution to grow its portfolio responsibly. Predicting future risk levels based on anticipated economic conditions, lenders can better determine whether and when to proactively loosen credit policies as markets recover.

The economic landscape is perpetually changing on regional, national and global levels. Tools that enable banks to manage risk counter-cyclically help them to make better account and portfolio decisions in the ever-changing economy, in essence allowing them to shift gears ahead of the next turn of the cycle.

ABOUT THE AUTHOR



Andrew Jennings is FICO's chief analytics officer and head of FICO Labs. He has held a number of leadership positions at FICO since joining the company in 1994, including a stint as director of FICO's European operations. Before joining FICO, Andrew served as head of unsecured credit risk for

Abbey National plc, where he introduced account behavior scoring and mortgage scoring. He also served as a lecturer in economics and econometrics at the University of Nottingham. He holds a bachelor's degree and Ph.D. in economics, and an MSc in agricultural economics from the University of Wales.

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RISK ADJUSTING THE FINANCIAL SYSTEM

ALAN D. GRODY

Implementing financial reforms requires workable solutions. Those currently on the table in the US should be “paused,” until we are confident that we are proceeding logically, that the changes are integrated and that they provide long-term (ideally permanent) solutions on a global scale. The current approach of piling on more and more regulations, with unknown impact in totality on top of a poorly understood business model with crumbling infrastructure is a prescription for colossal failure.

Last November, the G20 held its summit in Cannes, France to discuss managing risk in the global economy. Heads of state laid out the broad policy and political issues; financial ministers discussed the difficulty of defining and legislating rules while simultaneously preventing unintended consequences. Ultimately their goal was to reduce the likelihood that financial institutions would be infected with the contagion of systemic risk. Although it was clear that the system’s risk management methodologies required significant repair and that data transparency would need to be assured, it was less clear how to achieve these goals while balancing ongoing, seemingly daily financial crises with the longer-term goals. The group’s next meeting was held on June 18–19 in Mexico City where decisions were taken. We describe some of them below.

The core of the problem is not new. Over a century ago two separate ideas were presented that ultimately changed the course of our thinking about resolving the financial crises of today. First, Louis Bachelier, a French mathematician observed similarities between the movements of particles floating in liquids and changes in prices in securities markets. Others built upon these observations decades later to tie the mathematically precise and the predictive physics of fluids in motion to the determination of stock prices. No matter that the precise rules of the physical world and the emotional and psychological rules of securities markets differ significantly. Second, and also over a century ago the Minneapolis Grain Exchange invented the central clearing house for mitigating counterparty risk.

While regulators push to implement the reforms envisioned in the Dodd-Frank legislation, among others, it remains an effort fraught with unintended consequences. Critical components including the “Volker rule,” moving Swaps onto central counterparties, mortgage “skin in the game” rules, funding advantages for “too-big-to-fail” (TBTF) institutions and other factors must be addressed before the rules can be finalized. The new Basel III pronouncements on capital adequacy and leverage ratios also raise concerns about unintended consequences. Enacted hastily, these financial measures risk stopping the wheels of finance and setting our capital, contract and currency markets on a path that may lead to the global economy again teetering at the brink if not falling off a cliff entirely.

Recall that US legislators rushed through financial reform legislation, which passed only by the slimmest of majorities in the Senate. The mantra was “just get it passed, we will fix it later”.

The result is a patch work of separate rules that neither a legislator nor even his staff could understand in its totality. Of course, the TBTF and too-complex-to-manage financial institutions didn’t understand their businesses completely either. Additionally, the failure of Basel and its capital regimes to predict the financial crisis or protect us from its consequences raises questions about its fundamental theoretical underpinnings. That too is up for grabs with the recent Basel consultative paper questioning trading book VaR methods.

In hopes of contributing to thoughtful progress, this author offers the following recommended steps to more permanent financial industry regulatory reform:

Establish a New Center of Gravity for Financial Reform

- The G20’s new Financial Stability Board (FSB) needs to get up and running quickly and must take a more proactive implementation role, with resources and funding to match. A globally connected financial system driven by financial institutions that know no sovereign government boundaries requires broad oversight. The FSB should be at the center of global reforms with responsibility to standardize and push out what sovereign regulators agree to, not the other way around as is now the case. An ombudsman-like Global Risk Management Council (GRMC) consisting of former heads of regulatory agencies and national banks, risk management practitioners and academics should engage with systemically important financial institutions’ (SIFIs’) CEO’s *and their clients* (that is, “Main Street” CEOs and other financial market

participants) to bring both compromise and resolve, as well as hands on practical experience to the job of risk adjusting the financial system and strengthen the bully pulpit of the FSB and local regulators.

Fix the Plumbing

- A globally applicable, unique identification system starting with financial trade counterparties, then derivatives product identifiers, needs to be put in place quickly. Without such a system, meaningful financial transaction transparency is not possible and systemic risk will not be observable. The initial project, referred to as the legal entity identifier or LEI has already been approved by the Financial Stability Board and has just recently been approved by the G20 at their June 2012 Summit.
- The proposed approach to aggregating financial data to assess systemic risk will not work as currently envisioned by the Dodd-Frank legislation. Gathering required position, cash flow and pricing data and sending it daily to a government data center for standardization and reconciliation will present huge data workflow problems and require a large government back-office work force. Better to leave data in place at financial institutions where reconciliation processes already exist and have that data conform to global identification standards. Let search technology aggregate information on the fly. Financial transaction transparency and a universal identification system should start us on a path to where computers can ultimately be able to monitor cash flows across the globe and be able to detect the equivalent of an emerging hurricane, typhoon or tsunami.

Adjustments to Central Counterparty Concepts are Required

- Central Counterparties (CCP's) should be networked together both from a technical communications perspective and a collateral/cash margin perspective such that many CCP's backstop each other, transferring funds, positions and accounts if one CCP fails. There will be many CCPs doing the same thing in different regions or markets - multiple SWAP CCPs are already here. Common shocks would be dissipated by normal capital and insurance backstops, daily marks-to-market and variation margin calls.
- Clearing houses should also be subject to contingent capital requirements similar to those for TBTF financial institutions. Private equity should be encouraged to provide a call on their capital as a final layer between exhausting clearing house capital and calling upon the government to bail them out. Providing such a contingent capital call for CCP's could be structured so as to pay an insurance-like or put option-like premium for this backstop. Significant returns were earned by the government on TARP funds, suggesting this could be an attractive investment for Private Equity firms and Sovereign Wealth Funds.

- Since cross-margining privileges or capital and insurance tranches to backstop CCPs may be difficult to mandate given the private nature of participants, regulators can observe the net exposure across CCPs by aggregating the same counterparty's net positions in each CCP and request additional capital be set aside at the counterparty directly. If the counterparty is not a financial institution, regulators could request more collateral to be put up at the financial institution introducing the counterparty to the CCP.

Revisit "Boring" Banking and "Exciting" Investment Banking

- Investment banking and proprietary trading should return to their roots based on a partnership-like, private entity structure. The "risk it all" model is fine when the risks reside with the clients and partners seeking rewards. The "boring" part of banking is actually not so integrated with the risky activities. They mainly exist in separated business silos, each with their own connections to the outside world, with separate P&L's and so on.
- The problems that arise from the cascading effect on liquidations of assets when a risky organization blows up may be mitigated by having enough margin/collateral available that the clearing bank/prime broker can assume the assets and hold the positions for future sale without having to liquidate in a panic. The trading business could be incented through carried interest capital gains treatment.
- Value creation for publicly owned banks or other financial institutions can be accommodated by simple client business relationships with these private partnership-like entities for provisioning prime brokerage, trade execution, and clearing services. The top and bottom line fee revenues and profits of the banks offering these services would be preserved excepting that the liability of capital depletion would be external and born by the partnerships. The banks could have a profit sharing arrangement with the private entity.

Adjust Compensation for Risk

- Incentive compensation must be risk weighted, with global standards for those risk weightings set in ways similar to those used to determine asset risk weights for capital. Even restricted stock, five year payouts and claw backs don't work when a company that wants to hire away an entire trading desk with sign-on bonuses equal to the net present value of their the future incentive compensation. Tie compensation to the risk adjusted use of capital and the risk weighted approximates for tradable products. That would serve as a good starting point. Each firm could use a globally derived benchmark to risk weight their products. Each firm's compensation committee would be required to document deviations from the benchmark to justify both total and individual employee deviations. In the US, organizations could sign off on these arrangements under the control requirements specified in Sarbanes-Oxley.

Rethink the Use of Capital

Capital provisioning has proven better as a measure that counts down to failure than as a mechanism for preventing losses. Riskier businesses and products and TBTF financial institutions are indemnifying newly designated SIFI's rather than mitigating the risks they take. Incremental changes to capital requirements that reflect the false assumption that it mitigates risky behavior should be re-examined. A tiered financial industry is already emerging: SIFI designation lowers the cost of funds and sets the institutions up as more desirable counterparties. Their perceived status becomes that of new Government Subsidized Entities (GSEs), like Fannie Mae and Freddie Mac!

Improve Risk Management Techniques

- Current risk management methods based on historical losses and statistical methods are inadequate. New thinking and incentives for additional methods are needed for more proactive risk management that detects risk exposures as they build up. One approach is to risk weight processes and products and tie these weights to the notional values of products as recorded in the accounting records. A calibrated, abstracted measure of risk can be defined (similar to the evolution of retail and commercial credit scores and ratings). These scores can be calculated dynamically and tied to causal factors for risk mitigation purposes. The FSB should encourage multiple experiments and provide incentives for improved methods and systems beyond those provided for under BIS's incentives for improved loss modeling.
- Reviews of VaR in practice for enterprise risk management should ignite debate around the well-known but under-appreciated mathematical deficiencies of VaR as an additive measure. This deficiency inhibits the aggregation of risk and leads management to rely less on VaR during stress situations. VaR has evolved more as a regulatory risk measure than as a useful management tool for enterprise risk assessment. As a result, we need to fundamentally rethink the alignment of risk management positional data with the notional values recorded in the accounting records, a technique some have dubbed "Risk Accounting."

Come to Grips with Operational Risk

- We should call a "time out" on the use of the Risk Control Self Assessments (RCSA's) for operational risk. This approach requires management to guess at severity and frequency of losses. Thereafter, through a series of discussions, management and risk officers agree on the risk profiles identified and then use such "guesses" to allocate capital. Better to get initial judgments about key drivers of risk at a granular level from management, standardize those across business silos and then compare similar businesses across institutions. By benchmarking with the appropriate granularity across a myriad of processes, measurement of operational metrics will better mesh with other risk metrics and, one hopes, become more proactive.

Model Interconnectedness More Effectively

- The ways financial institutions and their infrastructure and service providers interact both create risk as well as mitigate risk. Regulators and others have been aware of global vulnerabilities for some time but are only recently turning their attention to cross-border, cross-asset, cross-firm and multi-party trading and clearing structures. These interactions are difficult to understand and complex to model, with few if any effective models that consistently identify interconnections and stress points. Better modeling would help in identifying risks and stress points in organizations and activities that are currently not getting noticed. Recent attempts to add another layer of capital to SIFI's is an attempt to get at this issue but will probably prove ineffective, in line with the comments on capital buffers above.

Conduct Real Stress Tests

- Stress test scenario analysis must follow precise guidelines independent of political interests and country or firm idiosyncrasies. Scholars, retired practitioners and former policy professionals could serve as "global ombudsmen" (beholden to no vested interests or political agenda) as described earlier. They could help craft and maintain such guidelines. Stress tests should not exclude sovereign assets based on a lack of political will.

Re-engineer Financial Corporations in Order to Create Real "Living Wills"

- Re-engineer the financial corporation from the bottom up so that the building blocks emerge in ways that permit a firm to be disassembled in an orderly way. This will take time. The first step is a globally unique identification system for financial products and financial participants, which the G20's FSB is already commissioned to put in place by March 2013. This should be followed by an industry/government owned reference data utility. Disentangling financial institutions from the plumbing and identifying key business application systems by line of business or product will surely follow.
- As currently conceived, the notion that a living-will will guide regulators of too-big-to-fail institutions to dismantle or recover them from a serious capital depletion or failure is whimsical at best. It serves to deflect regulators and legislators from practical approaches to addressing the failure of giant, globe-spanning institutions. How can a government entity break-up and reconstruct the tangible and intangible assets of these firms (which include people, systems, facilities, positions, transactions, intellectual property, etc.); while also managing these firms' interrelationships with each other; and with vendors, investors and clients in ways that properly define the possessions to be distributed? Currently we can't even describe the legal entities of the firms and their hierarchy of ownerships.

Improve Mortgage Markets

- Originating and securitizing mortgages is desirable, but first so-called “Ninja” (No- Income-No-Job-No-Asset) loans should be banned. Skin-in-the-game for originators should be required at point of inception, with standard, prescribed at-origination documentation. A Mortgage Origination XBRL Taxonomy (MOXT) and associated form, (similar to what we currently use for SEC financial statement filings) will provide much sought-after traceability and auditability. This is necessary for effective securitization.

Improve Credit Ratings

- Rating agencies should be in the same penalty box as derivatives construction engineers and risk modelers — none are exact sciences and should not be treated as such. Why do rating’s agencies’ pseudo-mathematically derived judgments have special status under the law? Substituting a general fiduciary duty to be a prudent investor under the law would foster new ways to think about risk decisions.
- Better to provide public data to all on defaulted investments, bankrupt companies and collapsed sovereigns and encourage the world’s academics, practitioners and entrepreneurs to find better ways to use them. One can envision many toiling at perfecting Monte Carlo simulations of all the possible default paths under a multitude of scenarios. Multiple viewpoints should inform investors’ judgments. This is preferable to relying on judgment calls by individuals or committees at for-profit rating agencies.

In the final analysis, only a re-engineering of our financial institutions will accommodate the risk adjustments required for financial reform. Lacking a blueprint to follow and working with strategies built on false assumptions, our financial enterprises have evolved into their current forms. Industry infrastructure followed in the form of giant too-big-to-fail financial market utilities. Now more of such in the form of CCPs for Swaps and Swaps Data Repositories are being contemplated through legislation. As a result, the global financial system is not

understood either by CEOs who run these institutions or regulators who are mandated to oversee them.

Operating as they do in an interconnected global economy, such firms are neither well-managed nor properly regulated. They have evolved without a plan. The local market and sovereign country oversight was overwhelmed by the global nature of these evolved entities. More contagion will surely infect the system if nothing is done to address the systemic problems on a global scale. This will take significant time, not the modest delay advocated by some in order to suit the Dodd-Frank regulatory agenda.

Funding is needed for a series of infrastructure projects if we are to rebuild our financial institutions and provide a lasting risk management framework. Such a framework needs to keep pace with both the global nature and the technologically intense attributes of the financial system and its correspondingly global potential for contagious, systemic risk.

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REBUILDING THE FINANCIAL SERVICES MODEL IN A VOLATILE ECONOMIC ENVIRONMENT

MARK W. OLSON AND SUSANNA K. TISA

Who hasn't heard the expression "it's really hard to rebuild a car while it's driving along the road?" The financial services industry now finds itself in exactly this predicament. The global economy is experiencing major paradigm shifts that are fundamentally disruptive to the current business models of banks and nonbanks that touch retail and commercial consumers of financial products both directly and indirectly. Whether rapidly implementing new mortgage servicing practices under threat of a regulatory enforcement or deploying new technologies that open security gaps, financial services industry players are taking on significant new risk exposures that current business models fail to address. In many cases, organizations will be challenged to reinvent themselves entirely just to survive. Knowing this, it is important for banks and nonbanks alike to explore the nature and impact of these disruptions to the economic environment, and to proactively and surgically reconstruct their business models without veering dangerously off the road.

The World has Changed

Many of the drivers for business model change are a direct result of shifts in the global economy that permanently increase levels of financial volatility and create new risk exposures. These include accelerating emerging market economies, disruptions created by the economic crisis in Europe, improvements in technology, financial product innovation, stricter regulatory enforcement, and the proliferation of cyber-crime and terrorist threats. How quickly and effectively the financial services industry adapts to these changes will determine the frequency and impact on the US economy of future economic crises and political developments elsewhere in the world.

Acceleration of Emerging Market Economies

Certain paradigm shifts in the global economy began long before the mortgage foreclosure crisis and Eurozone instability were on anyone's radar screen. One fundamental change was emergence of the BRIC nations, short for "Brazil, Russia, India, China" first coined by Goldman Sachs in 2001. This group is expected to account for 41% of the world's market capitalization by 2030, according to a 2010 Goldman Sachs report. China is currently the world's second largest economy after the United States and could catch up to US GDP by as early as 2020. Adding South Korea, Indonesia, Mexico, Egypt and Taiwan to the mix creates the so-called EAGLES, emerging and growth-leading countries whose expected contribution to world economic growth in the next ten years is expected to be larger than the average of the G6 economies. As these countries become larger and more dominant players relative to the US economy, financial volatility resulting from increased interconnectedness of global capital markets will only accelerate.

Eurozone Instability

The specter of Eurozone unraveling and recession continues to roil domestic markets and it is unlikely that such volatility will abate anytime soon. European financial institutions are actively

buttressing their balance sheets in preparation for Basel III and in response to dismal stress testing results. Their actions to divest assets and rebuild capital will reverberate through the global economy for years to come. Whether this will create new opportunities for US banks to seize market share or whether the jobs lost by retrenching foreign banks will destabilize a still-fragile economic recovery in the US remains unknown. At the very least, the bad news coming out of Europe continually batters consumer confidence and drives increased market volatility.

Technology Advances

Another fundamental global change that began over a decade ago is the global proliferation and evolution of the Internet. When the Internet bubble burst in late 2000, the focus was eyeballs and e-commerce. Today, the Internet facilitates rapid-fire financial transactions and communications across borders, time zones and language barriers. This contributes to a host of new and unpredictable risks in security and privacy for financial services companies.

At the same time, rapid advances in hardware and software make many of core or legacy systems at financial companies outdated, despite endless efforts to patch them to remain competitive. New entrants gain competitive advantage by deploying new systems with no conversion costs and limited operational integration issues. For established players, large-scale overhauls of banking systems that our customers rely on have to be "cut over" with enormous investments of money and time and careful planning. One misstep in a conversion can give eager bloggers and tweeters ample fodder for a reputation-destroying field day.

Product Innovation

The foreclosure crisis may have put residential securitization markets into a three year swoon, but the pace of innovation in many other financial products has not slowed down one bit. New rules and guidance spawned by the Dodd-Frank Act and related regulatory reform incent financial executives to creatively replace

revenues legislated out of existence or reinvent old products to meet new requirements. Nifty technologies such as smartphone wallets that live just outside the existing regulatory framework are re-defining convenient mobile banking, but security and privacy concerns may lead to creation of inflexible rules that stifle these innovations prematurely. The key to success with new financial products will be staying within the (ill-defined) boundaries of consumer financial protection, by avoiding features that violate UDAAP (unfair, deceptive and abusive acts and practices) or fair lending (discrimination) standards.

Increased Regulatory Enforcement

A significant upturn in regulatory enforcement actions over the past four years has affected nearly every industry player, from community banks with commercial real estate concentrations to residential mortgage servicers to default management service providers. Banks have been ordered to revamp credit underwriting, appraisal, and credit administration capabilities within accelerated timeframes. Large mortgage servicers have been hit with enormous financial penalties and some are expected to retool their servicing operations to meet new mandated standards within similarly accelerated timeframes. Vendor management requirements have significantly tightened, pushing regulatory compliance requirements down from banks to service providers. In order for companies to respond timely to new requirements and avoid penalties and sanctions an unprecedented level of business process change must take place throughout the financial services value chain.

Crime and Terrorism

Finally, the world has become a smaller yet not a safer place, despite significant advances in communications and mobility that ought to support greater transparency. Cyber-crime and security threats can put entire organizations and networks out of commission for hours or days, disrupt millions of transactions, and cripple business activities. Gangs of criminals operate with apparent impunity from remote locations to steal money and personal identities, launder money, and fund illegal activities or terrorism, often anonymously from behind a computer screen. As critical intermediaries, financial services companies are squarely in the middle of these disturbing trends and must rapidly develop sophisticated detective and preventive controls and try to stay one step ahead of creative and well-funded criminal elements.

New Risk Exposures Must Be Effectively Managed

Pro-active organizations should have in place specific strategies and multi-year tactical plans that lay out actions and resource investment (in both technology and people) to effectively manage the risks associated with each of these developments. Organizational monitoring mechanisms must identify emerging trends and related risks. An enterprise-wide risk management group should naturally include such monitoring and report to the appropriate governance body, such as a Board-level risk committee.

Organizations also have to reinvent how they communicate and integrate risks between functional silos. Significant advances

in tools that support governance, risk management and compliance (known as GRC systems) track and integrate enterprise-wide risks in ways that have been difficult to achieve in large, far-flung and complex operations. Of course, to benefit from such tools, companies must define their risk appetite and governance mechanisms, set in place the appropriate cultural and incentive structures, and communicate objectives and intentions broadly. Only at that point can effective configuration of an enterprise-wide risk management system begin.

To address integration issues, risk assessment should be woven into the fabric of new product development — in fact, approval of any new product should incorporate documentation of risk considerations prior to launch, with business leaders held accountable for managing those risks as they achieve their projected returns. Many potential UDAAP or other regulatory violations can be recognized early if such evaluations are included as distinct steps in the product design process.

Tom Curry, the newly appointed Comptroller of the Currency, recently identified operational risk as the most critical risk exposure banks now experience. This public pronouncement caught everyone by surprise, as credit risk has long been treated as the number one risk exposure during safety and soundness examinations. This signals an important shift in regulatory focus that banks and non-banks (who may be under the CFPB's umbrella or who serve regulated banks) should watch.

Examples of operational risk he specifically highlighted are poor internal controls for legal document execution, inadequately monitored credit concentrations, insufficient BSA/AML suspicious activity detection controls, weak vendor management, and lack of attention to model validation. Mr. Curry pointed out that the value chain for financial services today includes not only regulated institutions, but also the technology vendors and service providers who perform critical operational functions. Robust vendor management processes are expected to include risk-based, well-documented initial and ongoing due diligence activities. Vendors are expected to comply with these raised standards or potentially risk being prohibited from offering services to regulated institutions. The new Comptroller also observed that in his view, model validation has been given inadequate focus or lip service by institutions up to now. All models (broadly defined by interagency guidance) used in any capacity within regulated institutions will require periodic independent validation of assumptions and logic. Mr. Curry's remarks indicate that these issues will receive increased scrutiny in upcoming regulatory examinations.

In summary, risk management itself has to undergo a significant paradigm shift to be relevant in our interconnected, rapidly changing global economy. Individual risks cannot be evaluated in isolation and must be managed in an integrated fashion across the enterprise. Pro-active and strategic organizations can rebuild without slowing down by leveraging new risk technologies, approaches and thought leadership, and thereby gain a valuable competitive edge for the future.

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IMPROVING CREDIT APPROACHES IN A BASEL II-III WORLD

DAVID J. SAMUELS

Bank executives face many challenges over the next couple of years. They must shape their businesses for sustainable profitability while meeting a series of regulatory challenges that include upgrading Basel II credit modeling and preparing for the higher capital and liquidity requirements of Basel III.

Our experience is that banks are still filling in gaps and placeholders in their credit modeling from the last rush for compliance. More problematically, they are also figuring out how best to replace Basel II models that turned out to be inadequate in practice. We call this the “second wave” of Basel II. With regard to Basel III, uncertainties about the details of key mechanisms such as the countercyclical capital buffer remain. Nevertheless, we are sure the new regulations will do the following:

- Ratchet up capital and funding costs for most banks during the 2013-19 phase-in period
- Drive banks to identify which businesses make money after adjusting for risk and capital costs, to deploy capital more efficiently, and to find new operating efficiencies
- Place a premium on risk systems that are robust and credible to business leaders as well as regulators

As a result executives should understand the connections between second-wave Basel II and the coming Basel III requirements. In effect, Basel III will leverage second-wave Basel II efforts at modeling risk and prolong banks’ efforts to confront increasing capital costs in a difficult business environment. This will be challenging, but also presents an opportunity to re-forge the connection between risk-taking, capital, soundness and profitability. Banks must translate their risk appetite programs into business realities using management levers such as capital allocation, performance measurement and remuneration. Most fundamentally, banks must strengthen and increase the credibility of their approaches to both credit risk and capital modeling. The results are expected to inform business and management decisions much more directly than in the past. This requires a clear picture of the critical issues in credit modeling and robust validation procedures.

Improved credit risk assessment supports risk-based decision making

Risk-based decision making	Role of improved credit framework
Optimized credit approvals, credit selection and credit limit setting	<ul style="list-style-type: none"> ■ Improved credit scores, PDs, and improved LGDs can be applied actively and dynamically in setting and monitoring credit limits. ■ Improvements support economic capital based limit setting and concentration risk management
Internal capital adequacy assessment	<ul style="list-style-type: none"> ■ Improved credit risk measurement is the key input for internal capital adequacy and accurate economic capital analysis.
Risk-based pricing and deal structuring	<ul style="list-style-type: none"> ■ Accurate, granular credit measurement supports differentiated pricing (e.g., economic capital-based), and optimal deal structuring (e.g., optimal trade off between customer PD and loan terms such as amount and quality of collateral).
Business line capital allocation (RAROC) and business strategy	<ul style="list-style-type: none"> ■ Business unit evaluation and planning based on accurate assessment of credit costs. ■ Improved product and customer relationship profitability analysis incorporating true risk costs.
Risk-based remuneration	<ul style="list-style-type: none"> ■ Accurate, internally credible credit risk analysis is a key pillar for risk-adjusted remuneration strategies in credit businesses.
Efficient credit platform	<ul style="list-style-type: none"> ■ Supports quicker, better portfolio and deal decisions and reduction in underwriting costs.

Improving Credit Risk Modeling

To effectively discuss ways to increase the accuracy of credit models, banks should start by asking whether the organization is structured to succeed. This isn't simply getting the right organizational chart, but answering questions about whether the bank is deploying the right resources to win the credit modeling battle in these key areas.

1. Shaping the approach to credit based on today's strategic realities

Management should take a hard look at credit resources and policies to ensure they reflect both profitability and risk. Many banks have changed strategic shape since the financial crisis; others will follow over the next few years. Some will remain trapped in yesterday's strategic reality. Leaders will apply their best internal talent to high-value, high-return credit efforts linked to their bank's competitive and specialist strengths. In other areas, such as benchmarking, data sourcing, and model building it may be more efficient to leverage third-party solutions.

2. Assessing the new range of credit approaches open to the bank

There has been extraordinary growth in credit data and credit research technologies in recent years. Banks should understand new credit methodologies that are available in areas such as project finance risk and other 'low default' portfolios. They should also understand the new and greatly increased external data available to develop credit models. Some banks carry on along their existing costly paths simply because the relevant specialists may be unaware of global developments in credit methodology.

3. Creating efficient credit information and workflow

Modern banks must align their credit rating and scoring process to ensure they are efficient, logical and transparent — and ensure up-to-date information is readily incorporated into the key management reports right across the entire organization.

After considering these big picture issues, management should take a "forensic" look at the credit approaches and models that exist in different business lines. Often the family of models has multiplied over time. In our experience, banks benefit from tackling multiple, common shortcomings strategically. These include levels of granularity, use of financial ratios, qualitative and non-financial elements, ineffective models, structural issues, mapping and loss given default.

“...banks must develop and apply validation skills if they wish to improve and generate confidence in business-critical risk models, such as those underlying economic capital, RAROC-calculations, and risk-adjusted remuneration.”

We discuss each briefly below:

Building the right level of granularity in the risk modeling

The right degree of granularity, particularly determining the 'right' number of sector-specific credit models, is an ongoing challenge. Applying one model too widely results in inaccurate ratings for certain industries and can lead to manipulation of the model by the analyst. On the other hand, banks

that build many models sometimes find that this effort becomes focused on the particular skills of their internal quantitative modelling team – and the internal data available to them – rather than the deeper credit insights that should inform model methodology.

Our advice is that the number of rating models is a function of the risk profiles and portfolio significance of the bank's obligors. If the underlying risk factors are the same and the risk profiles are homogenous, then the same rating or modeling approach can be adopted. If not, a different approach is warranted.

Too much emphasis on financial ratios

It is tempting to use financial ratios as a proxy for creditworthiness, not least because using them is quick, easy and cheap. As every bank analyst understands, however, other factors are at least as important. These include the industry sector a company inhabits, the company's competitiveness within that sector, and quality of management.

These other factors—we call them 'business risks'—have a complex relationship with financial risk. A company with a stable industry risk profile may be able to support a relatively weak financial profile. Many of the problems we observe in modelling start with misunderstandings related to assessing non-financial risk and then combine mis-assessment with an otherwise valid approach to financial risk.

Inconsistent use of qualitative and non-financial risk elements

Business risk plays a critical role in determining the credit risk of an obligor. It is often the major differentiator between obligors of relatively high credit quality, and helps to make a rating more forward-looking. However, non-financial risks are notoriously difficult to assess objectively and consistently.

One useful approach is to apply sector-specific scorecards that guide expert decision-making. That way, the correct risk factors are considered and scored with objective criteria. This leads to a more consistent, transparent and replicable rating process.

Ineffective models for low default sectors

Portfolios with low rates of default (for example large corporations, financial institutions, public sector enterprises, commercial real estate) rarely generate sufficient default data to

conduct robust statistical analysis. At the same time, banks that use external data to strengthen their analysis run the risk of selecting a data set that fails to capture the risk characteristics of a given portfolio.

Careful sourcing of better external data is a start, as is recognizing that banks must sometimes rely on “expert judgment” (in rigorous and objective ways) rather than mechanically applying statistical analyses.

Coping with structural issues such as parental support

Some credit assessments are complicated by structural issues including exposures to holding companies, subsidiaries, affiliates, joint ventures, government relationships and the like. The effects can be positive (for example reliable parental support) or negative (if there is a high degree of discretion in how cash flows are allocated across subsidiaries in a given situation).

Statistical models, especially those that rely on financial information as predictive factors, seldom address such complexities effectively. In practice, such structural issues must be treated rigorously and methodically in ways that draw out precisely the relevant credit impacts, for example by using ‘overlay’ approaches with objective, consistent criteria that help analysts adjust standalone ratings to account for structural issues.

Incomplete or inaccurate mapping between ratings and PDs

Given the frequent scarcity of usable, high-quality internal data, a key challenge is how to map internal ratings to objective rates of default. Such mapping exercises are useful for many reasons, notably for calculating bank capital adequacy in Basel II’s Internal Ratings Based approaches.

Mapping a bank’s internal rating grades to those used by Standard & Poor’s is helpful because Standard & Poor’s ratings can be associated with a decades-long record of credit events. However, this process must account for methodological differences between the bank’s rating approach and that of S&P.

Improving the treatment of Loss Given Default (LGD)

For some banks, increasing the accuracy of Loss Given Default estimation represents an important opportunity to improve credit and capital management. Most banks lack sufficient LGD data to conduct robust statistical analysis for all key business segments and must carefully augment internal loss data with the best available external data (which should meet Basel II guidelines on LGD estimation).

Crafting an approach that balances appropriate statistical analysis of available LGD data for each portfolio with the insights and judgments of internal and external experts is the key to success.

Getting Started – Validating the Models

Validating credit risk models should not only increase the

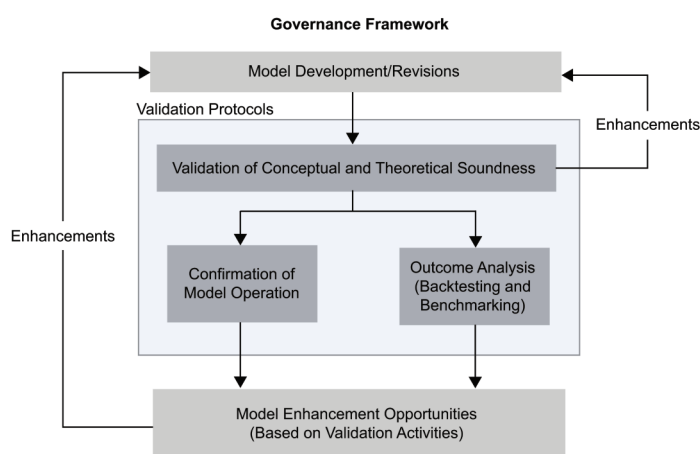
“Banks must translate their risk appetite programs into business realities using management levers such as capital allocation, performance measurement and remuneration.”

accuracy of the bank’s risk measurement but also build credibility and confidence in the bank’s approach. The model validation process should thus include independent review of the structure, calibration, performance and operation of a risk system (e.g., internal rating system) as well as scrutiny of the construction and

methodological soundness. This is vital if the output of the model will be used to make major business decisions and drive key management levers (especially regarding risk-adjusted profitability and remuneration). In practice, validating internal rating systems is often viewed as a set of technical tests generating a pass or a fail. However, some regulators use the term “mosaic of evidence” to describe the validation process in order to capture multiple dimensions of robustness. The most important dimension is a model’s conceptual soundness — is it the right tool for the job?

Validation Framework

Review Of Validation Framework



Determining the answer means analyzing whether the model captures the key risk characteristics of the portfolio in question, including the assumptions that underlie statistical models as well as model construction issues. For example, does a given model use data that reflects the risk characteristics of the portfolio in terms of appropriate time frames, entity and geographical focus.

Effective validation requires participants with backgrounds in fundamental credit analysis across varying portfolios as well as modeling expertise, so that the team understands where modeling and data assumptions may be incorrect. It can also be helpful to benchmark an internal model against an independent assessment of credit or compare model results to those of an accepted, well-known statistical model.

Effectively using a model is also critically important. Validation

teams must understand how a given model will be applied by the business line. For example, a test may suggest that a model's estimation of default rates is particularly weak for credits in the lowest grade of "Pass." This could reflect a technical problem with the model or pressure on the rating process as the business line struggled to meet targets. If the latter, the best solution may be determining a more realistic trade-off between risk and reward, such as requiring a rigorous rating process but permitting acceptance of slightly lower quality credits in return for additional mitigating factors and/or increased premiums.

Finally, model validation should include a range of outcomes analysis that includes statistical back testing (for example discriminatory power, calibration tests) and benchmarking (versus third-party models) in order to explore the model's strengths and weaknesses. Ideally, validation will support a continuous improvement for the bank's credit models and practices and add more value than simply passing an annual test.

Conclusion

For many banks, initiating a program of improvements to credit modeling may be one of the most significant responses they can make to the "second wave" of Basel II and to Basel III. Improvements in this area will not only improve capital calculations, they will help banks target and invest in the right portfolios in a tough business environment. In the next half decade, banks must develop and apply validation skills if they wish to improve and generate confidence in business-critical risk models, such as those underlying economic capital, RAROC-calculations, and risk-adjusted remuneration. Building confidence in how risk is measured across key lines of business is as important an objective as regulatory compliance.

ABOUT THE AUTHOR



David J. Samuels is Managing Director and Global Head of the Commercial Lending Segment for S&P Capital IQ. In his role, David Samuels is responsible for growing the segment business including setting the commercial strategy for individual markets; driving sales and marketing activity; and providing thought leadership within the market.

Prior to joining Standard & Poor's, David Samuels was Chief Operating Officer and head of ERisk, an Oliver Wyman spinout which he helped to sell to and integrate with the public financial software company, Sungard. Over four years at ERisk, he managed a global business that pioneered the commercialization of software based offerings for economic capital and RAROC analysis, aimed at improving an organization's risk based decision making capabilities.

Prior to ERisk, Mr. Samuels spent four years as President and CEO of Zoologic Inc., a Bankers Trust company and the global leader in the risk and capital markets e-learning space and prior to that was Vice President - Head of Global Field Operations at CATS Software a provider of sophisticated risk management and trading software, which he helped to sell to and integrate with the public financial software company, Misys. Earlier in his career, Mr. Samuels was Vice President at SunGard Capital Markets and a Financial Analyst with Andersen Consulting.

David Samuels holds a B.S. in finance and marketing from the University at Albany. Mr. Samuels writes and speaks frequently on topics of Credit Risk and Economic Capital. Selected risk publications include: "Rapid Credit Surveillance," "Risk Appetite and the Pursuit of Strategic Advantage" and "Staying Two Steps Ahead in a Deteriorating Credit Environment." Mr. Samuels is also active in various professional and non-profit organizations.

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THE CERTAINTY OF UNCERTAINTY

BILL SHARON

Over the past year we have heard intermittent calls for the restoration of confidence, usually by those who would relax all manner of regulation and oversight of commercial and financial ventures. The past, it would seem, adds credibility to their argument. Regulation in the financial markets and the internal financial operations of publicly held companies has done absolutely nothing to prevent the ongoing crisis we find ourselves in.

But this clamor for confidence tells us that despite all the calculations, projections and efforts by central banks to keep the flow of money moving it all comes down to how we feel. If we felt confident, we are told, then we would behave differently. The pathway to that better feeling varies from deficit spending to balanced budgets with the advocates of either position passionate about the correctness of their remedy. But no matter what we do our feelings are only buoyed only for a few days and then sink once again. We feel uncertain that we were right to feel better.

There are many analogies to this situation; Einstein's definition of insanity comes to mind; doing the same thing over and over and expecting a different outcome. Another would be the problem of transitioning from a moral society in which we apply a known set of rules to every situation to an ethical one where we begin to understand that solutions are intuitive and not measured solely by numbers on a balance sheet.

We are discovering that our set of rules is no longer relevant to the problem. Laurie Hyland, in a set of papers that can be found at www.thenewmoneyreality.com provides us with a pathway to understand the new context we are all living in, regardless of whether we choose to acknowledge it. The following example is borrowed from her work although its application is my own.

Take a bowl and let a marble slide down its side. Eventually the marble comes to rest. In classic physics we say that the marble has reached equilibrium. In classic economic terms this is equivalent to the certainty that we allegedly crave. We make rules about keeping the marble stable, not moving the bowl and so forth.

Now take the same bowl and fill it with fruit suspended in Jell-O. If you take a fork and attempt to remove one of the pieces of fruit, everything moves. In Quantum physics that's called entanglement. In what Hyland calls Quantum economics that's Lehman brothers. We have come up with the term "too big to fail" to express the fact that we recognize that the consequences of a collapse of even one of our major financial institutions are incalculable. What we do know is that such a failure would have global consequences. The idea that "we are all connected" has transitioned from an esoteric mystical concept to an increasingly robust scientific theory to an economic reality.

It seems that the ongoing efforts at budgetary unity in the Eurozone reflect this new reality. I would suggest that it is a continued attempt to apply a moralistic set of rules to an ethical challenge. Economics is a discipline devoted to understanding how we relate to each other, what we think has value and how we interact with each other to enhance the human experience. Tragic

as it may appear to those who have elevated the left-brain to the highest form of human endeavor the rational mind is not up to the current task. Kahneman and Tversky's Prospect Theory has been telling us for some time that the rational mind does not determine how we behave; Taleb's Black Swan tells us that the rational mind is really only useful in describing retrospectively what has caught us completely by surprise. Our insistence on stability, he says simply creates greater instability.

Accepting that the environment has changed from classic to quantum raises an obvious question for those of us involved in the discipline of risk management; now what do we do? I would suggest that there are several useful actions that could be taken.

We need to reexamine our definition of risk. Prior to the last forty years risk was understood in the context of what an organization wanted to achieve. The origin of the word, Peter Bernstein tells us in *Against the Gods*, comes from the Old Italian *risicare*, which means, "to dare" (note that this is very different from "what negative events will occur if I do dare"). For most of human history, managing risk has always been about understanding what needs to go right rather than what might go wrong. Returning to this idea has some dramatic implications.

Warren Buffet put it very succinctly when he said, "Risk occurs when you don't know what you are doing." Risk in the context of organizational goals moves us away from the sets of rules outlined in methodologies and into the uncertainty of the operating environment. Here, we need to develop information about which risks must be embraced to execute the business strategy. The first step in this process is to ensure that there is wide dissemination of that strategy throughout the organization. While that sounds fundamental and obvious, there are many operational managers who identify with the businesses they support, but relatively few who really understand what they are actually trying to accomplish.

Once a strategy has been broadly disseminated, the legitimate authorities on whether a risk should that needs to be embraced are the operating managers themselves. This is a departure from what we have convinced ourselves our role should be. The new role is that of an information coordinator and facilitator who converges disparate perceptions of risk between operational groups and business functions. In that role, we must learn and understand the multiple languages spoken throughout an organization rather than insisting that everyone learn a new one. We need to bring the parties together and insist that everyone understand what they are getting into.

And this brings us back to how we feel. Operational and

business managers define risks based on their organizational responsibilities. Their perception is limited to the issues in their area of expertise. The role of the risk manager is to converge those perceptions so the entire organization understands the risks being accepted. To have a more useful impact, we must change the definition of risk management. Rather than position ourselves as the arbiters of what is and is not an acceptable risk we must understand that risk is experienced as a feeling rather than a rational thought. Emotion drives commerce. We start with an idea and we build a business driven by creative, non-linear passion; the spreadsheets come later.

It would also be helpful to make a clear distinction between compliance activities and risk management. Obeying the law is not an exercise in the management of uncertainty. While laws and regulations are implemented in an attempt to manage systemic risk, no individual entity or even group of entities can manage that risk.

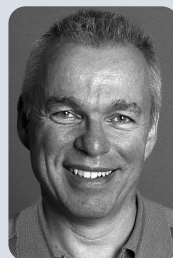
A good analogy here is the process of getting a license to operate an automobile. One has to pass a written test and then a road test. Completing those tasks is an act of compliance; it gets you the right to be on the highway but has no impact on where you go and how you get there. Risk managers are both those who develop the requirements and those charged with enforcing them. I am not suggesting that compliance is a trivial exercise, far from it given the complexity of our economic environment. It is a necessary activity, one that becomes eviscerated when we insist on confusing it with risk management in our organizations.

The role of risk management is tougher than our current job description. It requires a high degree of emotional intelligence, a comfort with ambiguity and a drive to assist the organization in maintaining coherence. The world is an uncertain place. In considering a piece of fruit in Hyman's Jell-O bowl we need to ask ourselves if it is more relevant to determine which direction you want to move in or attempt to determine where everything else is going to move. Hedge funds spend millions in an attempt to do the latter but they only need a sense of where the market will shift in the next three to five seconds. Insisting that we can do better is foolish.

We live in a time similar to the days prior to Galileo when the sun was thought to revolve around the earth. It is difficult for us to

grasp today what people were thinking back then and how much their worldview was battered by the increasing awareness that they were living on a planet orbiting the sun. I would suggest that we have been in a similar transition since Max Planck coined the term "quantum" over a hundred years ago. This new physics tell us that risk is more about understanding how you want to influence events rather than being influenced by them. Given our penchant in this profession for cataloging real and potential calamities redefining risk has a clear benefit. It results in a shorter list.

ABOUT THE AUTHOR



Bill Sharon has been a risk management consultant for the past 15 years. He has 25 years experience in the Financial Services and Marketing/Communications industry in a variety of "C" level positions and consultancies. The consistent thread throughout his career is a focus on streamlining operational environments in the service of the business strategy.

At JP Morgan as the COO of Corporate Real Estate, he was a key player in the transformation from a commercial bank to an investment bank through the development and construction of high tech offices in 23 markets that reflected the new organizational culture. He went on to develop cross-functional processes for penetrating new markets and establishing new products. He also created the first proactive operational risk management process designed as a vehicle to communicate opportunities as well as issues on a real time basis.

At Price Waterhouse, he established the North American Operational Risk Management practice that focused on the "upside" of risk — the choices an organization needs to make to stay competitive.

Bill holds a clinical degree and, for the first ten years of his professional life worked with adolescents in the South Bronx and East Harlem, an experience that taught him the very difficult skill of how to listen.

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Chapter leadership plans to make the chapter effective by:

- Coordinating with financial and educational institutes to conduct awareness programs for employees, students and the general public and working with stock exchanges, banks and financial institutions to increase awareness of organized risk management.
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- Spreading risk awareness through training workshops, seminars and conferences.

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To learn more about Lahore & Islamabad Chapter of PRMIA, please visit www.prmia.org/Chapter_Pages/Lahore-Islamabad or email us at: lahore_islamabad@prmia.org.



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As the CEO of Syscomp International Ltd., **Suhail Iqbal** specializes in information technology and management consulting. Suhail holds international certifications including PgMP, PMP, PMI-RMP, PMI-SP, MCT and PRINCE2 Practitioner and is an authority in Project Risk Management. He is a faculty member at SZABIST, CASE, Air University. His expertise includes Organizational Management, Portfolio, Program and Project Management.



Abdul Rafay; FCA, is founding Co-Regional Director of PRMIA Lahore Islamabad Chapter. A Chartered Accountant by profession, he is a member & charter holder in various national & international professional bodies. He has 15 years professional experience and 18 years academic experience and has provided professional services in a range of sectors including textile, auto assembly, footwear, industrial and agricultural chemicals, ice cream and dairy, glass & ceramics, healthcare, mining & natural resources, paper sacking, steel & pipe casting, rice processing, brokerage & co-operative finance, software development, real estate, printing & publishing, construction & civil engineering and others. He is also affiliated with the University of Management & Technology (UMT) in Lahore as an Associate Professor & Chairperson of the Department of Finance in School of Business & Economics.



Fahad Zafar is a European trained professional and founding Co-Regional Director of PRMIA Lahore Islamabad Chapter, most recently working as Chief Risk Officer for a commercial bank. He has rich experience in developing and implementing risk management frameworks aligning with Basel II & other regulatory guidelines. He holds various degrees including a BSc (Hons) from Middlesex University (London, UK) and an MBA from Bradford University (Yorkshire, UK).

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Research from the Centre has received recognition world-wide, with papers published in the *Journal of Risk* (2002) and selected for inclusion in leading books on risk management and analysis, including *'Innovations in Risk Management: Seminal Papers from the Journal of Risk'* (ed. Philippe Jorion, University of California at Irvine) and *'The Value-at-Risk Reference: Key Issues in the Implementation of Market Risk'* (ed. Jon Danielsson, London Business School). At the same time, the Centre's relationships with financial services firms mean research projects with commercial opportunities receive attention and support for implementation. Currently, the *Ultimate Alpha* system assists large fund managers analyse the performance of their investment strategies and evaluate the performance of brokers executing their trading instructions.

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ABOUT THE AUTHOR



Prof. Riaan De Jongh (Director of the Centre for BMI at North-West University) holds a PhD from the University of Cape Town, a MSc from the University of South Africa and a BCom from the University of Stellenbosch. Articles authored or co-authored by Riaan have been published in internationally peer-reviewed journals. In 1995, he received the Tom Rozwadowski medal for the best contribution to Operational Research in South Africa by a member of the Operations Research Society of South Africa. In 2000 he served as President of the South African Statistical Association (SASA). An elected Fellow of SASA (2001), he received the Sichel medal (along with J.H. Venter) for the best paper in Statistics by a member of SASA (2005). Currently he is a member of PRMIA

University Programme Accreditation Committee, PRMIA Research Subcommittee, and the Council of ISBIS. For the last 4 years he has served as trustee on the Board of the NWU Pension Fund. His past experience also includes time working for Deloitte Consulting and a local engineering consulting firm.

**CAROL ALEXANDER**

Chair of Financial Risk Management
ICMA Centre, Henley Business
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PRMIA Involvement

- Former member, Education Committee
- Co-Editor, PRM Handbook
- Former Chair, Academic Advisory Committee
- 2006 Higher Standard Award

Term Expiration: 2012

**DOMINIK DERSCH**

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Dominik Dersch Beratung

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- Member, Global Council of Regional Directors
- Member, EMEA Regional Director Committee
- 2005 PRM Focus Award Winner
- 2007 PRM Candidate of the Year Finalist

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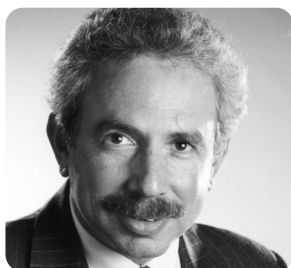
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- Former Vice-Chair, Executive Committee
- Former Chair and Founder PRMIA Blue Ribbon Panel

Term Expiration: 2014

**BUD HASLETT**

Executive Director, Research Foundation
and Head, Risk Management and
Derivatives, CFA Institute

PRMIA Involvement

- Member, Finance Committee

Term Expiration: 2012

**COLIN LAWRENCE**

Director, Risk Specialists Division,
Financial Services Authority (FSA)
Visiting Professor, Risk Management,
Cass Business School

PRMIA Involvement

- Steering Committee, London Chapter
- Vice Chair, Executive Committee
- Member, Ethics and Professional Standards Committee

Term Expiration: 2012

**SHAUN BOND**

Chief Risk Officer,
Bank of Montreal, Beijing

Term Expiration: 2014

**CHAE SING, WONG**

Senior Vice President/Head of Asia
Business Risk Management, Marsh

Term Expiration: 2013

**BARRY SCHACHTER**

Director, PRMIA

PRMIA Involvement

- Education Committee
- Co-Chair, Publications Committee

Term Expiration: 2013

PRMIA was established in 2002 by risk industry professionals sharing a vision of a new association anchored in ethical guidelines, transparency and testing standards, that was capable of providing courses and publications better than anything available to the risk profession, while maintaining commitment to non-profit ideals of service. Here are those individuals.



EMERICO AMARI
Senior Partner, MACFIN Group
Management Consultants



FRED AU
Principal, Risk Partner



JEAN-MARTIN AUSSANT
Député, Assemblée nationale
du Québec



JOHN PAUL BROUSSARD
Associate Professor, Rutgers
School of Business – Camden



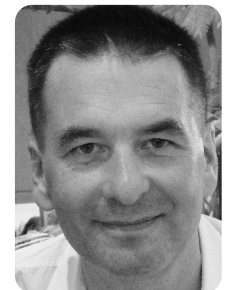
MICHEL CROUHY
Head of Research and
Development at NATIXIS
French Investment Bank



DAN GALAI
Dean, The School of Business
Administration, The Hebrew
University, Jerusalem Israel



FRANK HAYDEN
Principle, Risk and Decision



KRUSKAL HEWITT
Senior Advisor, Risk
Management, J-Power



GEOFF KATES
CEO, Lepus



DAVID R. KOENIG
Chief Executive Officer, The
Governance Fund Advisors, LLC
and Chief Investment Officer,
Ram Investment Advisors, LLC



ANDRZEJ KULIK
Head of Internal Audit Dept.,
BRE Bank



DARREN LANGER
Head of Portfolio Management,
Tyndall AM

NOT PICTURED

SERGIO BENAVENTE
Deputy Superintendent of Banks,
Superintendency of Banks, Chile

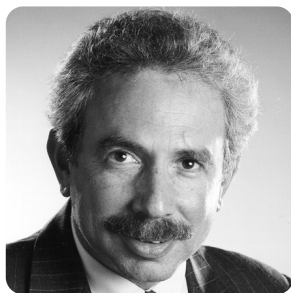
KENJI FUJII

DAVID GREEN
Managing Director, Angel
Oak Advisory Services

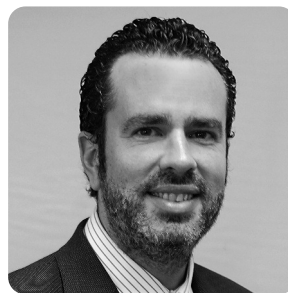
PHILIP MERRILL
Principal, Sagacious LLC



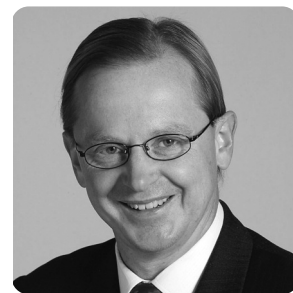
PHANG HONG LIM
Group Chief Risk Officer,
CIMB Banking Group



ROBERT MARK
Managing Partner and
Chief Executive Officer,
Black Diamond Risk



DANIEL OTERO
Chief Risk Officer,
Centro Financiero BHD



SOREN PLESNER
CEO and Founding Partner,
BASISPOINT



DAN ROSEN
CEO, R² Financial Technologies



NAWAL ROY
Associate Principal,
McKinsey & Company



SETH SHAPIRO
Senior Vice President and Risk
Strategist, Kibble and Prentice/USI



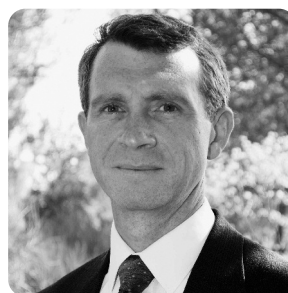
ALEXANDER SHIPILOV
VP, Risk & Capital Audit,
TD Bank Group



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Higher School of Economics,
Financial Engineering and Risk
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Management and Insurance, Higher
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LARS SODERLIND
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ZVI WIENER
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DEBBIE WILLIAMS
Vice President, Market Strategy,
R² Financial Technologies

TOM TRAUB
SVP, Enterprise Credit Risk,
Bank of America

You can find details about our founders at
<http://prmia.org/index.php?page=aboutus&option=aboutusFounders>