

Financial Stability

Success takes off in the convoluted regulatory environment

a Whitepaper on

Basel Capital Adequacy ♦

BCBS 239 Aggregation ♦

CCAR/ DFAST/ TLAC ♦

DMAIC approach to ♦

Dodd-Frank Volcker Rule Compliance



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Introduction

Some in the industry consider the Volcker Rule backstop provision as being overkill. It is insane to ask banks to assure for everything that "may become a threat" to the U.S. financial stability. Many indeed believe the provision is merely a "spirit of the law" rather than anything being enforceable. In fact, law makers and supervisory bodies keep introducing new regulations and guidance that are hard to understand. Kudos to those who, on a daily basis, are combating with the requirements of the Volcker Rule, Comprehensive Capital Analysis and Review (CCAR), Dodd-Frank Act Stress Testing (DFAST), Total Loss Absorbing Capacity (TLAC), BCBS 239, Basel III and more. The question is, how can the industry stay on top of all these requirements, and actually do something meaningful to improve the risk and compliance controls?!

In this whitepaper, we are going to make sense of these regulatory requirements with big picture perspective. Also, we'll showcase a roadmap on how the industry can follow a Six-Sigma DMAIC approach to achieve a better state of risk and compliance controls, which in turn will prevent another financial crisis (i.e. fostering financial stability).



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Basel Accord

Beyond Capital Adequacy

Capital adequacy ratio is a fundamental measurement to gauge whether the bank's capital is sufficient against their risk weighted exposures. Too little capital may induce moral hazard problems that are detrimental to depositors and the overall safety of the financial systems. The general idea of the Basel requirement is: the more speculative nature of the bank's activities, the higher the risk weighting it will have towards requiring additional capital.

Basel is trying to hold banks accountable for their own risks, whereas policy makers of the Volcker Rule (VR) thinks proprietary trading activities are too risky and speculative for banks to handle, hence totally abolishing it. We expect policy makers will continue to use capital adequacy to regulate the market, despite the elimination of

proprietary trading by VR. We are not commenting whether the current capital requirement is too much, too little, or will it ever be perfected with the continuous jiggling of the capital requirements for Basel VI, V, IV ... etc. We just hope no one would be naïve in thinking that capital adequacy will solve all the industry's problems.

Capital is a buffer in case anything adverse happens. It is also an immediate cost to discourage activities. Indeed, financial stability requires much more than capital adequacy. It requires healthy activities in the market. Please see later sections where we will elaborate the discussions on how a DMAIC approach can improve the industry's risk and compliance controls and foster healthy activities in the market to promote financial stability.



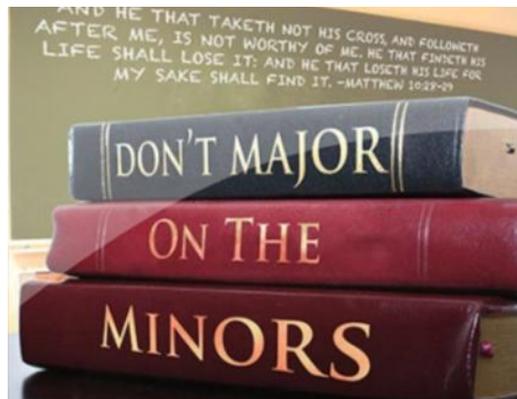
BCBS 239

Major in the Major

With reference to [BIS progress report](#), it shows that banks are better at risk reporting practices while failing to attain the goals of risk data aggregation capabilities. We feel this is contrary to common sense (i.e. risk report supposed to be a by-product of a robust enterprise risk management system). **Silos, manual reports, and “everybody owns = nobody owns”** are the key attributes causing this chaotic situations. Yet we wonder: why all the scrambling to prepare so much information? Are all these reports prepared just for the sake of regulatory filings? What purposes are the various risk data being collected for? Should the major focus be on the vital few key risk indicators (KRIs) and

real-time risk analytics?

Risk metrics and compliance reports are useful when they serve as KRIs to guide management actions. However, creating piles of documents without the substance of enhancing risk and compliance controls would only benefit the law firms and consultants. Too often we see disproportionately large resources assigned to documentations and not enough manpower to improve risk, product, and/or trading desk controls. We felt particularly perturbed by news stating that



many have submitted over 10,000 pages of documents just for the ‘living wills’ requirement, and end-up still being rejected. In our opinion, JP Morgan stepped up to take over Bear Stearns during the crisis has been the best illustration of an orderly wind down of a big investment bank. **By having more banks build up their capital market risk management capabilities and more healthy activities in the market, that’s the way to foster financial stability.** And in case of stress situations, these banks would be more ready to absorb hit or even step-up to help or acquire troubled peers.

Our point here is **focus on concrete actions to improve risk controls instead of blindly poking around** for BCBS 239 and any other compliance projects out of fear. Then you’ll see the logical

priority in having a robust enterprise risk management system first before filling in the ancillary risk reporting capabilities. Since VR specifically call for “a system of internal control reasonably designed to monitor compliance with and to prevent the occurrence of activities or investments prohibited by the regulations”, therefore you need to give VR the number one priority. If you are not giving VR the necessary priority, how are you going to qualify for the exemptions in continuing the daily trade activities?! Besides, we live in a dynamic market, and manually compiled risk analytics would be too late to catch those lightning speed crisis situations. Huge losses can be accumulated at a matter of a few seconds. **To truly address practical risk concerns, you only need the vital-few intelligence at the right time!**

A good decision, made
now & pursued
aggressively, is
substantially superior
than a perfect decision
made too late.

Courageous Leadership Podcast

Episode 17



CCAR/ DFAST/ TLAC

Turn Stress into Success

First and foremost, we encourage those who are not subjected to these requirements to still be familiar with the Federal Reserve's latest stress test scenarios (click [here](#) to see the publication). Reviewing it would be helpful for you to **better assess the implications of these rules on the market and how it would ultimately affect your business when the overall market shake.**

The purpose of capital review, stress testing, and scrutiny on loss absorbing capacity is similar to the Basel Accord (i.e. use capital adequacy to regulate the market). Just that these requirements put more emphasis on “hope for the best, plan for the worst”. So, there are heightened attention on risks and additional burden on compliance reporting as we have discussed the challenges earlier in

the BCBS 239 section. At this point, however, let's see if there is anything good to pull out from these hard efforts.

Categorizing immovable assets, determining large exposures, liquidity coverage, stable fund, leverage ratio, and asset encumbrance are **useful parameters to establish basis for your VR - Reasonable Expected Near-Term Demand (RENTD) under different market scenarios.** Also, market shocks such as the likelihood of a U.S. deep recession, significant decline in asset prices and increases in risk premia, slowdown in the Global economy, a Global shock on large trading, derivative position, etc. would entail a different RENTD forecast to cope with the change in market conditions. Thankfully, when

you are planning for these adverse scenarios for CCAR/ DFAST/ TLAC, you are doing a big favor for your Volcker compliance team in gauging RENTD beyond the baseline scenario.

Furthermore, your methods to measure securities financing transactions, off-balance sheet commitments, and counterparty credit risk for OTC derivatives would have an impact to the allowable aggregated risk exposure you can have according to [BCBS 283](#). Remember, **all these are interrelated**, and the VR Backstop provision does require you to measure and control large exposures.

Define / Determine

DMAIC approach to financial stability

In six-sigma, “D” is to clearly define your problem. In the context of risk and compliance management, we refer to this as the step **to determine what allowable risks to take; how much risk to take; and also defining the risk and compliance controls right from the get-go** (a best practice to embed controls into the design early-on).

Risk and compliance functions need to be involved whenever new products, processes, or hedging strategies are introduced. The audit team may also have a stake here to consider building in the appropriate audit trails. All product release notes should include a risk section to describe how risks are addressed. Algorithms need appropriate back testing and circuit breakers to prevent unexpected

outcomes. Predefined risk triggers/cap-limits may help contain certain situations. Proper endorsement by the risk and compliance team is necessary before any new product or strategy goes live. In addition, there should be workflow procedures to define who to inform, who to consult, and who has the responsibilities and the ultimate accountabilities in case anything adverse happens.

Such risk governance policies and best practices aren't totally bullet proof. New product reviews are often done on a case-by-case basis. New product may look fine on a standalone

basis, but what if someone is trying to game the system? **All hell breaks loose when several approved products are orchestrated together to synthetically create trades that would otherwise be prohibited.** Also, please be reminded again that losses can be accumulated at lightning speed. Therefore, we need the next step “M” to monitor and prevent crooks from slipping through the cracks.



Winning at the Starting Lines



Monitor / Measure

DMAIC approach to financial stability

The best risk and compliance professionals will still fail if they aren't equipped properly. Simply look at the artificial intelligence and machine learning algorithms used by the front-office, the reality is algorithmic trading won't go away and things could happen at lightning speed. How can risk and compliance professionals catch situations before they turn into a crisis? **It's just humanly impossible for risk and compliance officers to manually monitor millions of trades in real-time.** The industry needs to go beyond after-the-fact investigations and adopt systems for real-time preventive risk management.

In addition to real-time monitoring for active risk prevention, financial

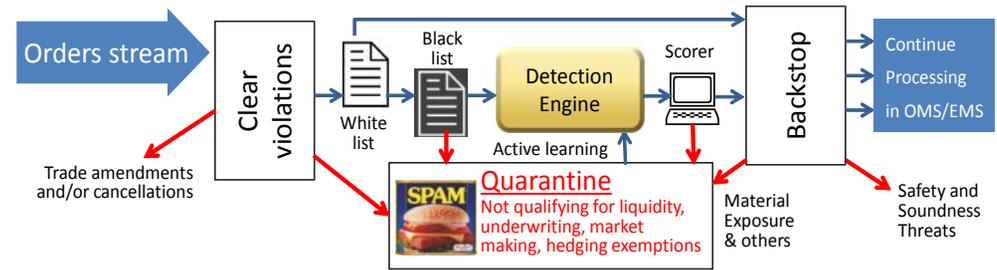
institutions should measure and scan the market, gauge their clients, customers, and counterparties' needs, as well as the supply and demand of different instruments. There ought to be continuous assessment of changing dynamics (e.g. maker-taker model versus trade execution quality, arbitrage versus market making, meaningful quoting, demand of liquidity timing, rebalancing, etc.). Other measurements include the appropriate accounting of instruments turnover rate, periodic review on reliability of securities supply, check for deterioration or losses in accrual loan portfolio, etc. All these measurements will

help substantiate a meaningful RENTD for VR compliance.

A quick reminder: one-off inventory review exercise won't do you any good because you need constant reforecast to update your securities inventory plan according to changing market dynamics and/or event-driven conditions. **You can't practically base everything on a one-off historical projection for what should be the right level of trade activities of today.** If you do, you may as well staple all the psychic readings from your fortune cookies as your securities inventory plan. We doubt the regulators would be happy with it.

Advanced Analytics

DMAIC Approach to Financial Stability



A true demand forecast can't go without advanced analytics. Specifically, it needs to perform scenario planning for the right amount of trades at the right time. It involves comprehensive analysis of both stochastic and deterministic factors for RENTD. **Those who tell you to go about collecting historical data for future projection are only telling you half the story. The past does not necessarily predict the future.** There are event driven algorithms you need to consider, especially for the equity market. **You have got to look at the order imbalances, liquidity shocks, market sentiment, and much more.**

You can't simply apply a

haircut approach to refrain from carrying securities over sixty days. Borrowing an analogy from the shoe business, size eighteen or above shoes may be infrequently purchased, but there are bound to be clients with genuine demand for these oversized shoes. This is particularly true in the fixed income market with occasional demand for infrequently traded products. We don't want to turn down people with size eighteen or above feet to walk without shoes. Equally, we shouldn't dry up market liquidity, so long as the trade intents are not for speculative purposes that violate VR proprietary trading ban.

Nevertheless, there are over fifty shades of grey in discerning between prohibited versus

permitted market making, hedging, underwriting, and liquidity management activities. Your system has to be **as robust as your email spam filter to recognize patterns and qualify for the appropriate exemptions.** It'll be Armageddon if you don't get any exemptions because the rule states that you are "guilty until proven otherwise". Therefore, your active risk monitoring system needs the breath for holistic oversight of all trades in real-time, and also the depth of advance analytics to run rigorous tests behind the scene. Naturally, you'll want the system's frontend interface to have robust workflow alert functionalities and be as friendly as your email spam filter.



Iterative Improvements

DMAIC approach to financial stability

Demand may sometimes be off target from the RENTD forecast. No one likes to be stuck with unsold assets. **Every missed target experience should turn into lessons learnt. But hold on, there may be bigger market implications if all banks conclude to tighten liquidity as a result of this!**

Instead of being upset about occasional bad forecasts, focus on the design and iterative improvements of the RENTD model. Your fine tuning of the forecast algorithms should reflect your bank expertise in the selected markets. Also, you need dynamic reforecast to reflect market changes.

In terms of the filtering mechanism to discern permissible versus prohibited activities, risk and compliance officers are bound to have human bias and can be inconsistent. **You should**

consider the use of machine learning to augment the limitations of humans who may be scattered and slow. It analyzes massive amounts of data superfast and has the ability to learn quickly, as well as apply judgements consistently.

Think about combining the best talents with machine learning for an iterative complex event monitoring system. This big data approach to risk management is all doable technically. It just requires the appropriate infrastructure to maximize the effectiveness in benefiting all participants in the network that use this industry utility. Crowd collective intelligence is powerful to win the race over rogue traders.

Comprehensive Controls

DMAIC approach to financial stability

The backstop provision of VR is like a catch-all clause that allows regulators to step in anytime if anything "may become a threat" to the U.S. financial stability. Some treat it merely as the "spirit of the law" to tell them not to do anything stupid with taxpayers' and/or depositors' money. They don't think this provision will ever be enforceable. However, **the supervisory expectations are more realistic than you may think**, and it is calling for all banks to take comprehensive protection immediately.

We urge everyone to get familiar with these supervisory frameworks ([OFR: Analyzing Threats to Financial Stability](#); [FSOC: Framework to Mitigate Systemic Risk](#); [BCBS 283: Measuring and Controlling Large Exposures](#)) and

not treat this backstop final quality assurance check lightly. Here are some practical implementation suggestions for you:

- **Determine** percentages of your individual non-bank counterparty **exposure and bank CET1 or Tier 1 capital which can be considered materially excessive**;

- Use a system to **detect if permissible trades** (e.g. repos, securities loans) **may synthetically be combined to become prohibited activities** before execution;
- **Use a system to curb possible market manipulations.**



Last but not least, OFR already provided hints regarding their concerns (or areas that regulators are going to scrutinize) as per their latest annual report - "(1) excessive risk-taking and positioning; (2) market structure and liquidity issues; (3) the migration of activities due to financial innovation and regulatory arbitrage". Also, **OFR has laid out risk indicators bluntly for the industry to follow. See next page** for an extraction of Figure 2-6 of the OFR annual report regarding risk indicators.

<i>Risk</i>	<i>Definition</i>	<i>Indicators</i>
<i>Macro-economic</i>	<i>Evaluates risks that have the potential to affect financial stability through various macro channels such as growth, external balances, fiscal vulnerabilities, and confidence channels.</i>	<i>Financial conditions, output gap, sovereign debt levels and financing costs, foreign exchange reserves, current account balances, consumer and business confidence, inflation volatility, and inflation expectations</i>
<i>Market</i>	<i>Assesses the risk of destabilizing losses across key asset classes and investment strategies as a result of adverse movements in asset prices.</i>	<i>Duration, positioning, risk premiums valuations, and volatility</i>
<i>Credit</i>	<i>Measures the propensity of a counterparty to meet its financial obligations, and includes market-implied and balance-sheet measures of risk.</i>	<i>Corporate credit spreads, balance-sheet leverage, lending conditions, delinquencies, asset quality of households, corporates, banks, and nonbank financial institutions</i>
<i>Funding/ liquidity</i>	<i>Captures market liquidity, balance-sheet liquidity ratios, stress in funding markets, and the potential for vulnerabilities that arise from excessive leverage.</i>	<i>Broker-dealer inventories, turnover, volume, cash balances, dependence on wholesale funding, changes in short-term investor assets under management and tenors, foreign exchange basis swaps, short-term funding rates/spreads</i>
<i>Contagion</i>	<i>Measures the vulnerability of the financial system to sudden shocks that may spread as a result of interconnectedness.</i>	<i>Contingent claims analysis, conditional value at risk, systemic expected shortfall, distressed insurance premium, network analysis, cross-border exposures, sovereign-bank exposures, correlation risk</i>

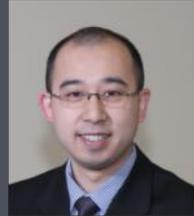
Conclusion

In conclusion, financial stability is a joint responsibility of the policy makers, regulators, and the industry. **No risk is fully mitigated and no end to the regulatory demand of more controls. It's a race to stop the prohibited before the violators stop you.** A lot still needs to be done before the industry is ready with a preventive system to monitor and enforce the compliance. We have laid out the roadmap for the industry, now it is the time to institutionalize the solution. FIs and regulators need to **engage the pioneer to implement this utility model. Together, we'll win the race over rogue traders and achieve an improved state of financial stability.**

Additional Research Suggestions:

The Office of Financial Research has been working on agent-based models for analyzing threats to financial stability. It will be interesting to see how this will contribute to the prediction of the next Wall Street disaster, or be a flex of subpoena power to collect too much information. Also, NMS and CAT 613 are hot topics to follow. We are concerned about the proposed ring-fencing rule (UK version of the Volcker Rule). It may hinder development of risk and compliance controls if it disintegrates FIs' ability to run global based system to holistically access risks across asset classes and trading desks that are outside of the ring-fence. We'll continue to observe the regulatory environment to see how all these will play out for the benefit of achieving an improved state of financial stability.

About the Authors



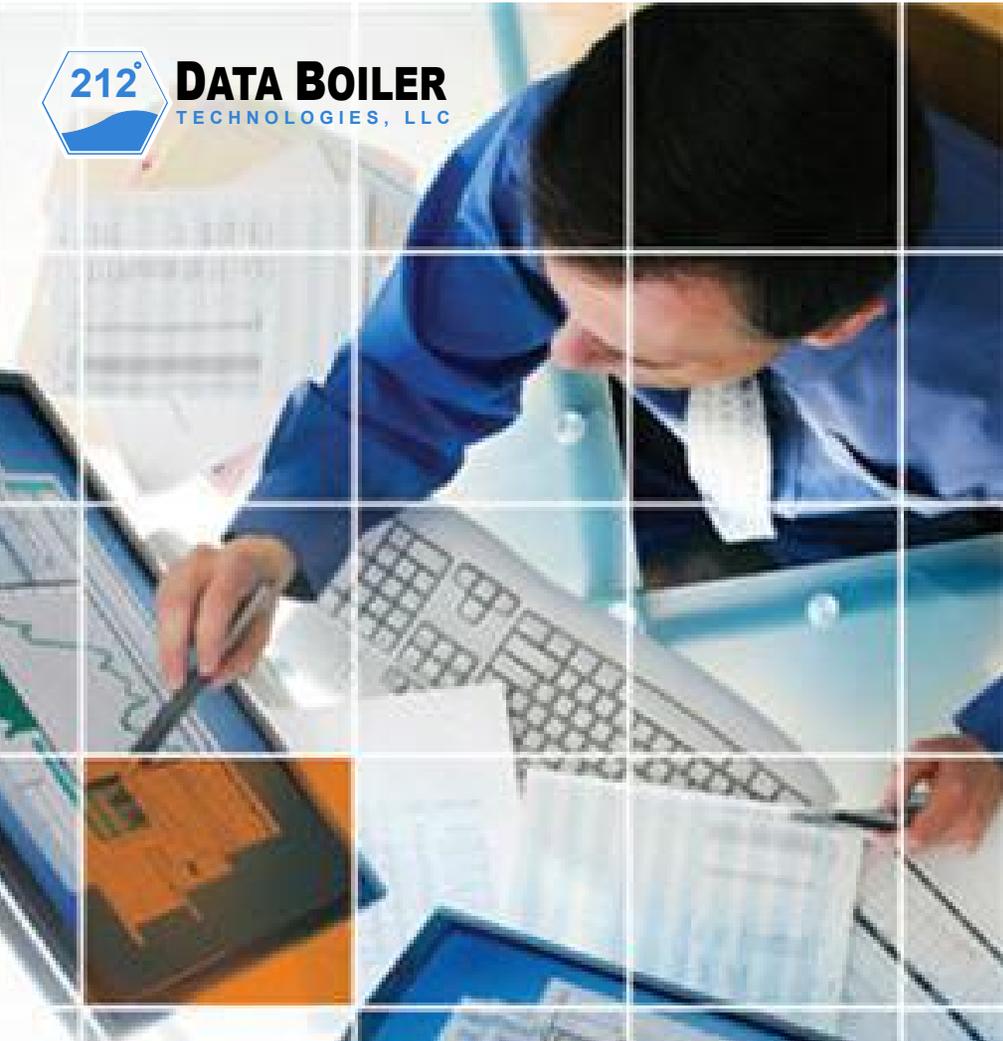
Kelvin To
Founder and President
Data Boiler
Technologies, LLC

A FinTech Person of the Year nominee, over 20 years of experience in strategic planning and corporate development with a strong emphasis on Business Modeling and LEAN Six Sigma. Kelvin has proven success at Citigroup in formulating a 500+% growth model by leveraging Big Data analytics. Prior to his current role, he was VP for Broadridge, Functional Head for Citigroup, subject matter expert in corporate finance for the Institute of Bankers, and also lecturer for various professional organizations. Kelvin holds a MSc degree in Banking from City University, a Master of Management from Macquarie Graduate School, and a BSc degree in Accountancy from Bentley University.



Homer Cheng
Chief Technology Officer
Data Boiler
Technologies, LLC

Homer has over 20+ years of experience in the investment banking industry. During his tenure as Executive Director at Goldman Sachs, he managed business critical applications and was part of the global management team for Investment Banking Technology. He is known for his collaborative skills to partner with the business and other technology teams in delivering practical solutions with concrete results. His areas of expertise include trade analytics, risk management, compliance and operations systems development and implementation. Homer is based in California and holds a Masters of Engineering degree from Cornell University.



www.DataBoiler.com

ContactUs

Phone: 617.237.6111

Email: info@databoiler.com

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At Data Boiler, we solve data management problems, augments product development efforts, lead big data project, and provide other solutions and services. By seeing big and boiling all the puzzle pieces together in the convoluted financial market, you will be eased from silos and other data challenges. This will enable better risk and compliance controls for a sustainable growth of your business.

VR Machine is our flagship product for the Volcker Rule compliance, a patent pending utility to spam filtering the prohibited. It helps you determine the reasonable expected near-term demand (RENTD) and qualify for the appropriate exemptions.

We are fit-for-purpose in applying big data technologies, such as using machine learning techniques for complex event monitoring, leveraging semantic database for LEI/IBOR/ reference data solutions and other predictive models. Our ideas are boiling hot at **212°** - the extra degree to make a difference.