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THE VOLCKER RULE
Back to the Future

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THE VOLCKER RULE

Back to the Future

The financial crises of 2008 highlighted once again how regulatory regimes have moved in cycles over the years, allowing firms to apply regulatory arbitrage, or to take advantage of lax controls. Going back to the post-depression reforms of the '30s, regulators in the US and Europe recognised the need to reduce firms' excessive risk taking, and to maintain a stable banking system as a foundation for stable and predictable economic growth. The Glass Steagall act of 1932 was the US's attempt to separate commercial activities from the more risky investment activities. Through a combination of banking competition, politics, lobbying and the development of financial products that blurred the lines of securities and commercial lending, through the 60's and 70's and in more modern times the act was whittled down until its eventual repeal in 1999.

Deregulation in the finance sector during the conservative era of the 80's helped to more efficiently distribute capital to financial firms, corporations and households. Even through this period, the finance sector was one of the most heavily regulated in the corporate sector. The root cause of the crises can be traced more to a mis-regulaton and activist government policies rather than a lack of regulation altogether. Freddie Mac and Fannie Mae's loose lending policies, which led to the degradation of credit standards across the mortgage industry, the destruction of home ownership, and the introduction of the term 'sub-prime' to the lexicon, was the main contributor to the recent crisis.

This paper describes the latest attempt at further regulation and the re-introduction of Glass-Steagall like policies dealing with the prohibition on proprietary trading and risky activities.

VOLCKER TESTIMONY

Testifying before the Senate Committee on Banking, Housing, and Urban Affairs on February 2,2010, Chairman Paul Volcker urged the committee to prevent commercial banking institutions, beneficiaries of taxpayer-subsidized deposit insurance and emergency liquidity, from continuing to engage in sponsoring and investing in hedge funds and private equity funds and "trading unrelated to customer needs and continuing banking relationships." These activities he identified as 'essentially proprietary and speculative activities'"(1) He believed there were means available to eliminate speculative proprietary trading not only due to institutional risk but also to avoid conflict of interest. It should be noted that Volcker described "proprietary trading", at least in any sizeable volume as being conducted by only "a handful of large commercial banks".

The final "Volcker Rule"(2) requirement of section 13 of the Bank Holding Act was issued December 10, 2013, by the addition of section 619 of the Dodd-Frank Wall Street Reform and Consumer Protection act, and released collectively by the Federal Reserve Board (FRB), the Federal Deposit Insurance Corporation (FDIC), the Comptroller of the Currency (OCC), and the Commodity Futures Trading Commission (CFTC). The Volcker Rule becomes effective April 1, 2014 and the compliance deadline is July 21, 2015. Section 619 is titled "Prohibitions on proprietary trading and certain relationships with hedge funds and private equity funds".

The U.S. Financial Crisis Inquiry Report of 2011(3) states that "we conclude dramatic failures of corporate governance and risk management at many systemically important financial institutions were a key cause of the crisis". Adequate information about the risks in this market was not available to market participants or government regulators like the Federal Reserve. Because the market had been deregulated by statute in 2000, market participants were not subject to reporting or disclosure requirements and no government agency had oversight responsibility.

Financial institutions were permitted to grow uncontrolled, with the amount of debt held by this sector soaring from $3Tr in 1978 to $36Tr in 2007. As of 2007, the five major investment banks – Bear Stearns, Goldman Sachs, Lehman Brothers, Merrill Lynch and Morgan Stanley were operating leverage ratios as high as 40 to 1. In December 2007, credit derivatives had reached a height of $58.2 trillion in notional amount. According to the Financial Crisis Inquiry Report "before it [the crises] was over, taxpayers had committed trillions of dollars through more than two dozen extraordinary programs to stabilize the financial system and to prop up the nation's largest financial institutions". At the height of the crisis 5 major events took place within a week (Figure 1).

FIGURE 1. HEIGHT OF FINANCIAL CRISIS SEPTEMBER 2008

SEPTEMBER 15, 2008
Lehman Bankruptcy

SEPTEMBER 15, 2008
Bank of America takeover of Merrill Lynch announced at same time as Lehman's Bankruptcy

SEPTEMBER 16, 2008
AIG rescued 24 hours later.

SEPTEMBER 18, 2008
Treasury announces $700bn Tarp Program

SEPTEMBER 21, 2008
Goldman Sachs & Morgan Stanley become bank holding companies

The Financial Crisis Inquiry Report concludes that "the failures of credit rating agencies were essential cogs in the wheel of financial destruction. The three credit rating agencies, [Moody's, Standard & Poor's (S&P), and Fitch] were key enablers of the financial meltdown." The financial engineering behind the securitizations made them harder to understand. In order to determine likely returns, the probabilities that certain types of mortgages might default, and the amount of revenue lost on default, and the effect on tranches, investors relied on the credit rating agencies. With banks ready to divest risk, securities firms looking for fees, and rating agencies wanting to expand, the securitization market exploded. Volcker argued that speculative activity played a role in the financial crisis. Subparts B and C are meant to prevent this type of activity.

SUBPART B (PROPRIETARY FUNDS)

Proprietary funds prohibits banking entities, i.e. any insured depository institution, plus any company that is treated as a bank-holding company for purposes of section 8 of the International Banking Act of 1978, and which includes the US Operations of foreign banks, from engaging in proprietary trading. Proprietary trading means engaging as principal for the trading account of the banking entity in any purchase or sale of financial instruments. Exclusions include market making on behalf of clients. However, a trading desk or other organizational unit of another banking entity is in general, not a customer, thereby interbank trading is diminished. Risk-mitigating hedging activities are permitted provided that the strategies demonstrably reduce the risks being hedged and do not give rise to any significant new or additional risk. Securities purchased or sold for liquidity management are permitted if consistent with near-term funding needs and do not give rise to appreciable profits or losses.

SUBPART C (COVERED FUNDS)

Covered Funds prohibits banking entities from acquiring or retaining an ownership interest in and having certain relationships with a covered fund. This is intended to prevent a banking entity from accomplishing indirectly through a covered fund, proprietary trading which is prohibited under Subpart B. Covered funds include hedge and private equity funds, certain foreign funds and commodity pools. Of special interest are Special Purpose Vehicles (SPV's) which banks have widely used to effect securitization, that is, the process of moving assets off of the bank's books for capital mitigation and other purposes, and where a relationship exists with SPV. The Covered Fund definition will pick up many types of SPV's.

EXCLUSIONS exist where SPV's may avoid treatment as a Covered Fund. However, in order for the SPV to be acceptable, asset-backed securities (ABS) in the SPV cannot themselves be securities or derivatives. Loans and other receivables must be held directly. A synthetic exposure, e.g. through a CDS or tranche of another loan securitization is not allowed. Most CLOs (Collateralized Loan Obligations), since they typically contain bond buckets, CDOs (Collateralised Debt Obligation), CLNs (Credit Linked Note), Asset Swaps (ASW), Total Return Swaps (TRS), and any other structure that includes bonds and other securities are not permitted in order for an SPV to be excluded as a Covered Fund.

EARLY REACTION: During the five weeks since the ruling, 7 of 11 CLOs issued excluded bonds from their collateral pool(5), in order to comply with the Volcker rule. CLOs sometimes include bonds and other securities to help boost returns for investors. In another development, the ABA said in a complaint that due to the lack of clarity over CDC/trust Preferred Securities, that the Rule's ban "will impact over 275 banks and cause an estimated $600 million in capital to vanish overnight".

THE GLASS-STEAGALL ACT

Introduced in 1933, in the aftermath of the Great Depression, was intended to prevent banks from trading with depositor funds. The Act separated commercial banking from investment banking. The FDIC was formed at the same time to protect depositors against bank runs. The Regulation capped depositor interest rates and the combined effect prevented banks and thrifts from being able to compete with the investment banks and money market providers, or the shadow banking system.

An external factor, the 1973 Middle East War, drove up oil prices and inflation. Subsequent tightening resulted in the Savings and Loan (S&L) crisis, where almost 3000 commercial banks and thrifts failed in the 80's and 90's. The impact of interest rates was also felt in the heavily indebted oil and gas sector, especially among the Latin American sovereigns and through the failure of Continental Illinois The U.S. stock market crash of 1987 was most likely due to the same interest rate environment.

During the 80's, banks began to engage in interest rate derivatives. The OCC(4) (Comptroller of the Currency) was enthusiastically supportive of the development of sophisticated management techniques, and through 1983 to 1994 broadened the range of derivatives banks could use. In 1999 the Glass-Steagall Act was partially repealed by the Gramm-Leach-Billey Act. This Act also known as the Financial Services Modernization Act of 1999 removed barriers that prohibited any one institution from acting as an investment bank or a commercial bank.

THE BASEL ACCORD

The Basel Committee, a group of the G-10 nations was formed in late 1974 in response to the Herstatt Bank failure in the same year, and through the 1988 Basel Accord, a framework for capital adequacy was progressively introduced. The Accord was based on capital charges of overly simplified credit categories leading banks to engage in financial arbitrage through the use of new credit instruments where banks securitized their assets and removed them from the balance sheet. These instruments provided enhanced yields, however, the risk was little understood.

The Basel Accord is split into three pillars:

PILLAR 1 – MINIMUM CAPITAL

The maintenance of a capital base in order to ensure the institution has enough equity to withstand shocks to its banking and trading books.

PILLAR 2 – SUPERVISORY REVIEW

The ICAAP process giving regulators better tools to supervise institutions.

PILLAR 3 – MARKET DISCIPLINE

Reports and Information to give the institution greater transparency externally for investors, analysts, customers, rating agencies and other banks.

Five federal agencies on January 14, 2014, approved an interim final rule to permit banking entities to retain interests in certain collateralized debt obligations(6) backed primarily by trust preferred securities (TruPS CDOs) from the investment prohibitions of section 619 of the Dodd-Frank Wall Street Reform and Consumer Protection Act, known as the Volcker rule.

CULTURE OF COMPLIANCE: A requirement of the Volcker Rule is that a culture of compliance must exist with annual reports by senior management to the Board on effectiveness of the compliance program, and attestation by the CEO in writing that the banking entity has in place reasonable processes to achieve compliance. On an ongoing basis, banking entities must carefully monitor and evaluate all quantitative measurements. A measurement that indicates a heightened risk of impermissible proprietary trading, or a material exposure to high-risk assets or a high-risk trading strategy must be escalated for appropriate review and remediation.

PERMISSIBLE: Two of the instances under which trading is permitted under the Volcker rules is a) Market Making-Related Activities and b) Risk-Mitigating Hedging Activities.

MARKET MAKING: If the banking entity is trading in a financial instrument (figure 2), and if the entity's activity is market making-related and meets the requirements regarding compensation arrangements, limits, and the types and risks of the financial instruments on the trading desk that are designed not to exceed, on an ongoing basis, the reasonably expected near term demands of a client, and the seven metrics (figure 3) are met, and there are no material conflicts of interest nor material high-risk exposures then the activity is permitted.

FIGURE 2. LIST OF FINANCIAL INSTRUMENTS

Financial Instruments

SECURITIES*

SWAPS AND SECURITY-BASED SWAPS

PHYSICAL COMMODITY FORWARDS

FOREIGN EXCHANGE SWAPS AND FOREIGN EXCHANGE FORWARDS

RETAIL FOREIGN EXCHANGE AND RETAIL COMMODITY TRANSACTIONS

AN OPTION ON ANY OF THE ABOVE

FUTURES CONTRACTS AND OPTIONS ON FUTURES CONTRACTS

Excluded from Financial Instruments

ANY LOAN, LEASE, EXTENSION OF CREDIT, OR SECURED OR UNSECURED RECEIVABLE THAT IS NOT A SECURITY OR DERIVATIVE

A COMMODITY THAT IS NOT AN EXCLUDED COMMODITY *(OTHER THAN FOREIGN EXCHANGE OR CURRENCY)*,

A DERIVATIVE, A CONTRACT OF SALE OF A COMMODITY FOR FUTURE DELIVERY,

AN OPTION ON A CONTRACT OF SALE OF A COMMODITY FOR FUTURE DELIVERY

Proprietary Trading does not Include

ANY PURCHASE OR SALE OF ONE OR MORE FINANCIAL INSTRUMENTS THAT ARISES UNDER A REPURCHASE OR REVERSE REPURCHASE AGREEMENT

ANY PURCHASE OR SALE OF ONE OR MORE FINANCIAL INSTRUMENTS THAT ARISES UNDER A TRANSACTION IN WHICH A SECURITY IS LENT OR BORROWED TEMPORARILY PURSUANT TO A SECURITIES LENDING AGREEMENT

RISK-MITIGATING HEDGING ACTIVITIES are permitted if conducted to reduce specific risks to the banking entity. The requirements in general that permit risk-mitigating hedging are as follows:

- Correlation analysis and independent testing to ensure hedging may reasonably be expected to demonstrably reduce specific, identifiable risk(s) being hedged
- Identified risks include: market risk, counterparty or other credit risk, currency or interest rate risk, commodity price risk, basis risk or similar risk of the identified underlying and hedging positions
- Does not give rise, at the inception of the hedge, to any significant new or additional risk that is not itself hedged at the same time
- Requires ongoing recalibration of the hedging activity
- Compensation is not designed to reward or incentivize prohibited proprietary trading
- With any purchase or sale, contemporaneously document:
  - specific, identifiable risk(s) of the position that is being hedged
  - specific risk-mitigating strategy that the purchase or sale is designed to fulfill
  - trading desk or business unit responsible for the hedge
  - Record to be retained 5 years.

FIGURE 3. THE SEVEN METRICS

Risk Management

RISK AND POSITION LIMITS AND USAGE

RISK FACTOR SENSITIVITIES

VALUE AT RISK (VAR) AND STRESS VALUE AT RISK (STRESS VAR)

Source of Revenue

COMPREHENSIVE PROFIT AND LOSS ATTRIBUTION

Customer Facing Activity

INVENTORY TURNOVER

INVENTORY AGING

CUSTOMER-FACING TRADE RATIO - TRADE COUNT BASED AND VALUE BASED

RISKY INVESTMENT CASE STUDIES

JP MORGAN

In 2007 and 2008 JP Morgan(7) had bought an index tied to credit default swaps. In general this would tend to protect JP Morgan if the economy worsened. In 2011, the CIO decided to counter this position. Since the unwind costs could be high, the CIO decided to put on an offsetting trade instead. However, due to a correlation mismatch, basis risk and market risk were introduced. There was a perception that the CIO engaged in proprietary trading in the hedging book. CEO Dimon "played a key role in refashioning the CIO into a unit with a heightened emphasis on making profits by taking on greater trading risk." At the heart of the matter also, was a key trader in the London office, Bruno Iskil, nicknamed the "London Whale", due to the size of his trades, who was reported to ignore cautionary concerns by New York. In any case, the strategy went wrong resulting in the unanticipated loss, amounting to over $6Bln.

GOLDMAN SACHS

A New York City jury found former Goldman Sachs trader Fabrice Tourre liable for fraud for his role in a failed mortgage deal that cost investors $1 billion. " The SEC accused Tourre, of misleading investors in a product known as Abacus 2007-AC1 by failing to disclose that hedge fund billionaire John Paulson helped choose, and intended to bet against, mortgage securities underlying the 2007 deal" according to Reuters, 2013/08/01(8).

QUANTITATIVE RISK-MANAGEMENT MEASUREMENTS: Risk and Position limits must be reported in the format used by the banking entity for risk management of each trading desk. Risk can be measured not only by VaR and Risk Factor Sensitivities (figure 4) but also as net open positions. When other criteria are used to measure risk, both the value of the risk and limits, as well as the value of the variables used to assess the limits must be reported.

FIGURE 4. RISK FACTOR SENSITIVITIES

	COMMODITY DERIVATIVES	CREDIT	CREDIT-RELATED DERIVATIVES	EQUITY	EQUITY DERIVATIVES	FOREIGN EXCHANGE DERIVATIVES	INTEREST RATE, INCLUDING DERIVATIVES
MATURITY	●	●	●		●	●	●
VOLATILITY	●		●		●	●	●
CORRELATION	●		●		●	●	●
NON-LINEARITIES	●		●		●	●	●
CREDIT SPREADS (CREDIT & MARKET SECTORS)		●	●				
INTEREST RATES (ALL RELEVANT MATURITIES)		●				●	●
CREDIT SHIFTS, PARALLEL AND NON-PARALLEL			●				
EQUITY PRICES				●			
MARKET SECTORS AND SEGMENTS				●			
MAJOR CURRENCY PAIRS						●	
INTEREST RATE SHIFTS PARALLEL AND NON PARALLEL							●

The amount of risk that a trading desk is permitted to take, plus usage must be reported using at a minimum, the "Risk Factor Sensitivities" and Value-at-Risk and Stress Value-at-Risk metrics. A banking entity must report the Risk Factor Sensitivities that are monitored and managed as part of the trading desk's overall risk management policy. Factors shared in common by multiple trading desks, such as the equity price factor, must be applied consistently across its trading desks so that the sensitivities are comparable. The Quantitative measurements are detailed in Figure 5.

FIGURE 5. MARKET MAKING RELATED QUANTITATIVE MEASUREMENTS REQUIRED

Risk Management Measurements

RISK AND POSITION LIMITS AND USAGE

RISK FACTOR SENSITIVITIES

VALUE-AT-RISK, 99% OVER 1 DAY

STRESS VALUE-AT-RISK

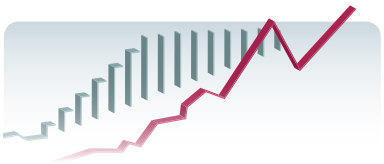
TRADING DESK'S HOLDINGS ONLY, AS WELL AS LARGER AGGREGATION OF POSITIONS

Source of Revenue Measurements

COMPREHENSIVE PROFIT AND LOSS ATTRIBUTION
- Due to existing positions
- Due to new positions

STDDEV OF P&L *(30, 60, 90 DAY LAG PERIOD)*

DUE TO CHANGES IN SPECIFIC RISK FACTORS
- Cashflows
- Cost of Carry
- Changes in reserves
- Changes due to correction, cancellation, trade exercise
- Fees, commission, other payments
- Historical comparisons



Customer Facing Activity Measurements

INVENTORY TURNOVER
- Gross notional value
- Delta adjusted notional
- PV10 for interest rate derivatives (10 year bond equivalent value)
- Calculation: 30, 60, 90 days

INVENTORY AGING
- Asset aging schedule
- Liability aging schedule

CUSTOMER-FACING TRADE RATIO
- # trades with a customer
- # trades with a non-customer
- $ value with a customer
- $ value with a non-customer

THE FOLLOWING RISK MANAGEMENT REQUIREMENTS ARE NEEDED FOR TRADING DESK, REPORTED DAILY COMPLIANCE: A banking entity must monitor for and prohibit potential or actual exposure to high-risk assets or high-risk trading strategies by each trading desk that relies on certain exceptions in order to trade. Note that there is wide room for subjectivity in the pricing models used, determination of data to use (source, coverage), and in determination of what "significant" can be. External validation is subjective. It is to be noted that the use of external rating agencies was cited as a key enabler of the financial breakdown. Enhanced compliance program to include:

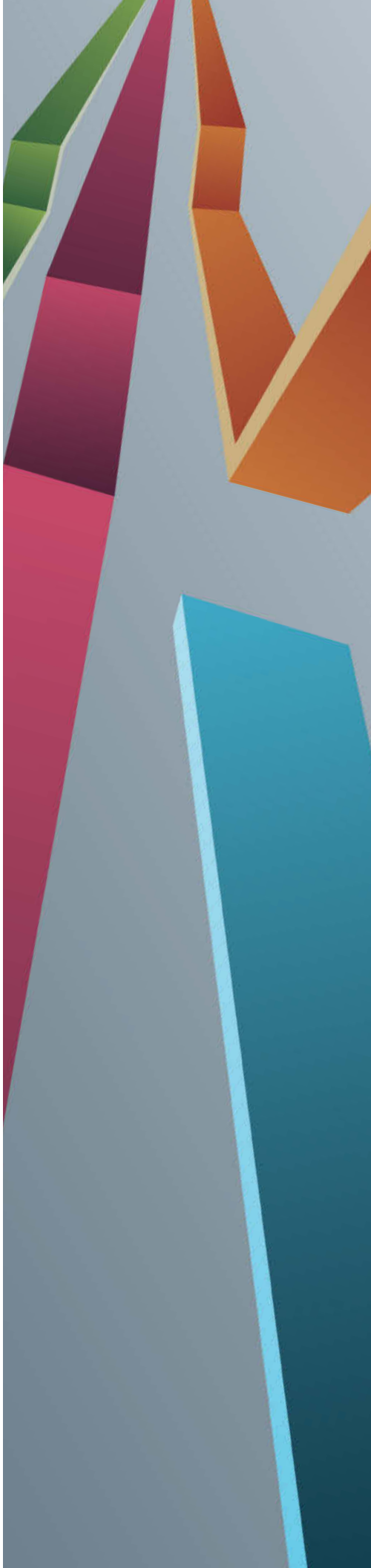
- Assets reliant on pricing models, whose model inputs cannot be externally validated
- Assets that cannot be externally priced
- Assets/Strategies with significant historical volatility
- New products with rapid growth and new history;
- Assets with significant leverage,
- Assets where capital and liquidity standards cannot account for risk;
- Significant concentration to sectors, risk factors or counterparities

RISK INFRASTRUCTURE: In order to be in compliance with the Volker Rule the institution should operate and maintain a technology framework that enables each 'banking entity' to identify, manage, monitor and report on the risks related to all 'covered trading' activities. The infrastructure should have capabilities that support the internal compliance program, including internal controls, alerts, excess management (escalation workflows and 'real-time' risk exposure calculations) which facilitate on-going review and validation of the approaches each 'banking entity' deploys. The infrastructure should provide for an independent review and reporting capability to provide C level oversight as detailed in the Rule that is not part of existing desk level or proprietary risk systems.

The system must be able at any time to prove at any time that the 'banking entity' is undertaking hedging activities that, significantly mitigate and demonstrably reduce one or more specific and identifiable risks including:

- Market risks
- Counterparty and related credit risks
- Currency or FX risks
- Interest rate risks
- Commodity price risks
- Basis risk or similar risks

And does not give rise to any significant new or additional risks.



TMX TECHNOLOGY SOLUTIONS

Razor Risk™

TMX Group's award-winning 'Razor' framework provides near real-time risk calculations and a monitoring framework that enables management to view their risk across the entire trading book. Clients use Razor's advanced analytics and scenario calculations to achieve best practice in managing risk exposures for credit, market, clearing and liquidity risk on one consolidated platform.

LIMIT AND EXCESS MANAGEMENT

The Razor Limit Management functionality provides the comprehensive limit and excess management functionality required from an Enterprise-wide limit management solution. This functionality includes:

- Broad set of limit functionality: pre-settlement limits, settlement limits, limits in reduction, multi-currency, spike limits, revolving or non-revolving limits, warning thresholds and flexible tenors.
- Diverse set of limit types: Razor enables limits and exposure to be measured at any aggregation level including Counterparty, Industry, Region, Country, Product Type, Internal business unit, etc.
- Counterparty Management: Definition and maintenance of counterparty information. Full support for flexible counterparty hierarchies and multiple parents.
- Excess Management: Comprehensive excess management functionality including real time monitoring or threshold warning breaches and actual breaches, plus reporting and integration with work flows to facilitate reviews and escalation processes/follow up activities/corrections

BACK TESTING

Razor supports back testing across all of its methodologies to provide on-going recalibration of hedging activities to ensure hedging activities satisfy the requirements at all times. This enables any internal models to be periodically reviewed and independently verified.

REFERENCE DATA

Razor supports Internal hierarchy structures (desk by desk), external hierarchies (are they associated or linked to subsidiaries and other 'covered funds', etc.), to ensure overall exposures stay within the guidelines (3% of individual capital or aggregated 3% of Tier 1 capital)

STRESS TESTING AND SCENARIO ANALYSIS

Razor supports hypothetical and actual stress testing scenarios, for both historical and Monte Carlo simulation. Stresses can be applied on market risk factors, credit factors or model parameters, and the periodicity of the runs, simply configured. What if trade, market or credit factors can be defined to determine the impact of a particular event in near real time.

AGGREGATION

Razor's portfolio aggregation capability enables users to drill down to any desired aggregation level, including currency, product type, risk type, business unit or any combination of these. Aggregation levels are user-definable, and there are no pre-conceived notions of hierarchies inherent to the data design. Razor supports full drill-down down to the transaction level to determine contribution to the overall risk results. Razor also enables VaR results at any aggregation level to be compared against a baseline set of VaR results. This simplifies significantly the validation of VaR results on a daily basis.

LEADING EDGE ANALYTICS

Razor Risk is widely known for its innovations in financial engineering and its extensive coverage of financial instruments, scenarios and advanced analytics, across both the trading and banking books. In 2004, Razor Risk was awarded risk magazine's 'technology development of the year award' for its Razor technology, and it continues to lead the industry as the methodology of choice for the development of innovative enterprise risk management solutions. The proven performance of Razor Risk's risk engine provides the basis for even the most challenging real-time risk analytics as well as end-of-day analysis.

RISK REPORTING

The Razor Risk platform's reporting capabilities facilitate independent audit capabilities and storage of all records at a flexible minimum time period, in line with internal policies and regulatory frameworks, including the ability to produce/reproduce required reports ***promptly***.

Market Risk	Credit Risk and Capital Management	Liquidity Risk
HSVAR	MTM + ADDON	MARKET LIQUIDITY RISK
MCVAR	MONTE CARLO PFE	FUNDING LIQUIDITY RISK
CREDIT VAR	EE, EPE, EEE, ENE, EEPE	CASH FLOW ANALYSIS
SPECIFIC RISK	CVA/DVA	STRESS SCENARIOS
RISK FACTOR DECOMP.	CREDIT MIGRATION AND MODELLING	BEHAVIOURAL MODELLING
MARGINAL VAR	ECONOMIC CAPITAL	DEPOSITOR RUNOFF
INCREMENTAL VAR	REGULATORY CAPITAL – STANDARDIZED AND IRB	COUNTERBALANCING CAPACITY
COMPONENT VAR	NETTING AND OFFSETTING	FIRE SALES
FLEXIBLE HOLDING PERIODS	COLLATERAL MODELLING AND OPTIMIZATION	LCR
INCREMENTAL RISK CHARGE	ACTIVE CREDIT PORTFOLIO MANAGEMENT	NSFR
STRESSED VAR		LEVERAGE RATIO

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Conclusions

The objective of ring-fencing covered funds is one aspect of the rule, with definitive requirements that can be addressed. The objective of ring-fencing "proprietary" trading is much more difficult to achieve, since it relies on a myriad of documentation, proprietary internal models, and varied selection of input to the models, self-assessment of complex derivatives in complex systems. This paper provides general guidance in this area. The regulatory framework will be implemented in unique ways within in each organisation, however with the right risk management techniques and infrastructure in place, organisations will be able to focus on running their businesses rather than be tied down with these new monitoring and reporting requirements.

ABOUT RAZOR RISK

TMX Technology Solutions recognizes that to proactively measure and manage risk, it is necessary to manage the total risk of a financial institution across all of its global activities. Razor Risk products have been created to help transform the way banks, brokers, central counterparties and stock exchanges in many countries manage and measure risk and capital.

To find out more about how Razor Risk can be an essential component of your optimal trading and risk infrastructure today and into the future, visit **tmxtechsolutions.com/razor-risk**

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