Assessing the impact of COVID-19 on global market risk management

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Introduction

The COVID-19 crisis has resulted in widespread instability across global financial markets. This global impact of the crisis is a unique event in history as there has been no prior instance of multiple countries imposing lockdowns to check the spread of a pandemic. Unlike the 2008 financial crisis, which impacted developed markets more than emerging economies, the current crisis is global in nature, more unpredictable and without precedent.

As a result of the COVID-19 crisis, financial markets have become volatile across all asset classes, both cash and derivatives – equities, rates, foreign exchange, commodities and credit. Markets have witnessed both crashes and rallies with unpredictable swings across asset prices and credit downgrades, resulting in financial instability and a liquidity crisis for many organisations. Such a scenario is likely to continue as global financial markets look to take gradual steps towards recovery. In our view, this period of turmoil in global financial markets will pose a challenge to the banking and financial services (FS) industry from a financial risk management perspective. The FS industry is expected to face challenges on multiple fronts such as capital, credit slowdown, excess liquidity, defaults, physical assets versus digitisation, and low to negative rates. In this article, we have tried to assess the financial risk impact of the crisis and more specifically, the impact on market risk management practices. We have looked at global trends and scenarios for the months of February, March and April 2020 to assess the possible market risk trends better.

This period of turmoil in global financial markets poses a challenge for the FS industry from a financial risk management perspective.

Observations across major asset classes

Asset class/ trading desk	Key trends and scenarios
Equity spot	• Extreme volatilities have been observed across equity markets during the current crisis. The S&P 500 witnessed a Level 1 market-wide circuit filter on multiple occasions in March 2020, registering a drop of more than 7% from the previous closing levels. • A unique scenario in this crisis has been the contribution of both crash and rise scenarios to profit and loss (P&L) shocks.
Chicago Board Options Exchange (CBOE) Volatility Index (VIX) (equity volatility/ volatility of volatility)	• There was a steep rise in March 2020 and an increase in volatility of the VIX. • As funding costs increase due to liquidity crunch, leveraged VIX exchange traded note (ETN) positions turn into loss-making ventures and must be unwound, leading to procyclical events. • With volatilities at peak, many institutions made gains in Vega and compensated for other losses.
Commodities – crude oil	• There was a sharp drop in crude oil prices, with West Texas Intermediate (WTI) crude oil trading in a negative zone for immediate delivery contracts as extremely weak demand overwhelmed storage capacity.
Interest rates	• Treasury yields fell between mid-February 2020 and March 2020. • Interest rates witnessed sharp volatility, with the Federal Reserve slashing Fed funds target rate by 150 bps to 0.25% at the beginning of March 2020. • There is a probability that the Fed rate will go into the negative rate territory by next year and bank portfolios which were previously not hedging USD will now need to assess impacted trades.
Equity derivatives (dividend forwards)	• Many major investment banks reported big losses due to revenue wipeouts from trading equity derivatives. • Exotic products such as dividend futures that are linked to shares and corporate payouts decreased during the crisis, leading to a negative impact in equity trading revenue.
Credit spreads	• Credit default spreads (over risk free rate [RfR]) widened for corporate bonds across ratings buckets.
Foreign exchange (FX) markets	• FX markets have witnessed unprecedented volatility due to turmoil in equity and fixed income markets. • Emerging market (EM) currencies such as INR, ZAR, MXN, BRL and TRY have witnessed large drops against the US dollar, with a market sell-off due to the COVID-19 crisis and perceived safe-haven status of the US dollar, contributing to its surge against these EM currencies.
Credit valuation adjustment (CVA) and hedging desk	• CVA desks have become more important during a credit crunch as they buy counterparty hedges for trading desks. • P&L swings for barrier products has further led to additional dynamic hedges, increasing costs of hedging. • An increased need for hedging risk has led to increased premiums, even for shorter-term maturities. • Products with cross gamma (changing delta in one asset due to change in price of another asset) have been substantially hedged/reduced to cut down losses. • Hedging costs have forced desks to resort to dynamic hedging strategies based on considerations of counterparties available for executing hedging strategies, as well as costs/premiums involved.

Impact on risk-weighted assets (RWAs) for market risk

Increased volatility and large movements in recent historical market data has led to higher risk-weighted assets (RWAs) being reported by most major banks in the end of March 2020. Market-risk RWAs are made up of four components, namely value at risk (VaR) RWA, stressed value at risk (SVaR) RWA, incremental risk charge (IRC) RWA and comprehensive risk measure (CRM) RWA. We will discuss these four components in detail.

Market risk RWA = VaR RWA + SVaR RWA + IRC RWA + CRM RWA

All components of market-risk RWAs are impacted

VaR	SVaR	IRC	CRM

a. VaR RWA

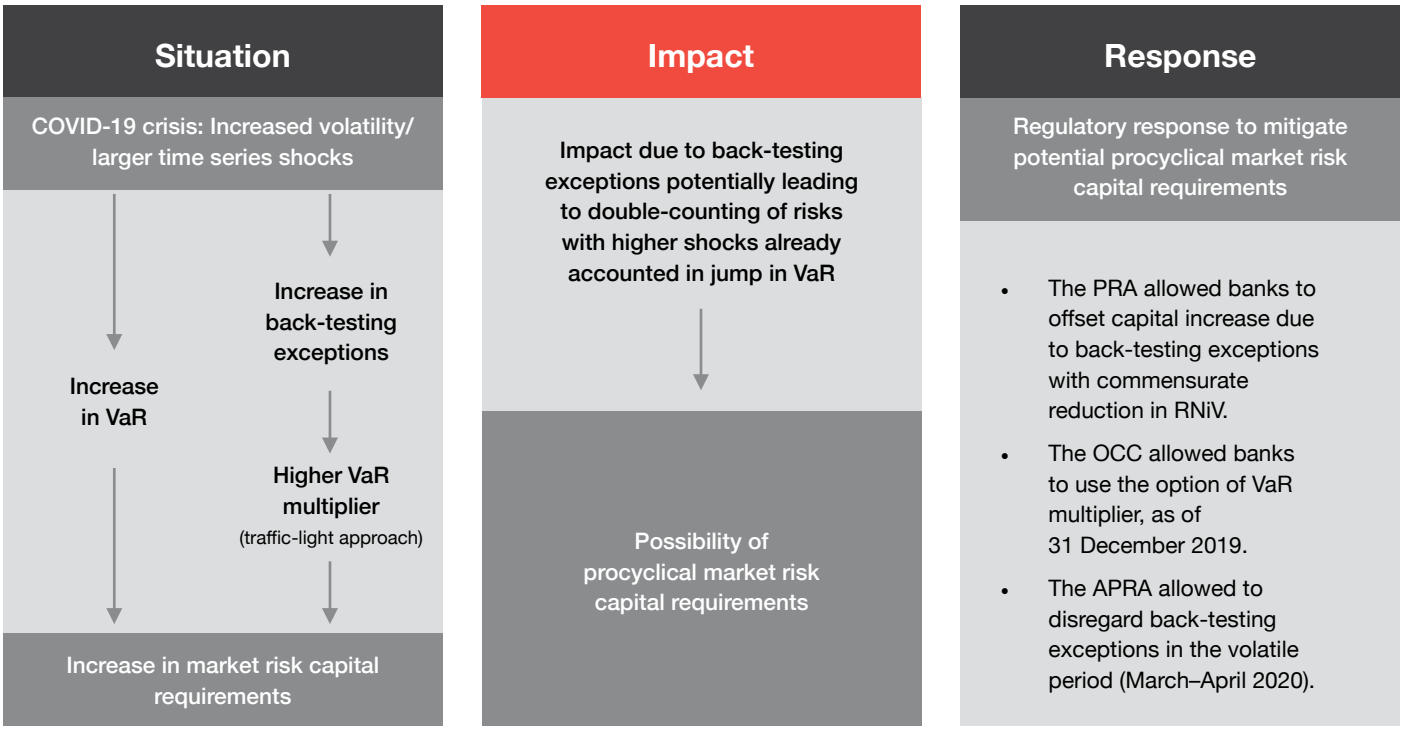
Risk management VaR is calculated at a one-day time interval, whereas regulatory capital VaR is calculated at a 10-day time interval. VaR breaches have recently witnessed time series data shocks, leading to huge increases in VaR RWA and additional VaR blow-ups for exponential weighted VaR. As detailed in section 2, products like equity derivatives, stocks, bonds and commodity futures have been affected for various asset classes and trading desks. For quite a few firms, regulatory VaR capital is already close to SVaR or more than that, particularly if the firms specialise in short exotic risks such as correlation/volatility.

VaR breaches have led to a huge increase in VaR RWAs.

On 22 April, the European Banking Authority (EBA) announced flexibility in the prudential requirements for market risks by proposing to adjust the capital impact by amending its standards on prudential valuation.[1] The EBA plans to allow application of 66% aggregation factor until 31 December 2020 for prudential reporting. It also plans to delay the reporting of standardised approach (SA) figures (as per the Fundamental Review of the Trading Book [FRTB]) to September 2021.

Case study: Back-testing exceptions and regulatory response

Figure 1.1: Possibility of procyclical market risk capital requirements due to increase in back-testing exceptions and regulatory response



Source: PwC analysis of regulatory responses to the COVID-19 crisis

1. https://eba.europa.eu/eba-provides-further-guidance-use-flexibility-relation-covid-19-and-calls-heightened-attention-risks

As explained in Figure 1.1, market volatility has led to a large number of backtesting exceptions, creating problems for banks due to higher market risk capital requirements through an automatic application of a higher VaR multiplier. Regulators have responded with measures aimed at preventing such procyclical market risk capital requirements:

- The Prudential Regulation Authority (PRA) in the UK issued a statement on VaR back testing on 30 March 2020.[2] It allowed backtesting on a temporary basis for any increment in capital requirement on account of exceptions, with a commensurate reduction in the risk not in VaR (RNiV).
- On 1 May 2020, the Office of the Comptroller of the Currency (OCC) and the Board of Governors of the Federal Reserve System in the US gave certain banks the option to use an earlier multiplication factor (dated 31 December 2019), in response to the question on market risk capital rule in the light of the COVID-19 crisis. The banks can use that instead of a higher multiplication factor on account of VaR backtesting exceptions.[3]
- On 18 May 2020, the Australian Prudential Regulation Authority (APRA) allowed modelling-authorised deposit-taking institutions (ADIs) to disregard backtesting exceptions in the highly volatile period of March and April 2020.[4]

b. SVaR RWA

Regulatory VaR capital has come close to breaching/has breached the SVaR for many banks in current volatile period. In addition, there is the challenge of incorporating the new stress period window for the purpose of calculation of the SVaR, which is currently mapped to the 2008 recessionary period for majority of banks (volatility of this window being another concern). In this regard, the PRA on 7 May 2020 clarified that it does not expect firms to update their 12-month SVaR window to the current period (post COVID-19) of financial stress.[5] We think that in the near future, banks will find it challenging to update the SVaR window period in order to accommodate the post COVID-19 volatility and also need to have adequate governance mechanisms in place for such an update.

The COVID-19 crisis poses a challenge for incorporating the new stress-period window for calculation of SVaR.

c. IRC RWA

IRC is a regulatory requirement prescribed by the Basel Committee in response to the 2008 global financial crisis. IRC augments the existing VaR and measures the impact of loss on account of default or rating migration events at a 99.9% confidence score over a one-year capital horizon period. All the debt instruments, including structured credit instruments, are included in the scope of IRC calculation.

IRC computation involves generating loss distribution scenarios as explained below:

Total loss = **default loss** + **migration loss**;

where (a) default loss = **exposure* loss given default (LGD) and (b) migration loss** = **MTM** new rating - **MTM** old rating

A typical asset X with a credit rating of AAA would be subject to rating migration threshold scenarios, as depicted below:

AA	A	BBB	BB	B	CCC
X	**X**	**X**	**X**	**X**	**X**
AAA	AAA	AAA	AAA	AAA	AAA

Source: PwC analysis of rating migration scenarios

2. https://www.bankofengland.co.uk/-/media/boe/files/prudential-regulation/publication/2020/var-back-testing-exceptions-temporary-approach.pdf?la=en&hash=2C747DA5257758AE3AF33B47DE2D29F7DBB2D86F
3. https://www.occ.treas.gov/news-issuances/bulletins/2020/bulletin-2020-47.html
4. https://www.apra.gov.au/banking-covid-19-frequently-asked-questions
5. https://www.bankofengland.co.uk/prudential-regulation/publication/2020/pra-statement-on-prioritisation-covid19

The global economy is expected to enter a period of recession and some countries will be affected more than others, depending on how they handle the COVID-19 crisis and resume economic activities post lockdown periods. As a result, there is a high possibility of a surge in defaults among the non-financial corporate borrowers as many industries are expected to find it difficult to manage their cash flows and experience stress in their working capital management.

BBB rated instruments in more vulnerable sectors such as oil and gas, leisure, hotels and airlines are likely to undergo rating deterioration. Even sovereign instruments are exposed to the risks of such ratings downgrades. For example, on 1 June 2020, a leading credit rating agency downgraded India's ratings to Baa3.[6]

> Increased instances of default and rating downgrades will cause IRC numbers to swell.

As defaults and ratings downgrades become increasingly common in the post COVID-19 world, IRC numbers for investment banks are likely to swell as credit spreads are expected to widen across sectors. The investment banking industry is likely to see a surge in the IRC capital requirement but should be wary as this can also trigger a risky asset sell-off or a general aversion to risky credit assets.

d. CRM RWA

CRM captures the capital charge for securitised products, with the aim of measuring and monitoring the risks in a bank's correlation-trading portfolio, considering credit spread, correlation, basis, recovery and default risks. RWAs for such portfolios have also increased for many banks, with such exposures contributing to a rise in market risk RWA.

6. https://www.moodys.com/research/Moodys-downgrades-Indias-ratings-to-Baa3-maintains-negative-outlook--PR_424605

How should banks adapt?

Some of the major focus areas in the current crisis are outlined below:

Pricing and risk models/systems

- FIs have seen traders and risk managers looking to recalibrate their trading models to incorporate new scenarios such as negative crude oil prices and enable them to capture pricing and market risks accurately.
- Such unique scenarios observed during this crisis will require trading and risk management desks to address the challenges of measuring and managing risks, and call for recalibrating/revalidating the existing models/risk systems for such scenarios, including negative crude prices, negative Fed rates, as well as regulatory guidance in the wake of COVID-19.

Market risk limits

- Market risk limits have been pressured and limits had to be revised upwards by most banks as higher volatility led to an unprecedented rise in reported RWA capital and limit breaches.
- Given the risk appetite, some of these temporary limit increases will be revised downwards as fewer volatile periods will be factored into VaR computations, along with sell-offs by desks to reduce risks.

VaR window update and historical market data

- In order to reduce back-testing exceptions and incorporate recent volatile shocks in time series data, the frequency of VaR window update needs to be improved and the VaR window lag needs to be reduced.
- The VaR window update process requires several data quality checks + other processes/reporting. It is operationally intensive for banks to roll the VaR window with an overhead of maintaining data quality of large sets of time series used in market risk calculations.
- Firms need to ensure that their historical market data teams become operationally efficient and focus on using smarter data quality checks and effective market data sourcing strategy to enable them to reduce the VaR window lag.

Market risk scenarios

- Market risk scenarios are being specifically built and crash + rally scenarios are being observed in this crisis, unlike market risk scenarios that usually incorporate crash simulations.
- As market risk metrics are lagging indicators, market risk scenarios are important to help trading desks manage risks better. Complex risk scenarios are also being built by banks for cross-asset class, cross-portfolio and crash + rally simulations as markets are seeing swings and P&L impact due to movement on both sides.

Market risk + credit risk team up

- Wild P&L swings have brought focus on monetising the portfolios for trading desks to manage market risks. This showcases the ability of counterparties to fulfill their payment obligations.
- Coordinated risk management efforts, especially for CVA/DVA risks, can help trading/hedging desks manage risks better.

Upcoming reforms: FRTB and LIBOR transition

- Upcoming reforms will require operational, technological and capacity ramp up for market risk management teams.
- The London Inter-bank Offered Rate (LIBOR) reform would require any LIBOR-linked model remediation/recalibration and documentation changes to be prioritised from a market risk models perspective, keeping in mind the same timelines for LIBOR cessation.
- FRTB implementation is a big challenge. A delayed timeline gives a realistic opportunity for firms to implement, test and address challenges as well as have adequate time for a parallel run before the system goes live on January 2023.[7]

Source: PwC understanding of how banks should adapt to new crisis scenarios

Conclusion

Given the challenges discussed and impact on how risks are being managed, the operating models of banks need to evolve to manage pressures on market risk management operations and adapt to their market risk capital models with appropriate governance in future.

The operating models of banks need to evolve to manage pressures on market risk operations and their governance structures must adapt to market risk models.

7. https://www.bis.org/press/p200327.htm

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