



WHITE PAPER

RISK MANAGEMENT

RISK IN THE FRONT OFFICE?

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Impacts from the crisis

Background

The crisis has since 2008 unleashed a series of tremors still reverberating through the sector. With this there have been countless changes in capital markets. We have probably felt most of the direct impact of these tremors but the indirect impacts and changes are likely to continue for many years to come. New regulations will not be fully in force for a number of years and banks and financial institutions are grappling and assessing all the time with how to manage their businesses in response to this new world.

Impacts

I will note here just a few of the changes pertinent to this discussion:

- Increase in regulatory costs of doing business. A strong trend of regulation post-crisis has been to increase the capital requirements around doing business in capital markets. Basel 2.5 and 3 both significantly increased the capital requirements around market risk, counterparty risk and introduced a new Credit Value Adjustment (CVA) capital charge. Additionally these regulations allow only higher quality assets to qualify as eligible capital, at a time where such assets are becoming increasingly sought after and costly to hold. Mandated central clearing has increased the initial margin requirements, and mandated non-centrally cleared Initial Margin is appearing on the horizon soon. CVA is also gaining increased prominence post-crisis as an accounting P&L adjustment, with the spotlight of a general widening and increased volatility of credit spreads. Lastly regulatory liquidity requirements have increased, requiring more liquid assets to be available for future adverse market conditions.

- Margins reducing. Reduced margins are already low due to the current low interest rate environment and exacerbated due to the increase in regulatory costs. These headwinds are set against a background of increased funding costs (which has driven increased focus on funding costs, or Funding Value Adjustment (FVA)), reduced volumes – particularly in the more complex product areas – and the mandated movement of some profitable businesses onto exchanges. All of these factors have increased downward pressure on margins.

- Awareness that the risks are real. Where institutions may have underestimated risks pre-crisis in some areas, there is a much deeper acknowledgement now that devastating losses can occur and that risk management has a vital role to play in ensuring these do not happen in the future.

As a result of these changes some business lines in the capital markets space are becoming less profitable to the point of not returning cost of equity. Risk management has taken a much more prominent role in the mind of decision makers. While banks are re-assessing their business models in this new era, decisions have to be made on which business lines and even trades are profitable against a risk adjusted return. In a paper by McKinsey¹, a number of mitigation strategies are proposed for how banks may optimize business lines to achieve a return on equity above desired hurdle rates. Key in these strategies is bringing Risk closer to the Front Office decision making process in terms of minimizing capital requirements and optimizing portfolios.

¹SOURCE: "DAY OF RECKONING? NEW REGULATION AND ITS IMPACT ON CAPITAL-MARKETS BUSINESSES", MCKINSEY & COMPANY, 2011.

Consequences for risk management

So if Risk is to come closer to the Front Office, what are consequent changes to risk management as it has been?

Increase in use of advanced risk measures

New regulations have attempted to move banks increasingly towards using more advanced capital measures as a way of reducing their overall capital consumption². Using advanced (usually simulation-based) measures for market risk, counterparty and CVA capital means not only are the capital charges usually lower, but they are also more risk sensitive. The aim of advanced approaches is to reward portfolios with genuinely lower risk profiles with lower capital charges. Moving towards advanced approaches means actions taken to reduce the bank's risk exposure are more directly observable in their effect on lowering the resultant capital charge. By successfully gaining a waiver to calculate capital under advanced methodologies, a bank may more credibly create a dialogue between Front Office, Risk Management and decision makers to optimize the portfolio and reduce the capital charges.

Consistency, completeness and appropriate accuracy

Accuracy of risk management is always a sensitive topic and has often been the objection of the Front Office to utilizing riskbased numbers. I assert that what Risk calculations should aim for is not perfect accuracy, which is almost always an illusion, but appropriate accuracy. Take the case most frequently raised: pricing model accuracy. Pricing models used for P&L in the Front Office are by definition as accurate as can be achieved. Pricing models used in risk would ideally be the same as the models used in the Front Office. In market risk where hundreds or possibly even thousands of simulations are required to produce the risk and capital numbers using the Front Office model – although it may not be tuned for performance – is probably an achievable goal. In counterparty credit and CVA simulations, where hundreds of thousands of deal valuations are required it isn't something I have seen achieved without utilizing alternate approximations, such as Longstaff-Schwarz. These approximations bring with them their own inaccuracies, and so in reality the challenge of imperfect accuracy is simply pushed to a different part of the calculation.

What I would argue should be targeted is appropriate accuracy – using Front Office pricing models where performance and operational considerations allow it while ensuring where risk calculations use different models they are validated under the scenarios against the backdrop of the overall calculations. For example basis-point accuracy in deal pricing will quickly become swamped in the uncertainty inherent in calibrating a multi-asset class credit simulation out to thirty years. A dogmatic approach to any one approach is not helpful to practical progress.

Consistency should be mentioned in the same breath as accuracy as the two are intricately entwined. Clearly a consistent view is a prerequisite to accuracy in valuations, but secondly consistency between front and different middle offices is important when interpreting how market moves impact the P&L, liquidity requirements and capital. Consistency also pertains to the results delivered from risk calculations – the numbers produced back to decision makers must be in a language they understand across all risk types. For instance, giving the initial margin (IM) requirement may not mean much, but translating that into an IM funding cost and hence spread is something a dealer can understand and include in deal pricing. Consistency is about ensuring the same language is spoken when comparing market data, risk factors, metrics, etc. – without which constructive dialogue will be held back.

Completeness is important as the metrics measures need to encompass all types of risk or cost affecting the institution. This means rather than the Market Risk stopping at calculating the VaR and the Credit Risk at calculating Exposure at Default, Risk needs to calculate the capital impact. All regulations need to be considered and the capital management function must be in dialogue with risk to a greater degree than before. This ties back to consistency also, which needs to be across the Front Office and all the groups contributing to the overall cost equation – Market Risk, Credit Risk, Liquidity management, collateral and margin funding.

Pre-deal

The most obvious way capital or costs can be minimized is clearly at the point they are created – at deal inception. If traders and sales people are presented with information on the effect of a deal on the bank's overall costs including CVA, FVA, initial margin requirements and capital at the point of deal inception a decision can be made as to whether the deal is profitable or what charge should be passed onto the client in order to lock in margin. Further, this information could be used to actively structure the deal, choose the trading counterparty or clearing venue to reduce the costs incurred. Providing pre-trade information is however relatively new territory for the traditional risk management function – most risk management is performed end-of-day, and it is a minority of institutions who have instituted anything but the simplest real-time risk measures.

The real-live example where we have seen the most uptake of this new way of operating in recent years is in CVA. Many banks have in the last five to ten years instituted pre-deal CVA measurement for at least the "tall tree" trades and some for all trades. This charge is often determined by and internally transferred to a separate group from the trading desk – the CVA Desk. Sometimes this is a completely automated realtime process, and sometimes it is a manual process between dealer and the CVA desk working together on crafting a deal structure and CVA price acceptable to both. Interestingly this CVA desk may have something in common with credit risk, but usually sits close to the Front Office in organizational terms. Going beyond CVA, banks want to be measuring FVA, margin requirements, market and counterparty risk capital all in a pre-deal timeframe. This requires significant changes to how risk management operates, putting risk measures in a Front Office workflows and enabling trades to trigger very fast response time risk calculations.

Portfolio optimization and analysis

Taking a philosophical perspective, risk management can be considered as an exercise in performing what-if analyses and exercising control on the bank's positions. Simulation VaR, PFE and stress testing are what-if scenarios on market rates with statistical analysis metrics of the results. The other dimension is adding or removing hypothetical positions to track the effect on portfolio risk metrics. In this new world of increased trading costs, the latter facet is being used much more actively by the Front Office when making trading decisions. Richly functioned and flexible what-if tools allow decision makers to see the effect of new business lines, strategies, hedging and portfolio optimization activities on the portfolio capital and costs.

What is fundamentally different here from the real-time requirement above is that the user needs to be able to try scenarios against a fixed starting point with full repeatability. Repeatability is crucial as it allows a hypothetical scenario to be run, analysed, questioned, modified and run again, knowing that the basis for comparison between scenarios is fixed. Further, it may be that historical analyses run weeks or months ago are brought into question and re-validation or more analysis requested. Here what is required is not a real-time environment but quite the opposite; a separate "sand-box" environment insulated from day to day changes. This type of environment is traditionally what risk departments are used to managing and has always been part of successful risk management.

Such an environment may be separate from the Front Office, but it should still have consistency with the Front Office where possible, and specifically deal-entry which is integrated with the Front Office will make a much stronger proposition when constructing position scenarios to get buy-in from the Front Office user base.

Independence and control

While Risk Management is moving closer to the Front Office in many ways, it should not be forgotten that the Risk Management function must maintain a level of independence from the Front Office if it is to operate as an effective control function. This means for example that there will be times where Risk needs to use different models or configurations from the Front Office for specific modelling requirements. This may be necessary to improve performance, or for example to model the universe of spreads capturing common risk drivers not used by Front Office pricing.

Importantly, Risk needs the independence to be able to change the modelling assumptions without being bound by the Front Office timelines or requirements – this could mean Without this independence, Risk is not able to respond to new risk regulations and requirements or to independently validate Front Office modelling approaches. This requires a system which may share modelling with the Front Office, but can still easily run calculations with a different "context" or configuration set. This is not always straight forwards for a system to achieve.

²SOURCE: NOTE THAT ALTHOUGH IN "BASEL 4" REGULATIONS THERE IS MENTION OF CAPPING THE BENEFIT THAT A BANK WOULD RECEIVE THROUGH USING ADVANCED METHODS AS A MULTIPLIER OF THE "BASIC" MEASURES, WE EXPECT A BENEFIT WILL REMAIN FOR UTILIZING ADVANCED CAPITAL METHODOLOGIES.

How we get there

To achieve all these goals requires work in different areas. The first point on use of advanced measures is an extension of the normal business of Risk Management and can be addressed by risk mostly in isolation. It will require significant additional investment – in processes to support the advanced method, the application to the regulator and usually also in systems.

The second point on consistency can be achieved through improving the risk management models where appropriate which will require engagement from the Front Office to allow this to progress quickly and effectively. Alternatively if a system architecture choice like sharing models between Front Office pricing and Market Risk is made, this goal is achieved almost immediately. However beware that where a Front Office model is used for risk with a different pricing configuration or is even re-implemented, the model needs to be revalidated.

The fourth point on portfolio analysis is usually very familiar to risk management, and to varying degrees will be practiced with the Front Office already – in market risk this is not uncommon. The challenge is to extend this practice to all types of risk, consistently through one interface. It should be intuitive for a Front Office user to enter what-if strategies and see the impact on all areas of cost and capital at the same time – from counterparty risk to VaR to liquidity. So while Risk Management may possess some of the framework to accomplish this such as having static portfolios available for analysis, having the ability to apply what-if's to the portfolio across all risk types is likely to require significant integration effort to harmonize all risk measures.

The last point on independence and control requires a system which can be configured independently from Front Office configurations. For a standalone risk system, this is of course simple. When re-using the Front Office environment, the user must have confidence that the system is flexible enough to have two parallel pricing and risk configurations.

I have left point three on real-time to the end as this is likely to be where Risk Management and the Front Office need to work closely together and make the biggest changes. The infrastructure to provide real-time risk metrics is only broadly implemented across the industry for credit limit checking. To achieve real-time cost measurement across all risk types will often require major re-thinking of a bank's infrastructure and much closer links between the Front Office systems and risk systems. Doing the calculations purely in the Front Office system may provide a solution. However this will not be a solution in every system architecture, as one still requires the fixed starting point analysis capabilities which are not usually supported by Front Office systems. An architecture to support both must be established. Secondly, risk analyses are portfolio-wide in nature so need to consolidate information from all Front Office booking systems. A system with only part of the book will not give a full picture for enterprise risk metrics. Establishing real-time or near-time interfaces between multiple Front Office systems or between Front Office systems and a risk system is difficult, and this remains one of the key challenges.

Conclusions

I have outlined above the requirements and challenges for an architecture required to provide independent and actionable risk metrics to decision makers to improve the bank's profitability. This is achievable via different approaches and architectures, and the best architecture will depend on the bank's individual circumstances and requirements. I will not attempt to draw overarching conclusions for all situations, but rather refer the reader to consider if their system is allowing them to be successful against all the criteria mentioned above. All of this is unfolding before a backdrop of pressures to reduce cost and often headcount. Implementing such changes will require significant investment, but I would argue that without this investment, a bank will struggle to remain competitive in an environment where regulations are only increasing and other institutions are adapting to the changing environment.

About FIS' solutions for risk management

FIS' solutions for risk management cover pre- and posttrade risk management; integrated, enterprise-wide market, liquidity, credit and operational risk management; asset liability management; and trade surveillance. These solutions can be used across trading and clearing platforms and around multiple asset classes to help organizations better understand their exposure, improve the visibility and understanding of risk across the enterprise, and comply with regulations globally. FIS' customers include banks, broker-dealers, securities firms, clearinghouses, hedge funds, pension funds, asset managers, insurance companies, corporations and government entities of varying sizes, geographical locations and organizational complexities.

About FIS

FIS is a global leader in financial services technology, with a focus on retail and institutional banking, payments, asset and wealth management, risk and compliance, consulting and outsourcing solutions. Through the depth and breadth of our solutions portfolio, global capabilities and domain expertise, FIS serves more than 20,000 clients in over 130 countries. Headquartered in Jacksonville, Florida, FIS employs more than 55,000 people worldwide and holds leadership positions in payment processing, financial software and banking solutions. Providing software, services and outsourcing of the technology that empowers the financial world, FIS is a Fortune 500 company and is a member of Standard & Poor's 500® Index. For more information about FIS, visit www.fisglobal.com



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