

Product Control White Paper

Benchmark of Product Control Frameworks

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Author

Frederic Juillot
Investance – Head of Finance Control and Compliance

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1. Executive summary

The measurement of performance of the activity of financial institutions is scrutinized by many actors with regard to growth perspectives, risk profile, as well as ongoing assessment of strategy.

Considering how they are organized, Product Control functions are more or less efficient in their capacity to adequately measure the performance of the activity and raise alerts. In the light of the 2008 financial crisis, regulators are prompting them to reassess their Product Control framework.

The unified model of Product Control is currently gaining momentum, bringing a holistic perspective on the understanding of activities. Seamless ownership of P/L data capture, processing and analysis is deemed providing good control over operational risk, as well as accuracy and timeliness of reporting.

The fragmented / de-coupled model of Product Control delegates responsibility of P/L control to specialized and independent units, giving emphasis to expertise and segregation of duties.

Those two models raise the question of the scope of Product Control. For the sake of controls oversight and comprehensiveness, unified models tend to encompass responsibilities at the borderline of Risk Management, Operational support and Financial reporting. De-coupled models tend to limit the scope of Product Control to P/L production and P/L explain.

Whatever the extent of responsibilities under their scope, Product Control functions almost exclusively handle cross-functional / transversal processes. Financial institutions can therefore consider efficient to place most of their cross-functional / transversal processes under the umbrella of Product Control, provided segregation of duties is still enforced.

At this juncture, Product Control functions will assume an even more pivotal role in most financial institutions. Emerging trends reflect growing importance in Product Control's valuation function. As a result of FAS 157 the governance, escalation and resolution over level 3 assets is taking an important priority.

In the United States, the IFRS and Basel II regulations will require strong commitment from Product Control for successful implementation. The transition to IFRS will have Product Control very involved in the assessment of P/L impacts, especially for the first time application.

Regarding Basel II, Product Control will be challenged on pillars II and III to facilitate the supervisory review process and the preparation of Basel II disclosures.

Preserving data integrity continues to be the cornerstone of Product Control's responsibilities. Indeed, Product Control functions can be heavily dependent on spreadsheet calculations, affecting timeliness and reliability of reporting. Automation remains critical to reporting processes with focus on reconciliations and minimizing manual adjustments.

The leading edge drivers of Product Control in the coming years are in the areas of off-shoring and valuation governance. Financial Institutions with more developed Product Control functions have started to deploy (both domestically and internationally) their more commoditized processes in the last three years. Tasks deployed range from the most simple such as reconciliations to the most complex such as valuation. Illiquidity for many assets will require a more rigorous governance for the valuation process, that provides clear accountability within management's chain of command.

There is no one best model Product Control model that fits all. Although growing in popularity, the unified model can be difficult to implement. The considerable cost of building a wide ranging staff can also be challenging in smaller financial institutions. The unified model might be more accessible if limited to the core functionalities of Product Control, those bringing most of the expected synergies.

2. Introduction

2.1. Times of crisis

How can we restore confidence in the financial system?

The 2008 financial crisis revealed that financial institutions were unable to assess and manage the risks of complex financial products and provide fair and transparent information to the market on their positions and valuations. The subprime mortgage implosion triggered off a credit crisis with far-reaching impacts in the global markets:

- Large banks went bankrupt (Bear Stearns, Lehman Brothers, Washington Mutual, Wachovia),
- Effects of the crisis extended to a worldwide scale. Countries bankruptcies had to be countered by loans of the International Monetary Fund (Iceland, Ukraine, Hungary).

The regulatory framework was inefficient to ensure the stability of the financial system:

- The flexibility of OTC markets gave way to financial creativity and sales reactivity. Excessive leverage allowed exponential growth of volumes while processing was not secured and still very manual.
- Audits from supervision authorities were not able to discover large scale frauds (Madoff's ponzi scheme raised USD 50 billion over decades).

Collapse was avoided through massive intervention of states and central banks to nationalize failing banks and restore liquidity.

2.2. Needs of reform

Communication, transparency of information is essential to maintain trust and prevent financial institutions from becoming isolated and unwillingly forced to sell assets, which can ultimately lead to their demise.

Banks, asset managers, broker-dealers are undertaking significant business re-alignment and internal re-organization to reassure clients, counterparties and shareholders on their short term and long term stability and reliability.

Exotic activities are being reconsidered. Internal controls are being strengthened through reorganizations and revised process and procedures.

Efficiency of the Risk, Middle Office and Finance functions are being assessed individually and collectively with regard to their capacity to identify, evaluate, report and steer financial and operational risks.

The frontier between those different functions is constantly being questioned with regards to constraints of independence, size and skills as well as to objectives of cross-functional / transversal and in-depth understanding of activities and associated risks.

2.3. Product control revisited

The Product Control function stands at a new frontier and plays a key role in the ability of banks to assess their positions, their results and their risks:

- Performance is scrutinized with reference to cost in capital allocation
- Activities are valued with independent pricing
- Positions are thoroughly reconciled and audit trail is ascertained

Financial institutions are now questioning the positioning of the Product Control function in their organization to ensure maximum efficiency and ability to serve business sustainability and market confidence.

The reference model of Product Control functions is the US model: several control functions are placed under a unique authority referred to as Product Control and therefore made very visible. In this model, the Product Control function is reporting to the Finance department to ensure independence versus the business.

European models have parted their control functions and placed them under several authorities, making them less centralized and visible. Some controls are performed by the Risk function, the Middle Office, Back Office and Finance.

Financial institutions are taking the opportunity of the financial crisis and consequent business re-focusing to reassess their Product Control model.

Depending on their size, diversification of activities, processes and procedures, they will opt for the organization and process that is most secure and business challenging.

3. Scope and objectives

3.1. Objectives of the white paper

This white paper provides an analysis of the different models of Product Control functions in both domestic and international corporate and investment banks.

The analysis covers:

- The scope and objectives of product control
- The philosophy of each product control model
- The ease / difficulty of implementation
- The efficiency / side effects on an ongoing basis
- The product control key performance indicators (KPIs)

3.2. Activities of participants

The financial institutions participating to the white paper cover a wide range of sizes based on market capitalization as of January 2009, with the highest at USD 110 billion and the smallest at USD 4 billion. Regardless of market capitalization size, survey results reflect participants being both globally and locally organized.

Regions	Number of institutions	Market capitalization in billion USD
Global	2	20 ↔ 110
Mainly American	1	65 ↔ 90
Mainly European	5	4 ↔ 45
Mainly Asian	1	65 ↔ 90
Total	9	4 ↔ 110

Although most of the participants have significant retail activities, the product control functions identified were only covering corporate and investment banking activities.

Some of the participants were in the process of merging with significant financial institutions during the study. Those have only been counted as one participant to this white paper.

3.3. Disclaimer

The purpose of this white paper is to provide trends and analysis on the organization of financial institutions as a basis of reflection. Those trends and analysis cannot be considered as recommendations. Further comparison and use in the context of any financial institution must be put in perspective with the background and characteristics of this financial institution.

For confidentiality purposes the findings of this white paper are presented as trends. Specificities of the organization of each participant are not identifiable on purpose.

4. Approach and methodology

The analysis of the product control model was done through the assessment of the organization, process, tools, IT architecture, achievements and KPIs of each participant.

The criteria of analysis were the followings:

- Controls enforcement and business efficiency
- Data quality and valuation capability
- Process automation and tracking
- Reporting adequacy and timeliness

The collect of information was performed through the interview of key participants in the product control process, using common questionnaires for all participants (one to several persons interviewed per financial institution).

Interviews	Risk function	Operations function	Finance function	Total
Global			4	4
Mainly American		1		1
Mainly European	2	1	5	8
Mainly Asian		1		1
Total	2	3	9	14

Considering the interest of several other financial institutions to participate to the benchmark, a second release will be issued in the second semester of 2009.

This second release will investigate further additional points of interest raised by the participants.

5. Benchmark of Product Control frameworks

The benchmark is presenting first the characteristics of Product Control frameworks as implemented in the financial institutions participating to the benchmark. Each model is then analyzed with regard to its foundations and efficiency, helping understand how Product Control functions can stand on the leading edge to face their new challenges.

5.1. Characteristics of Product Control frameworks

The characteristics of Product Control frameworks have been analyzed on four themes:

- Organization of the Product Control function
- Efficiency of the Product Control processes
- Tools and applications used by the Product Control function
- Key performance indicators

5.1.1. Organization of the Product Control function

5.1.1.1. Organization models

Over the past decade, financial institutions have been experiencing several models to position the Product Control function in their organization charts.

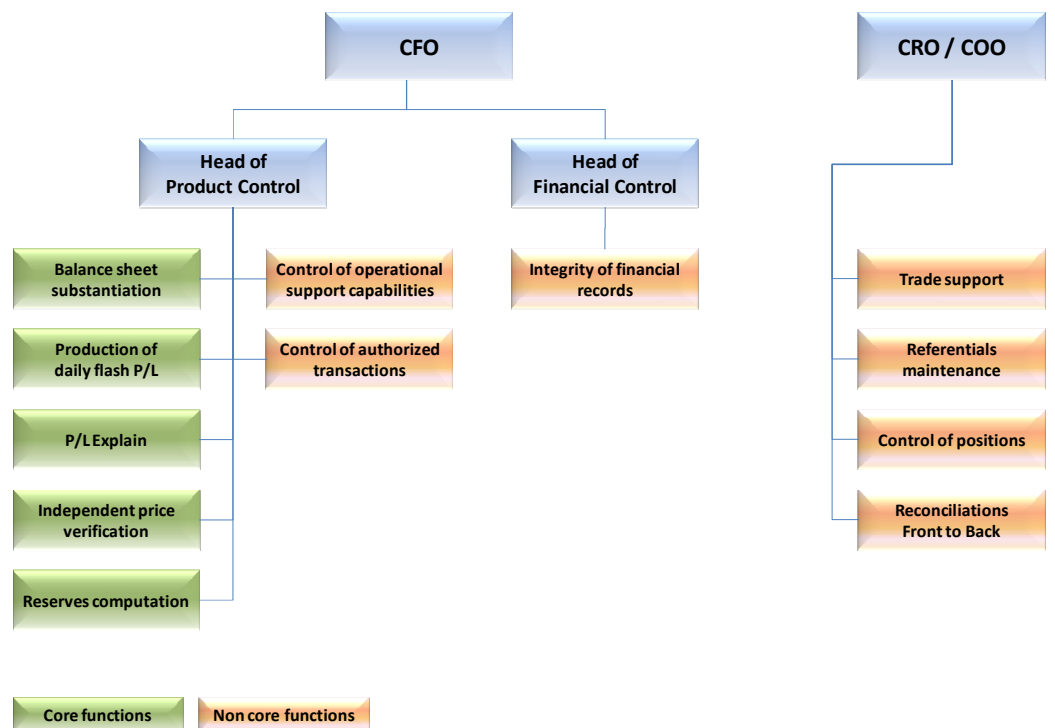
Finding the right model that balances independence, expertise, and efficiency has proven difficult for many organizations.

Some financial institutions have progressively adapted their historical framework, while others have moved back and forth between each model.

5.1.1.1.1. The unified model vs. de-coupled model

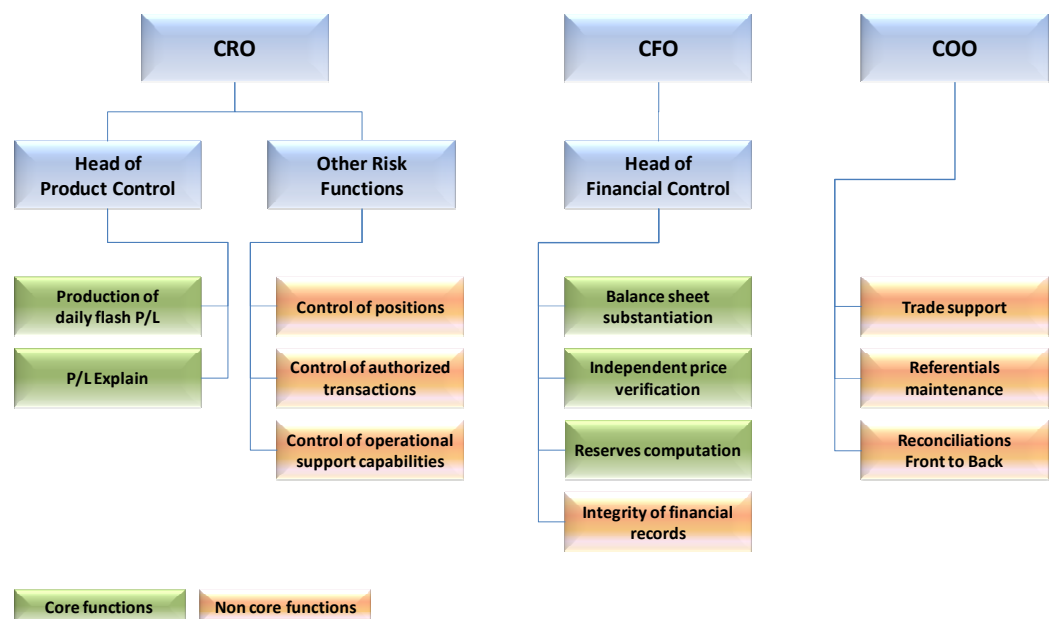
The unified model is placing all the core roles and responsibilities of the Product Control function under a single authority. Depending on the financial institutions, this authority can be the Chief Financial Officer (CFO), Chief Operating Officer (COO) or the Chief Risk Officer (CRO).

Example of unified organization model



The de-coupled model is splitting the core roles and responsibilities of the Product Control function under several authorities.

- The de-coupling can be due to the will to promote synergies with functions other than Product Control.
For example, P/L explain can be under the authority of the CRO due to synergies with the monitoring of market risk, while the other core roles and responsibilities of Product Control are under the authority of the CFO.
- The de-coupling can also be due to the will to promote efficiency considering the existence of several control models or information systems specificities.
For example, Product Control can be under the authority of the COO for the equity business line and the CFO for the fixed income business line.
- Another reason for de-coupling can be the will to strongly ensure independence and segregation of duties, especially considering key functions.
For example, pricing of assets can be under the authority of the CFO, while the other core roles and responsibilities of Product Control are under the authority of the COO.



Interviews	Unified model		De-coupled model		Total
	CFO	CRO	CFO + COO	CFO + CRO	
Global	2				2
Mainly American			1		1
Mainly European	2		1	2	5
Mainly Asian		1			1
Total	4	1	2	2	9

5.1.1.1.2. The global model vs. multi-local model

Considering their size, business organization and level of integration of their processes and systems, financial institutions can favor a global model or a multi-local model for their Product Control function.

The global model is characterized by three integration elements:

- The Product Control function is identified up to the group level in the organization chart,
- Local Product Control functions are under the authority of the group Product Control function. This can also be combined with matrix reporting to a local Head (such as the CFO for example),
- The group designs a Product Control framework based on a methodology and processes that have to be used in all branches of the group.

The multi-local model is more open and gives extensive autonomy to local Product Control functions:

- The Product Control function is not systematically identified at group level,
- Local Product Control functions are under the authority of a local Head only (the CRO for example),
- The Product Control framework is based on methodologies and processes that can be specific to each branch of the group.

Although some models are mainly multi-local, harmonization can be observed in some financial institutions for consolidation purposes. Local referentials are mapped to the group's and aggregated results are reconciled to the group's financial reporting.

When combined to a de-coupled model, some financial institutions can mix the global and multi-local models. For example, independent price verification can be under the authority of the CRO and be global, while control of hedge effectiveness can be under the authority of the CFO and be multi-local.

Interviews	Global model	Multi-local model	Mixed model	Total
Global	2			2
Mainly American	1			1
Mainly European	3	1	1	5
Mainly Asian		1		1
Total	6	2	1	9

5.1.1.1.3. Specialization of teams

Depending on the volumes and deals complexity, the product control teams tend to be more or less specialized. When specialization occurs, it is mainly done by product.

5.1.1.2. Roles and responsibilities

What should be the scope of the Product Control function? Should it be limited to the production and analysis of the daily P/L or does it bring more value extending the reach to borderline functions?

The rationale involves finding the balance between understanding the business, strengthening the controls and providing timely reporting.

Front & Middle Office	Risk Management	Product Control	Back Office	Financial Reporting			
		Balance sheet substantiation					
		Production of daily flash P/L					
	Control of operational support capabilities	P/L explain					
Trade support	Control of authorized transactions	Independent price verification					
Referentials maintenance	Control of positions	Reserves computation	Reconciliations Front to Back	Integrity of financial records			
<table border="1"> <tr> <td>Core functions</td> </tr> <tr> <td>Mostly shared function</td> </tr> <tr> <td>Function rarely in scope</td> </tr> </table>					Core functions	Mostly shared function	Function rarely in scope
Core functions							
Mostly shared function							
Function rarely in scope							

5.1.1.2.1. Core roles and responsibilities

There is clear consensus on the core roles and responsibilities of Product Control:

- Balance sheet substantiation
- Production of daily P/L (Profit and Loss)
- P/L explain
- Independent price verification
- Reserves computation

Roles and responsibilities	Model	Product Control	Other	Unknown	Total
Balance sheet substantiation	Unified	4	1		5
	De-coupled	3	1		4
	Total	7	2		9
P/L production	Unified	5			5
	De-coupled	4			4
	Total	9			9
P/L explain	Unified	5			5
	De-coupled	4			4
	Total	9			9
Price verification	Unified	4	1		5
	De-coupled	3	1		4
	Total	7	2		9
Reserves computation	Unified	5			5
	De-coupled	3		1	4
	Total	8		1	9

An accurate assessment and presentation of the P/L requires a sharp understanding of the outcomes for all those processes. Synergies seem to happen best when those processes are placed under the common authority of the Product Control function:

- Explanations for P/L movements are best performed by staff closely involved in the detailed calculations. Significant P/L swings and trends are more easily identified,
- Correlations between P/L and market movements as it relates to impact on inventory valuation can be more readily validated,
- Link between economic P/L and accounting P/L is easier to maintain while set up on a daily basis.

Balance sheet substantiation is the fundamental basis for confidence in financial reporting. All accounting balances are assigned to controllers who ensure that the account balance fairly depicts the activity. The account balances are therefore checked versus positions (contracts / inventories) and thoroughly reconciled with confirmations from counterparts, correspondent banks and custodians.

Production / reporting of the daily P/L is done through the review of positions (cf. balance sheet substantiation), price, market values. Errors in data are adjusted. Post adjustments, revenues are then reported in two main categories of P/L:

- The clean P/L, reflecting revenues resulting from intraday market moves on opening positions (sum of market movements plus daily interest),
- The dirty P/L, reflecting revenues resulting from changes in the positions (intraday sales) and provisions.

P/L explain provides the summary and commentaries to daily, monthly and year to date revenue movements based on P/L calculations. Revenue gains and losses are explained relative to trade, market related events, or accounting adjustments. While P/L reporting details the actual calculations, P/L explain reflects the qualitative components of revenue reporting

Independent price verification is very sensitive and ensures prices used for P/L valuation are presenting a fair value of the positions.

Price testing was traditionally performed monthly by most financial institutions, but considering the high level of volatility of current markets and the liquidity crisis, the trend is for more frequent price testing. A reconciled inventory file with position, price, and market value information is reviewed against several approaches:

- Third party sources: bonds and loans which are liquid are validated against third party sources (IDSI, Markit Partners). Derivatives are price tested using available third party curves (Totem, Reuters) which are in turn used in in-house or vendor models as inputs.
- Recent trades: actual transactions (greater than USD 1 million, not odd lots) within the given month are reasonable indicators of market sentiments.
- Indirect Pricing: assets which are illiquid or with no recent market observable data are price tested using the following approaches:
 - Benchmarking of comparable assets
 - Enterprise valuation (ex: based on EBITDA)
 - Discounted cash flows
 - Liquidation scenario

Reserves computation requires good understanding of the portfolio strategies and of the hypothesis used for valuations. Thorough testing has to be performed to ensure the right level of reserves, such as prospective testing, retrospective testing and control of hedge effectiveness.

Basel II requirements add further complexity while provisions lower than expected losses have an impact on regulatory capital calculation. The shortfall of provisions has to be deducted for 50% on tier 1 and 50% on tier 2.

Several types of reserves are used to supplement market and credit risk not otherwise captured by an asset current price:

- Aging: a progressive reserve scale is often used with “penalties” increasing as the assets age.
- Concentration: reserves are booked on positions where financial institution holds majority of total outstanding issuance in the market.
- Model parameter uncertainty: reserves are booked in cases where there are no observable market data for inputs within the models.

5.1.1.2.2. Auxiliary roles and responsibilities

Product Control functions are constantly involved in projects, should they relate to the launch of new activities / products or regulatory requirements. Product Control functions most of the time identify a dedicated team for projects / change management. Among those:

- Implementation and interpretation of FASB and IFRS guidelines
- Information systems integration to support new products
- Basel II initiatives

As other functions, Product Control significantly contributes to data quality assurance.

5.1.1.2.3. Frontier with the Risk function

Product Control has to ensure the conditions are set to produce an accurate P/L that correctly reflects the performance and the risks of the activity. This can lead to include into Product Control some roles and responsibilities that could be under the authority of the Risk function:

- Control of operational support capabilities
- Control of positions / authorized transactions

Roles and responsibilities	Model	Product Control	Risk	Unknown	Total
Control operational support capabilities	Unified	3		2	5
	De-coupled	2		2	4
	Total	5		4	9
Control positions / authorized transact.	Unified		5		5
	De-coupled	1	2	1	4
	Total	1	7	1	9

The control of operational support capabilities aims at ensuring activities can be processed with the minimum / reasonable level of operational risk. A key challenge for many banks especially in the derivatives area is spreadsheet management. Whenever Back Office systems are unable to support the complex components of certain types of trades, manual entries have to be booked to reconcile front office spreadsheets to the Firm's books and records. The inherent risks in the reliance on these spreadsheets are in their instability as a key information source and the lack of independent control over data and calculations reported. Product Control has to ensure appropriate processes are in place to control those spreadsheets.

The control of limits and authorized transactions is generally under the authority of the Risk function. Although, the Product Control function is generally part of New Product Committees and contributes to the approval of new business.

The organization of the control of limits and authorized transactions varies among financial institutions but has been generally observed under the authority of the Risk function. Recent trends reflect a more interdisciplinary approach that helps ensure many stakeholders participate in the review process. Hence, a broader consensus in transaction approval is achieved.

5.1.1.2.4. Frontier with the Front Office function

Data quality has tremendous impact on the P/L. Ensuring completeness and consistency of data before P/L calculation is necessary and mainly done at Front Office or Middle Office level through:

- Trade support
- Referentials maintenance

Roles and responsibilities	Model	Product Control	Middle Office	Front Office	Unknown	Total
Trade support	Unified	1	3	1		5
	De-coupled		2	2		4
	Total	1	5	3		9
Referentials maintenance	Unified	1		1	3	5
	De-coupled		3		1	4
	Total	1	3	1	4	9

Referential teams are in charge of ensuring completeness and accuracy of products parameters, as well as maintaining the analytical structure.

Trade support is providing assistance to the Front Office to ensure all trades are input with the right level of detail to support processing through Operations and Accounting. Trade support is performed by traders assistants usually under the authority of the Operations function. Those are less often under the authority of the Product Control function.

The review and resolution of operations related issues is critical for Product Control, as the revenue impact of trade breaks, failed and open trades requires Product Control oversight.

Though, for as long as there are effective reconciliation processes in place, Product Control does not need to likewise perform trade support functions.

5.1.1.2.5. Frontier with the Back Office function

The Product Control function must ensure full trade capture. The review and resolution of daily breaks between Front Office and Back Office positions is essential to prevent significant P/L impact. The Front to Back reconciliations can either be performed by the Product Control function or the Back Office.

For the sake of efficiency, Front to Back reconciliations are generally performed by the Back Office, as identical breaks can also be resolved through the reconciliation with counterparties confirmations handled by the Back Office.

Roles and responsibilities	Model	Product Control	Back Office	Total
Front to Back reconciliations	Unified	3	2	5
	De-coupled	2	2	4
	Total	5	4	9

5.1.1.2.6. Frontier with the Financial Reporting function

Integrity of financial records is ultimately the responsibility of the Financial Reporting function, managing financial reporting at entities level. In compliance with Sarbanes Oxley 404, this includes ensuring the adequacy of the financial institution's internal control over financial reporting.

Although, considering the source of those consolidated reporting are under strict review by the Product Control function, some financial institutions put the preparation of financial records under the authority of the Product Control function. The Financial Reporting function is in that case more in a position of control of consistency of the financial reporting.

Roles and responsibilities	Model	Product Control	Financial Reporting	Total
Integrity of financial records	Unified		5	5
	De-coupled	1	3	4
	Total	1	8	9

5.1.2. Efficiency of the product Control processes

Product control uses data from numerous Departments and information systems (from Front Office to Back Office, Risk and Accounting). This diversity is source of complexity while designing the processes regarding data capture, transformation, control and sharing.

5.1.2.1. Interaction with other functions

Seamless interaction with other functions is essential to ensure a correct understanding of process inputs as well as timely resolution of issues.

Getting a cross-functional / transversal understanding of product control throughout the data chain (from Front Office to Finance) requires a wide range of skills (from accountants to quants and ex-traders). The demand of servicing the front office requires staff to have in-depth product knowledge and excellent communication skills. The advent of complex products and structures necessitates Product Control staff to have strong financial engineering and analytical skills. In addition, strong understanding of new regulatory and compliance requirements, valuation, are added skills expected in the current environment. Proximity with the business is critical especially for banks with newly organized Product Control functions to facilitate P/L issues resolution. Product Control staff need to be able to articulate and resolve issues in a timely manner and gain the respect of front office.

Participation to various committees facilitates the efficiency of Product Control processes, allowing:

- Shared understanding of the business: Participation to the New Products Committee provides an integrated and comprehensive view of products, markets, and support requirements across disciplines (tax, compliance, finance, etc).

- Identification of operational bottlenecks:
Product Control is a stakeholder in ensuring operational efficiency as lapses directly impact revenue reporting. The production of performance metrics escalates to management problem areas that in turn, provide impetus towards timely resolution. Most common operational bottlenecks are:
 - Overextended capacity to process trades due to increased trading volume,
 - Aged trade breaks / fails, open trades,
 - Lack of tracking mechanism over trade cancels and corrects.
- Information gathering for complex issues solving:
Product Control has a role of central repository of information for other functions. Product Control faces the Front Office on pricing and provisioning issues with regard to liquidity, market data sources, methodologies and transparency of model inputs.

5.1.2.2. Process consistency

The diversity of business lines, dedicated / non integrated information systems, manual processes for the handling of exceptions can justify specialization / division of teams and ad hoc processes within Product Control. This can also lead to process inconsistency / divergence creating inefficiencies.

A holistic approach towards business lines can bolster process performance and generate economies of scale in terms of team sizing, information systems enhancements, processing costs. This implies that all components of the Product Control function (P/L production, P/L explain, valuation, etc) should be performed, grouped and reported together. However, organization of Product Control teams by business line is very frequent. Dedicated teams are generally assigned to exotic products.

- Regular assessment of common / divergent methodologies and processes should be made to ensure opportunities of mutualization are not lost and process outputs are homogeneous enough to facilitate consolidation of reporting.
- In particular, the frontier between exotic products and other products should be defined with care to check at which point exotic products can be integrated in the standard framework.

The clear allocation of roles and responsibilities has an impact on the efficiency of the issues solving process. The split of responsibilities between several teams can contribute to unclear ownership and slow down processes. Oversight becomes very difficult as tracking information flow may not readily be transparent. Moreover, Front Office may take advantage of lapses in process management to take on trading activities at greater risk.

The most sensitive processes such as pricing not only require diligent information gathering but also experienced judgment for the most complex and illiquid assets. Ensuring the right level of expertise and mix of skills within the Product Control team is critical to keep control of those processes.

The right mix of skills should ensure the ability to:

- Perform independent price testing
 - Through access to independent third party pricing data
 - When third party data is unavailable, through coordination with Front Office to get alternate sources
- Consolidate information from other Departments (ex: Risk Management for non observable elements of pricing)
- Contain dependency versus other Departments and ability to consolidate information (ex: full understanding of all elements of pricing – observable and non observable elements)

Information systems performance is central in the efficiency of Product Control processes:

- Adequate level of detail is necessary and should be carried into the information systems right from trade input.
- Automation of processes for the production of P/L should be an ongoing effort to reduce at a minimum manual processing in spreadsheets and reduction of operational risk.
- In particular, automation of reconciliations frees up resources to allocate more time on data analysis than data crunching.

5.1.2.3. Controls execution and audit

Product Control functions having to tie economic P/L to accounting P/L, they need to ensure correctness of data throughout the processing chain from Front Office to Accounting. Control of correct data processing can be done at deal level (or blocs of deals) during execution using tracking tools, or at inventory / balance level post execution using reconciliation tools. The use of those tools considerably contributes to the efficiency of the Product Control function. Whether in charge of running those tools or not, the Product Control function will ensure any breaks / issues identified do not have P/L impact.

Tracking tools allow to identify breaks / interruptions in the process. Exception reports will give a list of actions to fix issues (ex: incomplete trade data, data inconsistencies) before end of day breaks materialize. Powerful tracking tools give the capacity to make the link between all systems from Front Office to Accounting to monitor correct processing on the whole data chain and provide a complete audit trail.

Reconciliation tools allow controls post data capture and transformation, based on inventories / balances comparison on aggregates or at deal level. They allow completeness of deal input and associated events with internal sources (between different systems in the data chain) or with external sources (ex: confirmations of counterparties).

5.1.3. Tools and applications used by the Product Control function

5.1.3.1. Sharing tools and applications with other functions

All Product Control functions of the financial institutions participating to the benchmark are only using systems shared with other functions. No dedicated systems are used, except most of them extensively use spreadsheets.

Front Office / Middle Office tools are used by Product Control for the identification of positions and their characteristics. Product Control is using portfolio and revenue characteristics to perform controls and produce reporting at various aggregation levels.

Risk Management pricing data are used by Product Control to assess the valuation of positions while performing independent price verification and to perform P/L explain through the review of price variations.

Accounting tools are used by Product Control functions depending on the extent of their functionalities:

- Basic accounting tools are used for reconciliation purpose. Daily economic P/L is produced from Front Office extractions into datamarts or Excel and reconciled to accounting P/L balances on a regular basis.
- Advanced accounting tools can manage sufficiently detailed information to be the source of both economic and accounting P/L.

The use of systems common with other functions is a factor of efficiency considering:

- Data is not duplicated between functions, preventing needs for reconciliations.
- Controls performed by each function on the source data benefits to other functions.

Considering the numerous controls and ad hoc checks that have to be performed, powerful extraction and reporting tools are used (ex: Business Objects). The use of those tools has to be monitored to make sure source data is correct and that production of manual / ad hoc reporting does not become repetitive / unmanageable.

5.1.3.2. Product Control functional requirements

More complex and numerous reporting result in the management of extensive data sets, which are not always supported by the information systems. This can result in significant manual bookings and processes bearing operational risk.

As an example, information systems have to handle several accounting standards, such as IFRS, USGAAP and Head Office accounting principles. If those can be quite well handled in parallel by accounting tools, this is not always the case for legacy systems:

- Depending on the accounting principles used, classification of assets and their pricing models can be different:
 - Some assets are classified as loans and receivables in IFRS and marked to model,
 - While they are classified as securities in USGAAP and marked to market
- In case the legacy systems can handle only one asset classification and pricing model, production of the P/L has to be adjusted with manual bookings to produce P/L reporting complying with the accounting principles considered.
- Although P/L explain can be restricted to only one of the accounting principles / standards (ex: IFRS), there can be quite some confusion ascertaining which legacy system supports what asset classification and what pricing model, resulting in operational risk.

5.1.4. Key performance indicators

Regulators regularly perform audits of financial institutions and have kept focus on the effectiveness and efficiency of the Product Control function. This can be evaluated through key performance indicators (KPIs) on the organization and processes of the Product Control function.

5.1.4.1. KPIs on organization effectiveness

In financial institutions with a unified model, the Product Control function can represent up to 50% of the Finance function and up to 4% of an investment banking institution.

The calibration of the Product Control team can vary significantly considering the automation of controls and the complexity of activities.

5.1.4.2. KPIs on activity and process efficiency

Numerous KPIs are monitored to ensure the efficiency of Product Control. Through these metrics, Management is able to gauge problem areas and prioritize needs for improvements:

- Actual versus budgeted P/L:
This activity metrics allows to assess the correctness of budget and business assumptions. Strategies are reviewed versus realized results.
- Business ratios:
 - Monitoring of win / bid ratios on new deals / underwritings
 - Comparison of margins and spreads
- Number of unsubstantiated balances:
This indicator provides visibility on the accuracy of P/L calculation with regard to operational risk and capacity to handle business development. Incorrect balances and their related P/L can significantly impact revenue especially when they are aged or unresolved. Particular attention has to be made for any increase in trend as it signals systemic breakdowns that need to be addressed.

- Number and aging of fails
- Number and aging of cash breaks and collateral breaks
- Volume, size and timing of manual / adjustment entries
- Timing of P/L production
- Number of limits sign-off
- High risks audit points
- Headcount / staff turnover

5.2. Foundations of Product Control frameworks

5.2.1. Challenges with Product Control

Whatever the organization model used, financial institutions have to assess how well their framework addresses key challenges of Product Control.

The most important challenge is to ensure clear ownership of the full Product Control tasks in order to ensure high level reliability and efficiency of the function. Clear attribution of roles and responsibilities is critical to prevent any gaps in the framework that could lead to significant inefficiencies (ex: inability to identify fraud, inability to properly calculate and explain P/L). Unclear attribution of roles and responsibilities are most seen in de-coupled models, where different Departments can shift the blame on one another.

Coming second is the ability of the Product Control framework to ensure data quality whatever the source used (Front Office, Credits, Risks, Operations, Finance). This challenge implies the ability to influence the data quality process at inception right from data capture, and to perform second levels of control on data at a cross functional / transversal level (including data tracking on the whole data chain).

Valuations and provisioning have become a tough challenge in a context of illiquid markets and forced sales due to bankruptcies or disinvestments. The lack of recent trades and available third party data has contributed to the current lack of pricing transparency. Product Control functions have had to strengthen their ability to source pricing information through alternative methods. Quantitative and communication skills have therefore been extensively exercised.

Higher Straight Through Processing (STP) has always been a keen expectation from Product Control functions:

- Manual bookings for products not fully handled by the systems have to be limited to prevent errors and operational risks.
- Data reliability and completeness has to be ensured right as early as possible in the data chain (at trade input level)

Limiting the use of unshared systems datamarts or spreadsheets from other functions / services is also a component of STP, considering the need to fully understand data transformation at each stage of the data chain.

Also linked to STP is the challenge to issue more frequent and complete reporting to provide accurate and transparent information to the markets.

5.2.2. Drivers of the Product Control models

The different Product Control organization models have been designed to address the key objectives of Product Control. They are taking into consideration several constraints such as banking regulations, evolutions of the business and corporate values of financial institutions.

5.2.2.1. The control enforcing driver vs. business facilitating driver

Product Control must provide to management an accurate daily P/L and explanations of the P/L variations in the context of their organization's business objectives and historical market experience.

This entails strict controls enforcement to correct errors, improper presentation of the results and identify frauds with P/L impact. With this perspective, some Product Control organization models are highly control oriented. Such models typically have the Product Control function as segregated as possible from the business, under the authority of the CFO.

This pre-requisite on data quality, combined with the assessment of business performance can also drive some Product Control organization models to facilitate business processing from deal capture to P/L calculation and analysis. Such models typically have the Product Control function as close as possible to the business, under the authority of the CRO or the COO.

The apparent contradiction between the need to enforce controls and facilitate the business is a founding ground for the implementation of a decoupled model. In this model, business is facilitated through some Product Control tasks under the authority of the CRO or COO, while controls are enforced through Product Control tasks under the authority of the CFO.

5.2.2.2. The commoditization driver vs. customization driver

Product Control functions are under strong pressure for timely delivery of their daily control and analysis reports. Their organization model must address this objective of efficiency.

Efficiency can be achieved through commoditization in a context where:

- Volumes require automated treatment (ex: reconciliation)
- Low complexity allows off-shoring
- High complexity justifies expertise centers set up at group level and available for all branches

On the contrary, efficiency can be better served through customization in a context where:

- The processes and products are too manual or complex to be processed without skilled intervention implying judgment
- The size of teams is limited and requires the sharing of skills to mitigate operational risk (ex: leave of a team member)

Commoditization is mostly observed in global Product Control models, where common processes and systems create opportunities of mutualization.

Customization is mostly observed in multi-local Product Control models, where business, processes and systems specificities are addressed with tailored focus.

5.2.3. Efficiency of the Product Control models











5.2.3.1. Efficiency criteria




This study analyzes the efficiency of Product Control functions through qualitative criteria. Each Product Control model and philosophy is assessed considering its capacity to produce sharp and timely outcomes.

The evaluation criteria are the followings:

- **Ability to challenge the business:**
The ability to challenge the business requires the Product Control function to understand the business strategies and products characteristics, with their impact on the P/L. It also requires independence versus the Front Office, with capacity to raise alerts and confront the Front Office on the risks and results of the activity.
- **Seamlessness of the Product Control processes:**
Product Control functions entail the combination of a large range of skills and the processing of data from Front to Accounting. Additionally to the inherent complexity of Product Control processes, the organization of roles and responsibilities can bring further complexity in the seamlessness and efficiency of Product Control processes.
- **Safety of the framework:**
The Product Control framework can be a significant source of operational risk, considering the complexity of products, the numerous applications / spreadsheets involved and the volumes of activity. Safety of the Product Control framework should be taken into consideration to assess the overall efficiency of the Product Control function.
- **Timeliness of the delivery:**
Higher volatility of the markets have strengthened the requirements of timeliness for Product Control functions. Timeliness of the Product Control outcomes is a key component of efficiency for the Product Control function.

5.2.3.2. Efficiency of the unified and de-coupled models

Assessment criteria		Unified model	De-coupled model	Comments
Efficiency on an ongoing basis	Process ownership	 + Full ownership of processes and issues	 - Risk of unclear ownership resulting in process disruption	Process ownership impacts operational risk and process timeliness
	Process fluidity	 + Little risk of loss of information as actors are under common authority	 - Difficulty to connect expertise spread between different actors	Need of collaborative governance in both models on high risk issues
	Business understanding and control	 + Ease of coordination - Risks if skills are missing	 + Leverage of expertise - Difficulty of coordination	
Ease of implementation	Change management	 - Resistance to knowledge transfer from other actors	 + Synergies of product control with other tasks of each different actor	Strategic decision requiring medium to long term investment
	Cost of implementation	 - High cost of recruitment for high level skills and large teams	 + No need to acquire new expertise	

-  Very efficient
-  Average
-  Not very efficient

5.2.3.2.1. Assessment of the unified model

The unified model is gaining momentum, with financial institutions recently shifting from the de-coupled model to the unified model. Some major financial institutions, after experiencing both models, decided to get back to the unified model for efficiency reasons.

The unified model can efficiently maximize the fluidity in the information capture and processing for the purpose of Product Control:

- An extensive scope of responsibilities in the Product Control function provides a more comprehensive understanding of the business and data chain.
- This also limits the risk of loss of information between different functions

The unified model can efficiently minimize the risk of lack of ownership on issues identified and prevent the reject of responsibility to other functions / services for not identifying / handling issues.

There are inherent difficulties in implementing the unified model, which can hamper its efficiency over a period of time:

- Other functions can resist to the implementation of a unified model to prevent losing some of their added value in the organization. Transfer of knowledge to the Product Control function can prove difficult in that case.
- Proximity with Front Office is not always readily available. Developing rapport and cooperation then becomes a challenge.

5.2.3.2.2. Assessment of the de-coupled model





The de-coupled model proves efficient leveraging on the skills of several Departments and bringing out in-depth expertise and understanding of issues.

Good coordination and communication between the different actors of the Product Control function are keys to ensure efficiency of de-coupled models. Unclear ownership of roles and responsibilities between the Risk, Middle Office and Finance functions can lead to process disruptions and slowdowns in the issues solving.

With several players involved, experience showed a tendency to serve business first and lose the link with the back-end of the data chain in the Finance Department:

- Consistency between economic P/L and accounting P/L tends to be of lesser focus
- Finance ends to end up with a too much generic understanding of activities to have a critical opinion on the activity for the purpose Product Control

5.2.3.3. Efficiency of the global and multi-local models

Assessment criteria	Global model	Multi-local model	Comments
Efficiency on an ongoing basis	 + Ability to develop expert groups for complex products - Concentration of skills at group level with risks of missing expertise in branches	 + Good understanding of local specific products and regulations - Weak branches less tightly controlled	Control / cost effectiveness to be assessed with regards to products complexity and centralization of information systems
Ease of implementation	 + Capacity to identify economies of scale + Capacity to better identify top priorities	 - Duplication of efforts and low chance to benefit from economies of scale	

5.2.3.3.1. Assessment of the global model

The global model gives a strong leadership of the Product Control function to Head Office. Its benefits are measured in the capacity to develop expertise and identify economies of scale:

- Specialized groups can be set up at Head Office for complex processes that can be accessible to all branches
- The capacity to seize the characteristics of the activity on a global scale allows to prioritize initiatives (ex: data quality projects) and identify the breaking point for re-organization initiatives (ex: reach of the appropriate volume for further automation / off-shoring).

The global model can tend to centralize most of the expertise at Head Office and large branches. Other branches can end up less effective and autonomous, leaving space for higher level of operational risk and less accurate reporting.

5.2.3.3.2. Assessment of the multi-local model

Multi-local models allow greater level of autonomy to branches than the global model. Chances of better understanding local products / activities are higher, with favorable impact on the ability to identify issues and on the accuracy of reporting.

However, global overview on the Product Control framework can prove difficult:

- Head Office might have difficulties consolidating Product Control reporting,
- Weaknesses in the expertise and Product Control framework might be less visible and quickly addressed, leaving room to operational risk.

As well, economies of scale can be missed while some functions are duplicated between several branches, increasing the overall operating costs for the Product Control function.

5.3. New trends in Product Control

The increase of regulatory constraints with strong focus on controls and regulatory supervision is leading Product Control functions to strengthen their framework. New goals are set, bringing new trends in terms of organization of the function.

5.3.1. New goals for Product Control functions

5.3.1.1. Evaluation of level 3 assets

Confronted to inactive markets or distressed sales, financial institutions have had to classify a more significant part of their portfolio as level 3 assets, as per the FAS 157 definition. Estimating their value requires inputs that are unobservable and reflect Management assumptions.

Considering the P/L impact, Product Control has a leading contribution in the estimation of the level 3 assets fair value. Strong capacity of judgment is required to assess all assumptions and determine the exit price.

5.3.1.2. Integration of IFRS

Although already in place in financial institutions with European Head Quarters, American based financial institutions will have to implement IFRS as soon as 2009 for early adopters and 2014 for other adopters (including 2 years in arrear comparative financial statements).

IFRS regulations have a firm-wide impact in terms of process re-engineering, Product Control functions being at the epicenter of the framework definition and implementation. Product Control functions will have to be able to control valuations and produce P/L considering both US GAAP and IFRS.

5.3.1.3. Integration of Basel II reporting

Increased difficulty in raising capital and liquidity leads financial institutions to better manage their capital allocation. The analysis of Basel II reporting is progressively included in the review of the performance of Business Lines by Product Control functions.

The need to ensure the accounting consistency of Basel II figures (including with provisions) can efficiently be managed by Product Control functions. Experience also proved the difficulty to gather sufficiently cross-functional / transversal knowledge for Basel II analysis, which Product Control functions can probably handle best.

5.3.1.4. Increased frequency of reporting

The extreme levels of volatility of the markets since the 2008 financial crisis triggered the need to quicker adjustment of strategies and therefore to more frequent / accurate / relevant reporting. To face this challenge, Product Control functions can either:

- Increase the level of automation of reporting
- Commoditize / specialize control tasks
- Enhance communication with other functions whenever those are implied in a Product Control process

5.3.1.5. Responsibility of guaranteeing data quality

Ensuring data quality has always been an important objective assigned to Product Control functions in collaboration with other functions such as Operations. The new market conditions and increased revelations of frauds put an even stronger focus on this objective. Product Control has a key role to play in this regard, considering its cross-functional / transversal involvement in P/L data analysis.

Holistic vision of controls performed from Front Office to Accounting gives legitimacy to Product Control functions to lead interdisciplinary groups in escalation of issues to Executive Management:

- Product Control becomes the main driver in establishing regular meetings with Front Office and control groups (Compliance, Risk Management, Operations) to identify, assess and exit risks on the activity. More particularly, Product Control is taking the lead in discussions on the oversight of level 3 assets.
- Although strong finance skills remain at the core of Product Control staff, quantitative, audit and compliance skills are further needed to face tougher conditions of activity.

5.3.2. Leading edge in Product Control

Facing those new challenges, Product Control functions are constantly assessing their framework to gain in efficiency.

5.3.2.1. Commoditizing and off-shoring

Off-shoring of the commoditized processes of Product Control functions has been a significant initiative for most of the global financial institutions. This was born out of increased pressure to deploy to low cost centers where salary levels are dramatically lower than in on-shore locations. Local product control functions tend to shrink in size and get connected to off-shore centers for commoditized functions that do not need to be close to Front Office.

Functions are deployed in several offshore locations based on time differences for most optimal results: Europe to Asia, US to North Carolina, Florida:

- Production of P/L:
Cash products are most easily deployed as the process is more straightforward.
- Pricing based on models:
Cash products and more liquid derivatives are most likely candidates for deployment. Direct pricing feeds (i.e. bond prices, curves) can be readily automated and performed offshore.

5.3.2.2. Strengthening governance on valuation

In banks where Product Control functions are more developed, Product Control is responsible for ensuring that models supporting valuations for new business or existing inventory are reviewed. All models are logged and catalogued for regular updates and reviews.

While models used to be reviewed annually, market volatility puts pressure for more frequent reviews and stress testing, to ensure extreme variations have been considered. This ensures current market data, and market variations have been factored in the analysis.

The emerging governance reflects regularly scheduled escalation forums involving senior management as well as various control and peer review groups (Product Control, Credit and Risk Management, other traders from different products). Focus is centered on highlighting Level 3 assets, their valuation approach and the exit strategy for these assets. The mark to market level of these assets is assessed and markdowns are reported in a timely manner.

A closer relationship between Product Control and Risk Management has been growing in recent years. Indeed, Risk Management relies heavily on the P/L information to run stress testing and VaR calculations. P/L results are correlated by Risk Management to back testing results to ascertain if Front Office is accurately reporting their P/L vs. market movements.

6. Conclusion

Financial institutions undoubtedly are promoting the unified and global models as structurally more fit to face the challenges of Product Control in a financial crisis environment:

- Financial institutions have to secure their reputation, some of which have been hit by serious frauds or losses due to uncontrolled levels of risks. Unified and global models give them the ability to eradicate loopholes between the various control layers through a more holistic monitoring of activities.
- Refocusing on their core business, financial institutions take the opportunity of group wide restructurings to rationalize all teams including Product Control. Unified and global models are favored as facilitating synergies to improve performance and reduce costs.

However, the unified and global models can be difficult to implement and costly in terms of team size. Restricting them to the core Product Control functionalities can be an option, those bringing most of the expected synergies.

Whatever the Product Control model, its efficiency mainly lies in its conditions of implementation:

- Intense and transparent communication is necessary to coordinate all the skills involved in Product Control, should they be unified or decoupled into several authorities.
- Ability of the Product Control function to influence business decisions and drive change should not raise any doubt.

Indeed, Product Control functions can only be effective in a control prone environment. As an illustration, before the Madoff scandal was revealed, alarms were raised by U.S. lawmakers and fraud investigators for years, but ignored by the SEC.

The effectiveness of Product Control functions lies in a large extent on the support of Executive Management that must be open to red flags and demonstrate the willingness to take appropriate and timely action.