

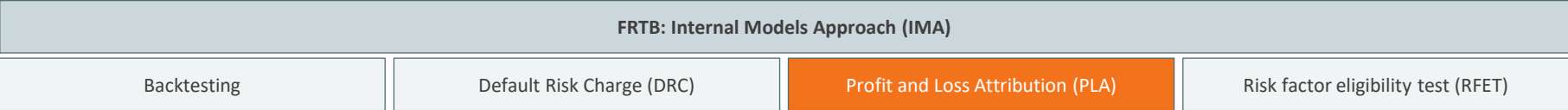


Fundamental Review of the Trading Book (FRTB)  
Profit and Loss Attribution (PLA) Analytics

# PLA Analytics

## Overview of PLA

FRTB requires banks to assess the similarity between Front Office (FO) and Risk P&L (HPL and RTPL) on a quarterly basis. Desks which do not pass PLA incur capital surcharges or may, in more severe cases, be required to use the more conservative FRTB standardised approach (SA).



### What is the purpose of PLA?

- PLA ensures that the FO and Risk P&Ls are sufficiently aligned with one another at the desk-level.
- The FO HPL is compared with the Risk RTPL using two statistical tests.
- The tests measure the materiality of any simplifications in a bank's Risk model compared with the FO systems.
- In order to use the IMA, FRTB requires each trading desk to pass the PLA statistical tests.
- Although the implementation of PLA begins on the date that the IMA capital requirement becomes effective, banks must provide a one-year PLA test report to confirm the quality of the model.

### What are the consequences of failing PLA?

#### Capital Increase

- Desks in the red zone are not permitted to use the IMA and must instead use the more conservative SA, which has higher capital requirements.
- Amber desks can use the IMA, but must pay a capital surcharge until the issues are remediated.

#### Difficult to return to IMA

- Desks which are in the amber or red zone must satisfy statistical green zone requirements and 12-month backtesting requirements before they can be eligible to use the IMA again.

### Which statistical measures are used?

- PLA is performed using the Spearman Correlation and the Kolmogorov-Smirnov (KS) test using the most recent 250 days of historical RTPL and HPL.
- Depending on the results, each desk is assigned a traffic light test (TLT) zone, where amber desks are those which are allocated to neither red or green.

TLT Zone	Spearman Correlation	KS Test
Green	> 0.80	< 0.09
Red	< 0.70	> 0.12

### What are some of the key reasons for PLA failure?

#### Data issues

- Data proxies are often used within Risk if there is a lack of data available for FO risk factors. Poor or outdated proxies can decrease the accuracy of RTPL produced by the Risk model.
- The source, timing and granularity also often differs between FO and Risk data.

#### Missing risk factors

- Missing risk factors in the Risk model are a common cause of PLA failures.
- Inaccurate RTPL values caused by missing risk factors can cause discrepancies between FO and Risk P&Ls and lead to PLA failures.

# PLA Analytics

## Identifying sources of PLA failures

Although the PLA statistical tests are simple to execute, many banks struggle to identify the causes of differences between HPL and RTPL. This risk factor identification process is critical as it allows failing desks to remediate underlying issues and reduce capital requirements in the future.

### Roadblocks to finding the sources of PLA failure

#### FO and Risk mapping

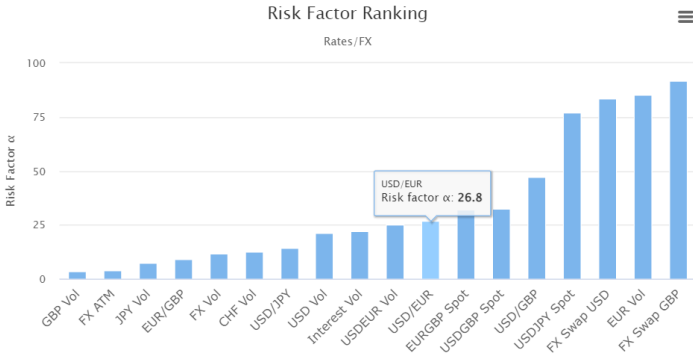
- Many banks face difficulties due to a lack of accurate mapping between risk factors in FO and those in Risk.
- For example, multiple risk factors in the FO systems may map to a single risk factor in the Risk model. More simply, different naming conventions can also cause issues.
- The poor mapping can make it difficult to develop an efficient and rapid process to identify the sources of P&L differences.

#### Lack of Existing Processes

- PLA is a new requirement which means there is a lack of existing infrastructure to identify causes of P&L failures.
- Although they may be monitored at the desk level, P&L differences are not commonly monitored at the risk factor level on an ongoing basis.
- A lack of ongoing monitoring of risk factors makes it difficult to preempt issues which may cause PLA failures and increase capital requirements.

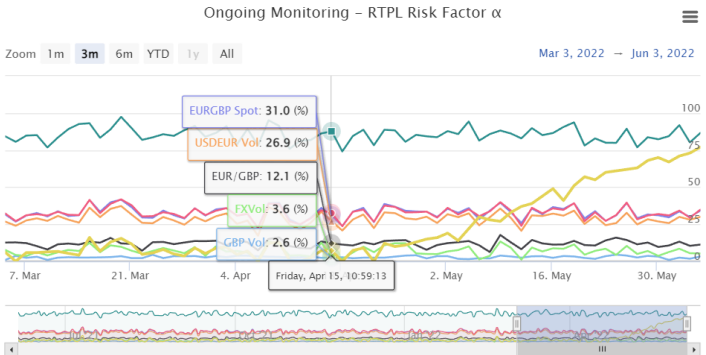
### Our approach: Identifying risk factors that are causing PLA failures

- Fintegral’s approach overcomes the above issues by producing analytics despite any underlying mapping issues between FO and Risk P&L data.
- Using our algorithm, risk factors are ranked depending upon how statistically likely they are to be causing differences between HPL and RTPL.
- Our metric, known as risk factor ‘alpha’, can be tracked on an ongoing basis, helping banks to remediate underlying issues with risk factors before potential PLA failures.



*Left: Our tool ranks risk factors and simplifies the process of identifying the causes of P&L differences.*







*Right: Risk factors can be continuously monitored and the sources of FO/Risk modelling differences can be seen over time.*



# PLA Analytics

## Key features and benefits of our solution

Fintegral's P&L attribution solution has been implemented at a Tier-1 bank, providing the necessary infrastructure to identify problematic risk factors and improve PLA desk statuses. The solution provided multiple benefits to increase efficiency and transparency of workstreams at the bank.

	Overcomes mapping issues 	Utilises early warning system 	Aggregates at different levels 
Features	Problematic risk factors, which are causing differences in RTPL and HPL, are identified regardless of any potential mapping issues between risk factors in the FO and Risk.	Risk factors are monitored on an ongoing basis and those which have a high chance of causing PLA failures are flagged as early as possible.	Analysis can be performed for all risk factors across all trading desks and results can be aggregated at different levels, such as desk, business area and asset class.
Benefits	It is easier to compare P&Ls at the risk factor level. Analysis at the risk factor level is necessary for banks to find the sources of PLA failures and remediate them accordingly.	Provides pre-emptive remediation of model issues and reduces the chances of trading desks incurring capital surcharges or losing their IMA eligibility.	It is easier to identify and remediate systemic issues with risk factors, which could be subtly affecting numerous desks and be causing high levels of capital surcharges.
	Enriches results with bank data 	Automates identification process 	Provides transparent results 
Features	Available bank data and metadata, such as time zone and geographical, timeseries proxying, and RNIV information, are used to enrich results and provide better insight.	The results can be calculated on a daily basis and risk factors are ranked automatically depending upon how statistically likely they are to be causing differences between HPL and RTPL.	An interactive dashboard enables users to investigate and monitor risk factors across all trading desks and presents key information in a simple to interpret and concise manner.
Benefits	Helps to identifying potential reasons for problematic risk factors, such as highlighting risk factors which also have a timestamp difference in their P&Ls.	Reduces any unnecessary time and effort spent producing ad-hoc and manual analysis to understand the sources of PLA failures.	Can be viewed and used by multiple stakeholders (such as risk managers, model developers and senior management), increasing transparency and helping to efficiently remediate problems.



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