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Bank for International Settlements
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via email to: fsb@bis.org

12th September 2013

To: The Basel Committee,

We welcome this opportunity to comment on the consultative document issued by the Financial Stability Board in July 2013 entitled 'Principles for an Effective Risk Appetite Framework' (RAF Paper)[1].

The RAF Paper observes that "effective risk appetite frameworks (RAFs) that are actionable and measurable by both firms and supervisors have not yet been widely adopted" and recommends that "supervisors discuss expectations for what a 'good' risk appetite framework entails". [2]

More than an 'expectation', our view is that an effective risk appetite framework cannot exist unless it is derived from a common risk exposure measurement framework that is also used in the determination of firms' capital requirements and the pricing of risk inherent in financial products.

If it is to be both meaningful and effective, the outputs of such an exposure measurement framework must be:
  I.   directly responsive to changes in the causal factors that affect firms' exposure to risk;
  II.   available or accessible in real-time or near real-time;
  III.   tied to firms' accounting records;
  IV.   based on calculations of exposure to risk that are, or can become intuitive;
  V.   directly comparable across and between diverse operating environments and enterprises; and

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[1] Financial Stability Board, *'Principles for an Effective Risk Appetite Framework'*, (July 2013), http://www.financialstabilityboard.org/publications/r_130717.pdf accessed on 4th September 2013
[2] See footnote 1, page 1

VI.   validly additive and aggregatable by risk type and other reporting categories typically used in firms' management information systems, e.g. business lines, organizational units, products, customers, geographies etc.

The setting of a firm's risk appetite and its monitoring against dynamically evolving exposures to risk is analogous to a firm's financial planning and budgeting whereby related processes are connected through a common understanding of core methodologies, i.e. transfer pricing, unit costing, net-present-value of future costs and earnings, etc. and a common unit of measurement, that being monetary value in the firm's base currency. The absence of a similar set of core methodologies and a common unit of measurement applied to risk appetite means that financial firms, their investors and supervisors have no readily accessible, comparable and actionable set of measurement-based metrics through which they can determine how much risk a firm has taken on an absolute basis or in comparison to others or whether it is operating within the risk appetite limits approved by their boards of directors.

Our proposed framework, the product of our on-going research, in which these requirements are addressed, is termed 'Risk Accounting'; an overview is provided in the appendix and is described in more detail in published research papers and academic working papers[3].

Risk Accounting supports the dynamic quantification of exposure to risk using a method in which the intellect, experience and expertise of firms' management and supervisors are embedded in the exposure measurement framework. It uses a common additive unit of risk measurement - the 'Risk Unit (RU)' - that enables the direct comparison of its outputs within and between diverse operating environments and enterprises.

Inasmuch as Risk Accounting is an extension of management accounting its outputs are fully aligned to existing management information systems and financial plans and budgets.

We are engaged in other aspects of research allied to risk appetite setting, each of which build on the other and forms a holistic approach to risk adjusting the financial system:

- 'Risk Accounting'... the convergence of accounting and risk management systems within a common enterprise exposure measurement framework
- 'Global identification Standards'... starting with the Legal Entity identifier (LEI) used to aggregate counterparty exposures across the industry
- 'Big Data' ... intelligent semantic networks for systemic risk analysis

We look to the Financial Stability Board to provide its bully pulpit to advocate for our cause which we suggest should be its own. In this regard we believe the Risk Accounting technique described in the

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[3] Grody AD, Hughes PJ, Fernandes KJ, Phillips O, and Toms JS, *'Risk Accounting: An Accounting Based Approach to Measuring Enterprise Risk and Risk Appetite'* (October 20, 2012). Available at SSRN: http://ssrn.com/abstract=2165034, and Hughes P, Grody AD, Toms JS, 2010, *'Risk Accounting – a Next Generation Risk Management System for Financial Institutions'*, The Capco Institute Journal of Financial Transformation, 29 (1): 43-56

appendix not only provides the foundation that enables the realisation of the FSB's expectations for the adoption of effective risk appetite frameworks but also meets the Basel Committee's recently published risk data aggregation and risk reporting requirements[4] and its aim of achieving a more appropriate balancing of risk sensitivity, simplicity and comparability in the regulatory framework[5].

Yours sincerely,

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[4] Basel Committee on Banking Supervision, *'Principles for Effective Risk Data Aggregation and Risk Reporting'*, (January 2013)
[5] Basel Committee on Banking Supervision, *'The Regulatory Framework: Balancing Risk Sensitivity, Simplicity and Comparability'*, (July 2013)

Risk Accounting - Overview

Risk Accounting is a next generation Enterprise Risk Management system[6]. It addresses the weaknesses and limitations in banks' risk management and accounting systems that failed to provide forewarning of life-threatening accumulations of exposure to risk that formed the backdrop to the financial crisis.

Risk Accounting introduces a simple, consistent and auditable method of measuring and reporting enterprise risks as an extension of management accounting. It comprises three categories of tables and templates that assign standardised risk-weights to individual transactions according to:

1. The risk characteristics of the relevant products
2. The amounts (quantities and values) accepted for processing in accordance with accounting records
3. The risk mitigation effectiveness of the operating environment that processes them

The risk-weights tagged to each transaction are used in a calculation of its exposure to risk. In this way, Risk Accounting accounts for the risk exposures inherent in financial transactions and produces risk reports that can be aggregated by risk type (credit, market, liquidity and operational) and by organisation, geography, product and customer.

Risk Accounting's tables and templates are built from the ground up incorporating the expert knowledge of line and risk management which becomes embedded in the very fabric of the risk measurement method. The result is risk metrics that are both credible and actionable allowing a risk culture to naturally evolve with continual risk mitigation as the outcome.

Risk Accounting's standard unit of risk measurement – the Risk Unit (RU) – blends quantitative and qualitative risk elements into a single additive metric that can be used in the setting and monitoring of risk appetite.

Real-time management dashboards facilitate the management of risks by exception – primarily risk appetite excesses – enabling analysis of the causes by drilling to the relevant products and related processes.

How Exposure to Risk is Created

An operating environment can be deconstructed into the simple model shown on the next page represented by three key operational pillars – people, data, and systems. If the interaction of the three

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[6] See footnote 4

operational pillars (manual process, automated process, and data) is flawless a theoretical risk-free operating environment is the result. Thus, the benchmark for a risk-free operating environment can be represented as 100 per cent straight-through-processing (STP) with totally reliable and secure information technology and flawless data.
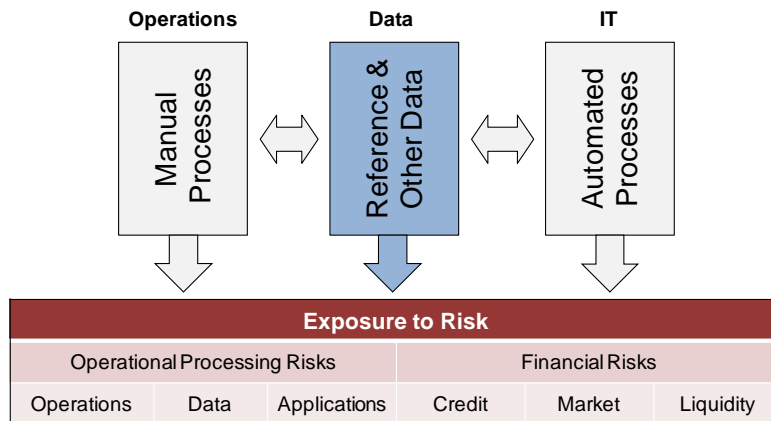
The Three Pillars of an Operating Environment

This benchmark also represents a transaction processing environment that is operating at or close to optimal efficiency. Consequently, the correlation between risk mitigation effectiveness and operating efficiency is '1' or close to '1'.

It follows that exposure to risk, and the loss of operating efficiency, are the consequence of the failed and/or insecure interaction of manual and automated processes with data related to the processing of transactions and the management of financial risks. The risk metrics produced by Risk Accounting are aligned to this dynamic.

The Risk Unit (RU) – Three Core Metrics

The risk quantification method involves the production of three core metrics using the new common unit of exposure measurement unique to Risk Accounting... the 'Risk Unit' (RU):

Inherent Risk – is the risk-weighted size of a transaction expressed in RUs that represents the transaction's maximum potential for loss

Risk Mitigation Index (RMI) – is a dynamic measure on a scale of 1 to 100, where 100 is best practice, that represents, in percentage terms, the portion of maximum potential loss that is mitigated through the effective management and control of the firm's operating environment

Residual Risk – is expressed in RUs and represents the probability of loss of that portion of Inherent Risk not covered by effective risk mitigation as represented by the RMI

The above core metrics are calculated at the transaction level related to the risk types that are triggered by a transaction. These risk types can be one risk type or a combination of operational, credit, market and liquidity risks. The resulting metrics can be aggregated, for example, by organization, product, customer, geography and risk type.

Preventing Unexpected Losses

In Risk Accounting the amount of risk inherent in a transaction accepted for processing is related to its potential to cause unexpected losses. An unexpected loss can be prevented through a firm's effective monitoring and management of the associated risks, which is precisely what Risk Accounting is designed to facilitate.

An unexpected loss occurs in circumstances where a firm's management believes its risk management processes are effective but, in reality, they are not due to failures either in their design or application. It follows that an unexpected loss cannot result from a firm intentionally taking on a risk for a projected return if the decision to accept such risk is a consequence of the application of effective risk management processes represented by a high Risk Mitigation Index (RMI) and within approved risk appetite parameters. In Risk Accounting risk appetite is also defined in RUs.

The Value Table

The Value Table consists of value bands and associated risk-weights (Value Band Weightings). The resulting logarithmic curve shown in the table below depicts the relationship between transaction values and risk, i.e. the marginal increase in risk reduces as transaction (processing) values increase. This is due to the natural increase in the sophistication of processing that occurs when transaction throughput increases due, primarily, to enhanced automation. The value bands adjust dynamically to the product volumes and values being processed and are scaled accordingly.
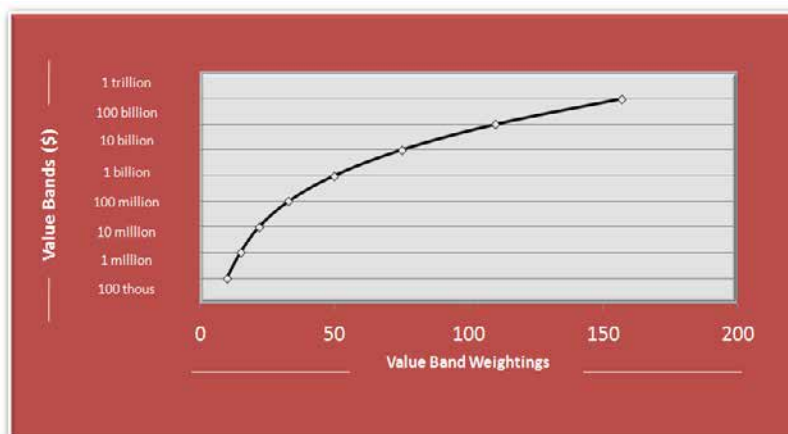
Value Band Weightings

Financial Risks and Exposure Uncertainty Factors (EUFs)

Risk Accounting introduces a new concept in risk quantification... the Exposure Uncertainty Factor (EUF). The EUFs presented in the table below assume that there is a positive correlation between a product's potential to cause unexpected losses and the degree of exposure uncertainty that exists, for example, upon the assumed occurrence of a credit default (credit risk) or if a trading position were to be unwound on any given day (market risk).

Credit Type	Form of Security / Type of Instrument	EUF
Commercial	Casual Overdraft	2
Commercial	Credit Card	2
Commercial	Unsecured	2
Commercial	Cash	4
Commercial	Cash Like Instruments (Margins, Liquid AAA Collateral)	5
Commercial	Trade Receivables	8
Commercial	Inventory	12
Commercial	Equipment	12
Commercial	Instruments Subject to Mark-to-Market, Mark-to-Model	12
Commercial	Autos	12
Commercial	Personal Guarantee	14
Commercial	Project Financing	16
Commercial	Commercial Real Estate	18
Counterparty	Forward Foreign Exchange	4
Counterparty	Interest Rate Swaps	8
Counterparty	Options	8
Counterparty	Credit Default Swap	14
Counterparty	Collateralized Debt Obligations and Asset Backed Securities	18
Retail	Casual Overdraft	2
Retail	Credit Card	2
Retail	Unsecured	2
Retail	Autos	12
Retail	Personal Guarantee	14
Retail	Residential Property	16

Credit Risk – Exposure Uncertainty Factors (EUFs)

Research has demonstrated that the EUF offers a more reliable basis on which to calculate forward looking exposures to risk than the more backward looking risk models – such as Value-at-Risk (VaR) – that rely on historic loss data to predict the probability and severity of future unexpected losses.

For example, exposure uncertainty related to credit risk is a function of a credit's underlying collateral by reference to its value retention properties and degree of anticipated difficulty in arriving at a liquidation price upon disposal.

Credits secured by collateral with a high EUF carry correspondingly high inherent credit risk. This is due to their exposing a firm to greater probability of unexpected losses because credits that are deemed secured may become partially or wholly unsecured due to an inherent susceptibility to changes in the value and/or availability of the collateral and/or difficulty in liquidating the assets.

Conversely, an unsecured loan has a low EUF and a correspondingly low inherent credit risk as the true exposure at default can be readily determined.

Transaction Processing Risks

Upon their acceptance for processing, transactions follow a predetermined path through the operating environment. This path is represented by operations units that perform certain activities relative to the transactions, for example, data capture, release of values (payments), reconciliation, independent checking, valuation (mark-to-market), imaging, placing/removing into/from safekeeping and many more.

Operational activities have varying degrees of inherent risk. For example, an activity that releases collateral or cash to third parties is inherently riskier than imaging a document. The criteria applied in determining the degree of inherent risk is 'loss immediacy'. If an operational process is faulty the occurrence of a loss is more likely if the loss is immediate upon the faulty activity being executed.

Activity Type	Activity Description and Examples	Weighting
General Administration	General administration − Imaging − Filing − General support	1
Nostro Investigation	Investigation, aging and escalation of unmatched items	6
Payments / Settlements	Release value items (including standard settlement instruction and standing order / direct debit maintenance) to: − Guaranteed counterparties − Intercompany and intracompany − Guaranteed settlement (e.g. central exchanges / Continuous Link Settlement) − Delivery versus payment agreements	2
	Release value items (including standard settlement instruction and standing order / direct debit maintenance) to: − To financial market counterparties − Banks and other financial institutions	5
	Release value items (including standard settlement instruction and standing order / direct debit maintenance) − Other parties − Non-financial market counterparties − Third parties	10

Operational Activity Catalogue (Extract)

Research to date has identified 34 such operational activity types that have been catalogued and a relative risk weighting assigned.

An extract from the operational activity catalogue is shown above. Risk Accounting uses these risk weights in the calculation of inherent risk RUs relative to individual transactions.

Best Practice Scoring Templates (BPSTs)

BPSTs are used to calculate the Risk Mitigation Index (RMI) which is a measure of the risk mitigation (loss prevention) effectiveness of the operating environment.

Credit Assessment & Approval	
Relates to assessment and approval processes applied in credit-granting decisions	
Best Practice Score = 100 Points	
Best Practice Statements	**Deductible Points**
1. The firm's approved credit risk management procedures set out the credit-granting processes and documentation standards that must be complied with when assessing and approving credits	100
2. The firm's approved credit risk policies set out credit-granting criteria encompassing the individuals and organisations that are eligible for credit (exclusive and inclusive), the terms and conditions and the amounts and types of credit that can be transacted. This is followed for every credit approval	100
3. While assessing credit proposals for an obligor, complete and accurate aggregate exposures of related parties are available for evaluating the overall risks including concentration risks	70
4. Specialist credit analysts, who are assigned to a business line but report independently of the management of business origination personnel (sales), analyze and approve credits and have the authority to amend the internal credit risk ratings (downgrade or upgrade) assigned by business origination personnel (sales)	60
5. The firm relies on its own independent credit assessment and analysis of each obligor even if third party credit assessments and/or ratings are available	50
6. Credits outside of business 'strike zone' require approval by an independent credit review function	40
7. Each obligor is assigned an internal credit risk rating by personnel who are sufficiently knowledgeable of the obligor's circumstances to reliably conclude on repute and creditworthiness and are suitably expert[3] in credit analysis and assessment	40
8. Personnel who have been assigned lending authority can approve credits up to predetermined limits based on a combination of pre-defined parameters including internal credit risk rating and the amount of credit being granted	40
9. Override of system generated internal risk ratings is done only by credit personnel with authorities for overrides; reasons for override are documented as a part of the credit approval	40
10. In addition to credit approvals, for credits where the *Risk Adjusted Return on Capital (RAROC)* is lower than the hurdle rate as per pricing policy, separate pricing approvals is required by personnel independent of the business origination personnel (sales)	20
11. The organization has standardized templates for credit analysis (including financial analysis) to minimize variance in credit assessment process	20
12. As a part of credit approval process all obligors are subject to Know Your Customer (KYC) background checks as required by regulations applicable to the organization	20
13. Credit approval workflow automatically ensures that the proposal is routed to the correct level of credit personnel for approval. Exceptions are immediately triggered for action	10

Sample Credit Risk Best Practice Scoring Template

A primary input to BPSTs are the 'effective principles' and 'sound practices' papers published from time-to-time by the Basel Committee on Banking Supervision.

BPSTs have been developed for each risk type and comprise generic and risk specific templates. For example:

- Generic BPSTs include People, Controls, Execution and Business Recovery
- Risk specific BPSTs include, for credit risk, Credit Assessment & Approval, Credit Quality Assurance & Monitoring, Credit Risk Administration and Credit Risk Model Management
- Operational (transaction processing) risk comprises Manual Processing (Operations), Automated Processing (IT) and Data Management.

On the preceding page is a sample BPST for Credit Assessment & Approval. The 'deductible points' represent the relative degree of reliance that management places on the respective best practice when designing and applying credit risk management processes.

In deriving a best practice score for 'Credit Assessment & Approval' relative to a product, scoring begins with the maximum '100' and for each best practice that is not complied with the respective 'deductible points' is deducted cumulatively from the maximum '100'. A resulting score can be zero but not less than zero.

Risk Accounting - Process Overview

The diagram below relates to financial risks (transaction processing risks are not shown). It describes the flow of transaction data from the general ledger through the various tables and templates that comprise the Risk Accounting method and system.
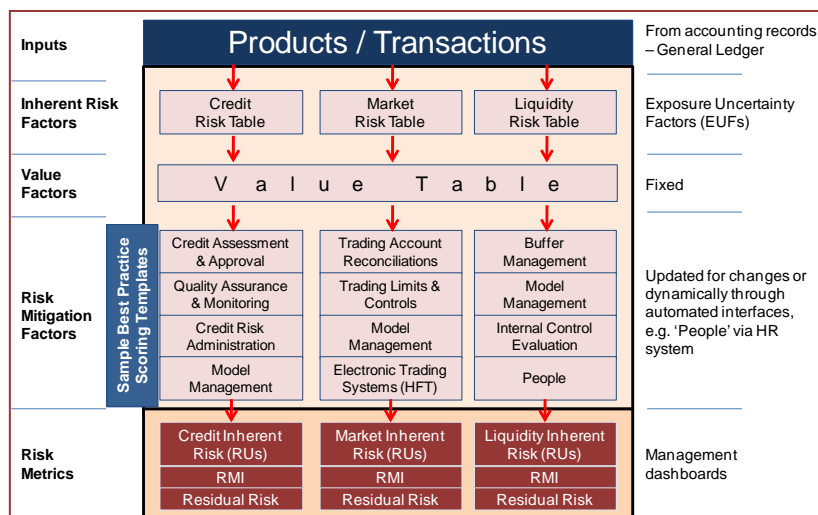
Risk Accounting Process Flow – Financial Risks

Reporting

Risk Accounting is designed to identify and quantify external exposures to risk from two perspectives:

1. The amount of new exposures to risk created during a particular day ('Daily New Exposures')
2. The amount of risk inherent in risk positions at a given point in time ('Risk Positions').

The transactions that comprise 'Daily New Exposures' and 'Risk Positions' are derived from, and are traceable to the firm's general ledger and its associated product sub-ledgers and applications. It thus satisfies the Committee's requirements that risk data should be reconciled to accounting data[7].

The amount of 'Daily New Exposures' related to credit risk is determined for each product by reference to the total amount of loans disbursed, guarantees approved, etc. Where credit risk is not the result of a loan disbursement, e.g. casual overdrafts, credit card outstandings etc., the net day-to-day increase in total outstandings of the respective portfolio is considered to be the new daily credit exposures.

For market risk 'Daily New Exposures' is the aggregate trades (buys and sells) and related hedges relative to each trading position on the principle that abnormally high trading volume is an indicator of higher risk. Such activities should be reflected in management reports albeit adjusted by the applicable Exposure Uncertainty Factor (EUF) discussed above. Aggregate values are also applied to the products and related hedges that comprise a market risk 'Risk Position'. A high EUF is an indication of the probability that these products and associated hedges, while validly combined and netted in a single trading position, may not provide the intended risk management effect if liquidated in stress conditions.

Transaction size is another factor in the calculation of RUs inherent in credit and market risk as a transaction's size (value) and the amount of unexpected loss it can potentially create are positively correlated.

In the case of market risk and counterparty credit risk with respect to derivatives, Risk Accounting considers that the notional values are representative of transaction size as they provide the basis on which future cash flows, mark-to-market and mark-to-model calculations, collateral deposits and related gains and losses are determined. When calculating the exposure in RUs inherent in 'Risk Positions' for both credit and market risk, Risk Accounting uses fair values or market values in accordance with accounting principles as these more accurately reflect the outstanding amounts.

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[7] See footnote 4

A Better Method for Regulators and Investors

The product risk report shown on the following page provides an example of an output of Risk Accounting describing the inherent and residual risks of a financial product; in this case, a Collateralized Debt Obligation (CDO). The interpretation applied in this example is that the inherent risk (4,650 RUs) is representative of the maximum potential for loss inherent in the CDOs transacted on a particular day and the residual risk (2,166 RUs) is representative of the respective probability of loss.

Over time, Risk Accounting outputs will be correlated with expected and actual losses thereby imparting a monetary value to the RU. In the interim, benchmarking RUs across financial institutions that are adapting to the Risk Accounting method will provide relative standing of the RUs' value to improving best practices and thereby mitigating risks.

Inasmuch as the Risk Accounting method quantifies inherent and residual risk in RUs relative to each product transacted by a financial firm, it follows that such information can be validly applied in the calibration of regulatory capital requirements. The expectation is for the RU metric, over time, to assume a statistically derived monetary value considering that the RU incorporates all of the principal risk types (credit, market, operational and liquidity).

For this potential to be realized it is acknowledged that the tables and templates that constitute the Risk Accounting method and system will need to be standardized across the industry, not unlike the prescriptive accounting standards disseminated as International Financial Reporting Standards (IFRS) that are designed to ensure, amongst other aspects, the comparability of firms' audited financial statements.

The benefits are, however, potentially significant for regulators as capital requirements based on RUs will be the result of explicit measurements of exposure to risk following auditable processes. Investors and other stakeholders will similarly derive benefit as they will be able to directly compare the level of risk accepted by a firm both absolutely and in comparison to others.

A final benefit is that the process of implementation creates reengineering and cost reduction opportunities, metricized in RUs for risk reduction and in monetary values for profit performance enhancement. It has been our experience in our pilots that the one-time cost for implementation is offset by the cost savings from reengineering, and that the annual savings then persist, making Risk Accounting a multi-year bottom line benefit on a ROI basis.

Collateralized Debt Obligations (CDOs)	Inherent Risk (Risk Units)	Risk Mitigation Index (RMI)	Residual Risk (Risk Units)
Processing Risks			
Transaction Processing Risk			
Product & Service Pricing	1,350	63.5	493
Deal Structuring	1,350	55.2	605
Order Management	1,350	68.2	429
Pre-Trade Validation	1,350	62.3	509
Quote Management	1,350	73.4	359
Trade Execution & Capture	1,350	44.9	744
Cash Management	1,350	52.3	644
Trade Confirmation & Matching*	1,350	60.0	540
Position Control & Amendments	1,350	60.2	537
Transaction Reporting	1,350	63.2	497
Credit Limit Monitoring	1,350	45.0	743
Trading Limit Monitoring	1,350	62.4	508
Trade Settlements	1,350	63.4	494
Nostro Reconcilement	1,350	72.8	367
Trading Account Reconciliations	1,350	66.7	450
G/L Proofs & Substantiation	1,350	73.3	360
Management Reporting	1,350	64.2	483
Regulatory & External Reporting	1,350	64.2	483
Control Totals	24,300	62.0	9,245
Transaction Processing Risk	**1,350**	**62.0**	**514**
Data Quality			
Client & Counterparty	1,350	79.2	281
Market Data	1,350	52.9	636
Products & Instruments	1,350	68.2	429
Corporate Events	1,350	43.3	765
Control Totals	5,400	60.9	2,111
Data Quality	**1,350**	**60.9**	**528**
Business Systems (IT) Risk			
Integrated Trading System	1,350	78.9	285
Funds Transfer System	1,350	65.4	467
Global Nostros System	1,350	65.0	473
Global Ledger System	1,350	82.3	239
Funding & Liquidity System	1,350	69.4	413
Control Totals	6,750	72.2	1,877
Business Systems (IT) Risk	**1,350**	**72.2**	**375**
Control Totals	36,450	63.7	13,233
Total Processing Risks	**1,350**	**63.7**	**490**
Financial Risks			
Credit Risk Management	1,350	52.0	648
Market Risk Management	1,350	43.9	758
Liquidity Risk Management	600	55.0	270
Total Financial Risks	**3,300**	**49.2**	**1,676**
Total Product Risks	**4,650**	**53.4**	**2,166**

Sample Risk Accounting Report – Product Risk