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RENTD:

The heart of the Volcker Rule

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1. Introduction

Directly referenced only three times in the common text of the Volcker Rule, but peppered throughout the accompanying Supplemental Information over 250 times, the requirement to analyze and calculate reasonably expected near-term demand (RENTD) of clients, customers and counterparties (CCCs) is one of the most complex aspects of the final regulation implementing the Volcker Rule, which was published in December 2013.¹ Considerable attention and debate about RENTD has occurred in the two-plus years since the Volcker Rule became effective, culminating in a series of Volcker related recommendations in the US Treasury Department's recently issued report on regulations governing banks and credit unions.² Included within the report were recommendations specifically directed at the RENTD construct as an impediment to banks having sufficient flexibility to be effective market-makers with the knock-on effect of meaningfully lower levels of liquidity in the secondary capital markets.

Subsequent to the issuance of the Treasury's report, on August 2, 2017, the Office of the Comptroller of the Currency (OCC) issued a notice and request for comment³ on whether certain aspects of the regulation implementing the Volcker Rule should be revised to "better accomplish the purposes of the statute," while decreasing the compliance burden on banking entities and fostering economic growth. Among a variety of topic areas on which the OCC is seeking comment, questions posed included those seeking input on streamlining and simplifying existing exclusions and exemptions with specific questions on whether the concept of the Market Maker Inventory (MMI), and by extension the RENTD construct, was a helpful approach to determining if a trading desk's market-making activities were appropriate. Within the context of the current reexamination of the Volcker Rule and how it could be potentially modified, this paper provides thoughts on conceptual and operational challenges related to market-making RENTD and the related limits.

RENTD is directly referenced in the common text of the Volcker Rule in three specific places:

§_4(a)(2)(ii)—Underwriting Exemption: *"The amount and type of the securities in the trading desk's underwriting position are designed not to exceed the **reasonably expected near term demands of clients, customers, or counterparties**, and reasonable efforts are made to sell or otherwise reduce the underwriting position within a reasonable period, taking into account the liquidity, maturity, and depth of the market for the relevant type of security"*

§_4(a)(2)(iii)(B)—Underwriting Exemption: *"Limits for each trading desk, based on the nature and amount of the trading desk's underwriting activities, including the **reasonably expected near term demands of clients, customers, or counterparties**, on the: (1) Amount, types, and risk of its underwriting position; (2) Level of exposures to relevant risk factors arising from its underwriting position; and (3) Period of time a security may be held;"*

§_4(b)(2)(ii)—Market-Making Exemption: *"The amount, types, and risks of the financial instruments in the trading desk's market-maker inventory are designed not to exceed, on an ongoing basis, the **reasonably expected near term demands of clients, customers, or counterparties**, based on (A) The liquidity, maturity, and depth of the market for the relevant types of financial instrument(s); and (B) Demonstrable analysis of historical customer demand, current inventory of financial instruments, and market and other factors regarding the amount, types, and risks, of or associated with financial instruments in which the trading desk makes a market, including through block trades;"*

It is important to note that **§_4(b)(2)(iii)(C)** cites "factors prescribed by **(b)(2)(ii)**" in setting out the required RENTD limits and thereby incorporates the RENTD requirement by reference therein.

1. Throughout this document, reference to the "Volcker Rule" and "Final Implementing Regulations" means the cited portions of 12 CFR Parts 44, 248, and 351 and 17 CFR Part 255, "Prohibitions and Restrictions on Proprietary Trading and Certain Interests in, and Relationships With, Hedge Funds and Private Equity Funds; Final Rule".
2. US Department of the Treasury, "A Financial System That Creates Economic Opportunities: Banks and Credit Unions," Report to President Donald J. Trump, Executive Order 13722 on Core Principles for Regulating the United States Financial System, (June 12, 2017,) available at <https://www.treasury.gov/press-center/press-releases/Documents/A%20Financial%20System.pdf>.
3. Office of the Comptroller of the Currency, "Notice Seeking Public Input on the Volcker Rule," Notice; request for comment, (August 2, 2017), available at <https://www.occ.treas.gov/news-issuances/news-releases/2017/nr-occ-2017-89a.pdf>.

2. RENTD—The heart of the Volcker Rule

Proprietary trading⁴ as defined in the Volcker Rule is permitted only under specific exemptions, including market-making activities (“Section 4 exemptions”).⁵ In order to rely on the market-making exemption, a banking entity must meet a number of requirements, including: “*establishment and enforcement of a compliance program targeted to the activity; limits on positions, inventory and risk exposure addressing the requirement that activities be designed not to exceed the reasonably expected near term demands of clients, customers or counterparties; limits on the duration of holdings and positions; defined escalation procedures to change or exceed limits; analysis justifying established limits; internal controls and independent testing of compliance with limits; senior management accountability and limits on incentive compensation.*”⁶

The objective of the compliance program and, in particular the required limits, is to identify trading activity that may constitute impermissible proprietary trading and provide evidence that subsequent escalation, investigation, and resolution have occurred on a timely basis. Instances of impermissible proprietary trading must be reported to senior management and the appropriate regulatory agency or agencies. While the requirement seems clearly stated, establishing a compliance program that can differentiate between acceptable market-making activities and impermissible proprietary trading can be challenging. A key to achieving the required level of trading activity differentiation rests with a banking entity’s RENTD methodology and implementation of the related limits.⁷

Anchoring market-making activities to CCC demand is the core of the Volcker Rule’s compliance philosophy; the exemptions are intended to support these trading activities as long as they are being employed to provide liquidity and beneficial customer service to the capital markets. Trading activities beyond what is required to provide market-making services to CCCs and mitigate the resulting risk, would be deemed impermissible unless otherwise exempted or excluded. Given the linkage to CCC demand, RENTD is positioned within the context of the rule to be **the constraining factor** on the trading desk’s overall trading activity:

“A banking entity must have a reasonable basis for the limits it establishes for a trading desk and must have a robust procedure for analyzing, establishing, and monitoring limits, as well as appropriate escalation procedures. ...

*The limits established by a banking entity should generally reflect the amount and types of inventory and risk that a trading desk holds to meet the reasonably expected near term demands of clients, customers, or counterparties. As discussed above, while the trading desk’s market-maker inventory is directly limited by the reasonably expected near term demands of customers, **the positions managed by the trading desk outside of its market-maker inventory are similarly constrained by the near term demand requirement because they must be designed to manage the risks of the market-maker inventory in accordance with the desk’s risk management procedures. As a result, the trading desk’s risk management positions and aggregate financial exposure are also limited by the current and reasonably expected near term demands of customers.**”⁸*

Given the prominent role that RENTD plays in setting limits designed to detect potentially impermissible proprietary trading, having a robust and reasonable methodology for calculating RENTD and deriving the related limits is essential to achieving an effective compliance regime. The key question remains, however, as to how a banking entity or qualified independent party (“QIP”) would go about assessing whether a trading desk’s RENTD methodology and related limits are “reasonable and robust.”

Market-Making RENTD Related Limits

- 1. Market-Maker Inventory (MMI) Limit**—A limit on the amount, types and risks arising on the instruments for which the trading desk has met the criteria to be a market-maker.
- 2. Risk Management Inventory (RMI) Limit**—A limit on the amount, types and risks arising on the products, instruments and exposures the trading desk may use for risk management purposes.
- 3. Financial Exposure (FE) Limit**—A limit on the level of exposures to relevant risk factors arising from a trading desks aggregate risks across market-making, risk management and excluded instruments.⁹
- 4. Market-Making Holding Period (HPL) Limit**—A limit on the period of a time a financial instrument may be held by the trading desk.

4. The Volcker Rule defines proprietary trading as “engaging as principal for the trading account of the banking entity in any purchase or sale of one or more financial instruments”. Supra Note 1, 79 Fed. Reg. at 5781 [§ __.3 (a)].

5. There are a number of other exemptions provided in §_3, §_5 and §_6 of the Volcker Rule. The RENTD requirement relates to underwriting and market-making exemptions appearing in §_4.

6. Supra Note 1, 79 Fed. Reg. at 5542 [§III.B Proprietary Trading Restrictions].

7. As noted in the box on page 1, there are three specific underwriting limits and four specific market-making limits related to RENTD. The terms “RENTD related limits” generally refers to them collectively. Please refer to the common text of the Volcker Rule, §_4(a)(2)(iii)(B) and §_4(b)(2)(iii)(C) for the language specifying the required limits [79 Fed. Reg. at 5783-5784].

8. Supra Note 1, 79 Fed. Reg. at 5616 [Subpart B, §_4(b)(c)(3)(c)].

9. Excluded instruments (e.g., repos, loans, spot FX, spot commodities) can be included within FE at the discretion of the trading desk.

3. Compliance with the RENTD requirement— What does it look like?

3.1 Documented methodology

The methodology and rationale that a particular trading desk utilizes to analyze CCC demand and set the required limits needs to be clearly stated and available for review. The required information can appear in a stand-alone document or be combined with other Volcker Rule compliance program materials. The requirement for documentation is explicitly stated in the Subpart D compliance program written policies and procedures requirement, and reinforced by the stated expectation that the demonstrable analysis supporting RENTD and the related limits be reviewable.¹⁰

3.2 Demonstrable analysis

The Volcker Rule defines this standard to mean that the analysis “must be based on factors that can be demonstrated in a way that makes the analysis “reviewable.” These factors can include historical trading activity and market information that is “readily available and retrievable.”¹¹ Within this broader context, the Volcker Rule specifies factors that may be considered within the demonstrable analysis, but stipulates that

the resulting output must be documented in a form that makes it possible to test. These requirements foreshadow a detailed review within the context of regulatory examination, and highlight the importance of documenting all the factors and assumptions considered within the RENTD analysis and limit setting process. Further discussion regarding specific methodological considerations of the demonstrable analysis requirement are presented below.

3.3 Trading desk level reporting

RENTD related limits for market-making desks represent “hard” limits that require a priori analysis, escalation and independent review to justify temporary or permanent changes. Moreover, in the case of inadvertent breaches resulting from changing market conditions, trading desks are required to establish an action plan to bring exposures back under limits as soon as practicable. To determine whether trading desks are complying with these limits, exposures against and utilization of MMI, RMI and FE limits should be reported and reviewed regularly. In addition to the

hard limit levels, it is common to employ “trigger” levels set at a somewhat lower level to serve as a warning when limit utilization is reaching a level that could lead to an inadvertent breach.

Based on our experience, most trading desk-level reporting for RENTD related limits is anchored around end of day (“EOD”) exposures and attendant reporting processes in much the same manner as other risk metrics. This is a pragmatic approach to the rule’s requirements as these daily routines are very well established in most trading businesses. It is important to note, however, that there is a reference in the text of the implementing regulations where monitoring of intraday exposures and activities are mentioned.¹² The exact circumstances under which this intraday standard would apply and whether it should be interpreted as an EOD review of intraday trading activity, or would actually require true real-time monitoring is one aspect of compliance with the market-making exemption of the Volcker Rule that remains to be clarified.



10. Supra Note 1, 79 Fed. Reg. at 5605 [Subpart B, §_4(b)(c)(2)(c)].

11. *ibid.*

12. Supra Note 1, 79 Fed. Reg. at 5594 [Subpart B, §_4(b)(c)(1)(c)(ii)].

3. Compliance with the RENTD requirement— What does it look like? (cont.)

3.4 Management level reporting

Aggregated reporting of the RENTD related limits and utilization provides management with information essential to meet supervisory responsibilities. The frequency and level of granularity of this reporting can vary, but trading desk level granularity reported on a monthly basis represents the minimum standard at which most banking entities should aim. Information presented can include daily trading desk level exposures during the reporting period, limit utilization statistics, minimum and maximum utilization and breaches that occurred, the underlying circumstances, and the resolution reached.

For many organizations, reporting information on Volcker compliance has been integrated with existing risk reporting, which is typically reviewed at one or more Volcker and/or risk management committee meetings. This approach makes sense given the interdependence of RENTD and the underlying risks being managed by the trading businesses. Inclusion of Volcker-related monitoring results within risk committee reporting also serves the purposes of informing senior management regarding compliance issues and enabling documentation of effective escalation and resolution.

3.5 Escalation and oversight

Escalation procedures is a term used throughout the Volcker Rule to emphasize the need to monitor for compliance along several dimensions and to proactively identify and raise potential issues that may constitute impermissible proprietary trading. These escalation procedures can be generally classified into three categories as shown in the table below.

With regard to Limits and Thresholds and Policies and Mandates, procedures need to be defined as they relate to formally managing proposed changes as well as the steps required to investigate breaches or exceptions once they have occurred. The final category, Compliance Violations, covers instances where an initial review of breaches or exceptions has concluded that the facts and circumstances suggest a reasonable likelihood that impermissible proprietary trading has occurred.

Table 1: Escalation and oversight summary

	Changes	Breaches/Exceptions
Limits and thresholds	Applicable to changes to limits and thresholds related to specific measures and metrics that are set forth within the body of the Volcker Rule and Appendix A. The rule differentiates between temporary and permanent changes to limits or thresholds, but in practice, both require similar escalation procedures.	The monitoring and reporting implemented to meet the requirements of the Volcker Rule are a core component of the compliance program and critical to each trading desk's compliance with its required limits and thresholds. Breaches of limits and thresholds should be investigated and escalated if management concludes that the breaches "suggest a reasonable likelihood" ¹³ that impermissible proprietary trading has occurred.
Policies and mandates	Written policies and procedures are required to be in place that clearly describe the specific authorized activities and related controls that evidence compliance. The written policy and procedures can be organized in various ways and layers of granularity, but there should typically be higher level governing policies and trading desk level mandates/procedures that specify how the higher-level requirements are met. Once the compliance program is active, changing these documents, particularly at trading desk level, requires formal escalation, review and approval.	Similar to limit or threshold breaches, identifying exceptions to policy and determining if these represent violations that indicate a reasonable likelihood that impermissible proprietary trading has occurred is central to compliance monitoring.
Compliance violations	When quantitative measurements or other information—considered together with the facts and circumstances or findings of internal audit, independent testing, or other review — suggest a reasonable likelihood that non-compliance with the Volcker Rule has occurred, a banking entity is required to formally escalate its findings to senior management supervising the trading desk and other senior management, notify the relevant regulatory agency(ies), implement appropriate remedial action (e.g., divesting of impermissible positions, cessation of impermissible activity, disciplinary actions), and document the investigation findings and remedial action taken. ¹⁴	

13. Supra Note 1, 79 Fed. Reg. at 5801 [Appendix B §II.5.iv].

14. Supra Note 1, 79 Fed. Reg. at 5801 [Appendix B §II.5.iv].

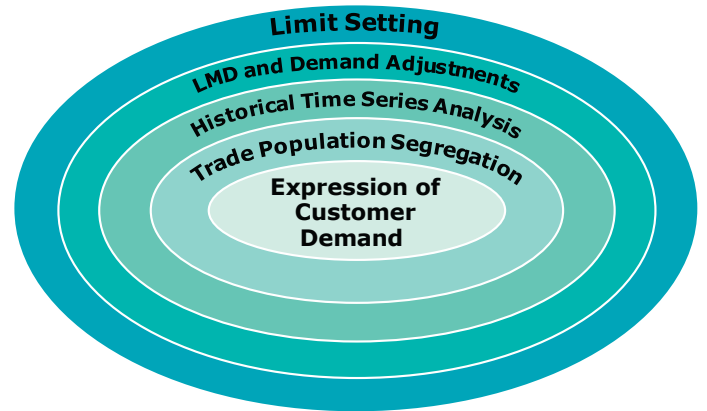
4. Demonstrable analysis deep dive

Of the RENTD Compliance Program components discussed in Section 3, developing a sound RENTD analysis and limit setting methodology and using it to produce “demonstrable analysis” is a fundamental element. Effective RENTD demonstrable analysis should be both conceptually sound and operationally feasible. This is particularly true if the analysis will be repeated often in order to assess proposed transactions against limits or to assess the limits themselves within the context of the methodology. This section takes a deeper look at the demonstrable analysis of RENTD within the context of the market-making exemption.

4.1 Conceptual framework

A banking entity’s approach to calculating RENTD and translating it into the required limits consists of a number of interrelated concepts that should be addressed within the context of the trading desk’s specific mandate, the nature of the financial instruments transacted, and the liquidity, maturity and depth of the markets in which the trading desk operates. We refer to this conceptual framework as the RENTD Bullseye and Figure 1 depicts the different elements of demonstrable analysis and the layered and sequential nature of each. Table 2 on the next page describes the Bullseye elements in more detail.

Figure 1: Demonstrable analysis bullseye



Starting with a trading desk’s selected expression of CCC demand, demonstrable analysis builds through trade population segmentation and other components to support the analysis and setting of limits. This “center-out” sequencing leads to limits that have both logical consistency and evidentiary support.



4. Demonstrable analysis deep dive (cont.)

Table 2: Demonstrable analysis bullseye elements

Element	Definition	High-level considerations
Expression of CCC demand	Refers to the specific measurement (e.g., notional, risk factor sensitivity, trade volumes, VaR, etc.) used to define CCC demand.	Demand within this context is expressed with reference to the market-making inventory held, which can vary based on the type of MMI financial instruments (e.g., securities versus derivatives) and the nature of the analysis performed (e.g., transaction volume/flow versus EOD measures).
Trade population segregation	The process of bucketing historical trades or exposures into MMI-CCC and MMI, RMI and Excluded Instruments (EI – if included in FE) for the purposes of enabling RENTD demonstrable analysis.	To calculate RENTD and establish the required limits, the historical data needs to be correctly classified to enable the bottom-up calculations. Depending on a banking entity's expression of CCC demand and methodology employed, significant effort may be required to retrofit these classifications onto the historical dataset.
Historical time series analysis	Historical time series analysis represents the unadjusted historical CCC demand. It is a function of the specific analytical technique applied to the selected expression of CCC demand.	A trading desk's historical time series represents the starting point for RENTD analysis and can be adjusted upward or downward based on LMD and Demand Adjustment Factors. It is critical to note that historical time series can vary widely depending on the specific expression of CCC demand selected and the analytical techniques applied to generate the time series.
LMD impact	Liquidity, maturity and depth (LMD) represent features of the markets in which market-making financial instruments trade. The Volcker Rule allows for variation in RENTD and limits across asset classes due to differences in LMD.	LMD can impact the RENTD conceptual framework in various ways depending on how CCC demand is expressed. In many ways, the historical time series can reflect LMD for a particular trading desk, but additional adjustments can be made for illiquid asset classes and to incorporate hedging relationships between MMI and RMI.
Demand adjustment factors	Demand adjustment factors represent other, non-LMD, adjustments to the baseline demand analysis and are typically included to address issues related to expected business growth.	While these types of adjustments are commonly made, the rationale and relationship to the RENTD related limits is often poorly defined. This is particularly true of assumptions related to business growth, which need to be formally analyzed and justified.
Limit setting process	Limits are required for MMI, RMI, overall FE and the length of time an instrument can be held (holding period) for each trading desk. These limits should "account for and generally be consistent with" the historical demands of CCCs and the inventory held to service that demand.	The process of limit setting should be "bottom-up" and start with the historical time series derived from the CCC transactions/exposures within MMI. This demand profile is then overlaid onto the MMI portfolio to set the MMI limit. RMI and FE limits are then set in reference to the MMI limit so determined.

4. Demonstrable analysis deep dive (cont.)

4.2 Operational considerations

Each element of the RENTD conceptual framework plays an important role in meeting the demonstrable analysis standard. In our experience, different approaches and methods are possible for several of the elements, but the trade-offs of each approach should be noted and managed. In this section, we explore demonstrable analysis in more depth.

4.2.1 Expression of CCC demand

Fundamental to effective RENTD demonstrable analysis is the need to decide how CCC demand will be defined. There are choices available ranging from value-based measures such as balance sheet carrying value or notional values to risk-based measures constructed on risk factor sensitivities. We have noted instances of portfolio-level risk measures (e.g., VaR) being used, but the language of the Volcker Rule appears to emphasize an overall orientation toward financial instruments and related risk exposures at a more granular level.

For the most part, practices common across the industry appear to favor value-based risk exposures for securities-only trading desks with risk-based measures more frequently used for derivative oriented trading desks or those trading desks with a combination of securities and derivatives. Setting these general tendencies aside, system and data constraints can have a significant impact in determining what is a feasible expression of CCC demand for a particular trading desk. This is particularly true for derivative trading desks where risk-based approaches are more common and the netting and risk calculation methods have historically not been configured to support the production of risk factor sensitivities at the more granular level required by the Volcker Rule.

Based on our experience and the current regulatory guidance, there is no consensus

regarding the “right” expression of CCC demand. The approaches can be grouped into three broad categories, each with advantages and disadvantages as shown in Table 3 below. When reflecting on the different potential approaches, Notional/Market Value and Risk Factor-Based approaches appear to be most consistent with the spirit and intent expressed in the Volcker Rule and accompanying Preamble.

Table 3: Conceptual Approaches to Expressing Customer Demand

Expression of CCC demand	Advantages	Disadvantages
Transaction Volume (e.g., Gross Notional or Market Value of Trades)	<ul style="list-style-type: none"> (1) Intuitively consistent with the concept of “demand” (i.e., represents actual trades executed) (2) Typically easier to source and work with historical transaction data versus risk measures that are often calculated using a book hierarchy that is not aligned with Volcker sub-portfolios 	<ul style="list-style-type: none"> (1) Requires monitoring of intraday trading activities so that the measure being compared to the flow-based limit is itself flow based (i.e., applies to apples principle) (2) Does not account for existing positions within the context of CCC demand—a specific requirement of the Volcker Rule (3) Not typically consistent with how a desk manages its risk (i.e., the net risk position is typically utilized, not trading volumes)
EOD notional or carrying value	<ul style="list-style-type: none"> (1) Instrument-based and aligned with the primary orientation of the Volcker Rule (2) Typically easier to source notional or carrying value and perform required portfolio segmentation than with risk factor or portfolio risk based approaches (3) Consistent with how securities and simpler derivatives trading desks typically manage risk—may be easier to align limits across MMI, RMI and FE 	<ul style="list-style-type: none"> (1) May need to “risk-weight” exposures across time buckets—not difficult, but can be tedious (2) Notional values in some organizations suffer from data quality issues due to historical lack of emphasis on this particular data attribute (3) For exotic or structured derivative trading desks, notional-based approaches are typically not consistent with how risk is measured and managed
EOD Risk Factor Based (e.g., Delta, CS01, DV01)	<ul style="list-style-type: none"> (1) Consistent with how many trading desks – both securities and derivatives – currently manage the risk arising from their market-making activities (2) Aligning limits across MMI, RMI and FE is typically easier as FE limits usually already exist 	<ul style="list-style-type: none"> (1) Technically the most challenging approach to collect historical data (i.e., recalculating RFS on each RENTD transaction portfolio for each day in the historical window may be required or an approximation developed) (2) Risk bucketing between market risk measurement framework (e.g., VaR) and RFS RENTD buckets may be needed (3) Selecting all “significant market factors” to be analyzed for RENTD requires judgment and it may not be operationally feasible to perform demonstrable analysis on all identified as such

15. Supra Note 1, 79 Fed. Reg. at 5605 [Subpart B, §_4(b)(c)(2)(c)].

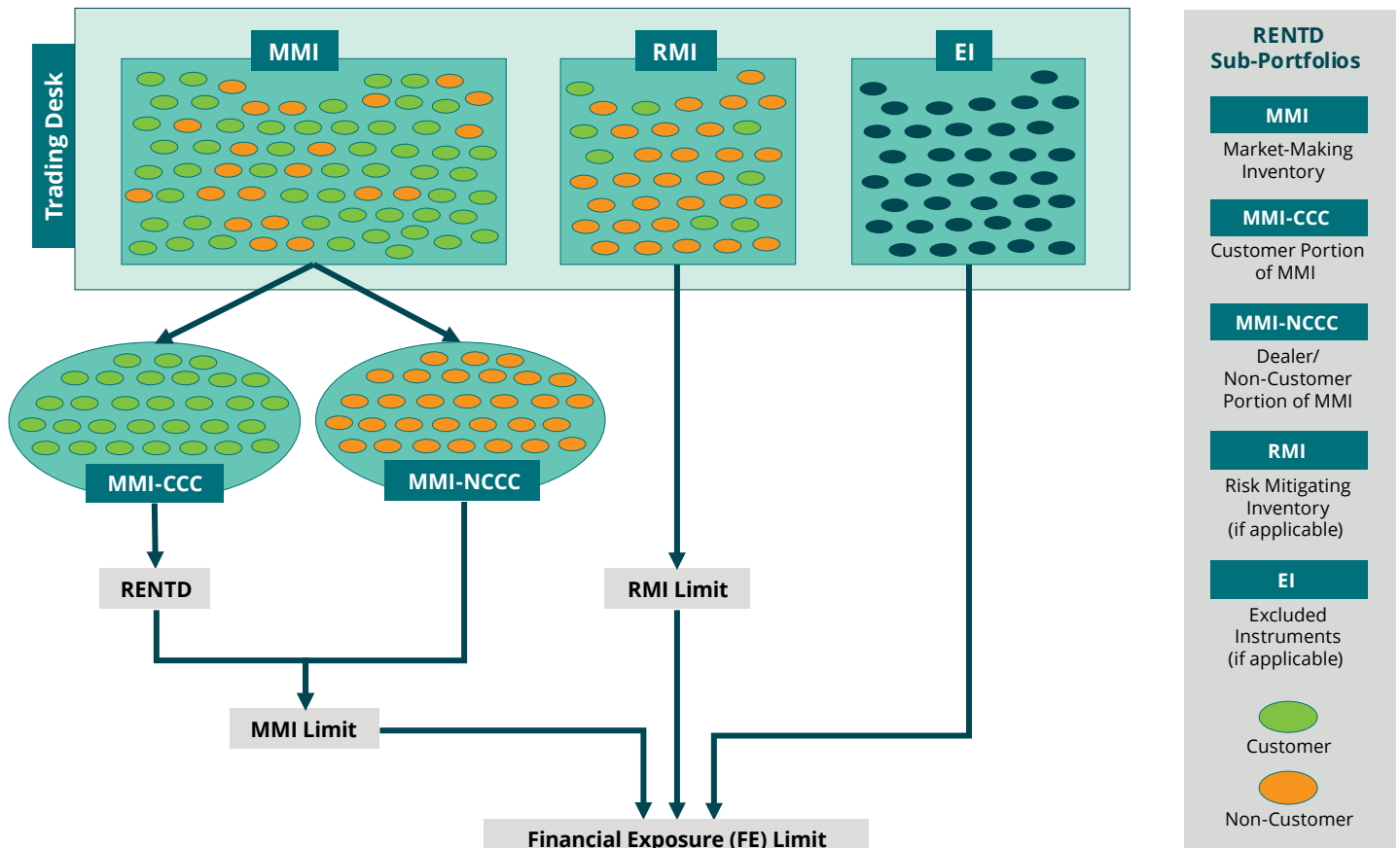
4. Demonstrable analysis deep dive (cont.)

Of critical importance in evaluating expressions of CCC demand is the decision regarding use of intraday trading volumes versus EOD risk exposures. The MMI construct is by definition an “inventory” measure and thus points toward an EOD risk measurement as representing the risk capacity required to service CCC demand. Using EOD risk measures as the basis for evaluating CCC demand can be helpful because they reflect the natural offsets that occur with CCCs if a market-making trading desk can trade on both sides of the market throughout the trading day. A gross measurement that sums absolute values of trading on both sides throughout the trading day may likely not reflect the liquidity, maturity and depth of the financial instruments for which the trading desk makes a market.

4.2.2 Trade population segmentation

Assigning trades to the RENTD categories of MMI, RMI and Excluded Instruments (EI) as well as assigning CCC and Non-CCC (NCCC) designations requires implementation of new trade booking attributes in many organizations. These new data attributes are critical to enabling demonstrable analysis through the bucketing of transactions and financial instruments into sub-portfolios upon which RENTD and limit analysis can be performed. The figure below depicts how this trade population segmentation drives the calculation of RENTD and the setting of related limits.

Figure 2: RENTD related trade population segmentation



4. Demonstrable analysis deep dive (cont.)

While segmentation in this manner may not be particularly complex from a conceptual point of view, it can be burdensome because most trading desks do not view their risk in the manner specified in the Volcker Rule. More specifically, many risk metrics are already calculated and limits set at the FE level. The sub-portfolios for MMI-CCC, MMI-NCCC, MMI, RMI, and EI need to be enabled by the addition of transaction level attributes and will probably have to be added to transaction capture processes or derived from existing attributes (e.g., product-level mapping to MMI). These sub-portfolio views are needed in order to provide the aggregation and calculation of exposures or values that support RENTD analysis and limit setting. Until these attributes are captured at the transaction level and flow through to the EOD risk exposures, the retro-fitting of these new attributes is no small task in our experience, and tactical solutions used to accomplish this task can introduce operational risk into the analysis and substantially increase the likelihood of data quality issues.

Another point of emphasis with regard to trade population segmentation is determining whether financial instruments that are classified within MMI meet the specific criteria (“market-making indicia”) defined in the Volcker Rule.¹⁶ Many firms utilize some form of a product taxonomy that groups individual financial instruments into broader categories sharing common features such as interest rate swaps, investment grade corporate bonds or equity ETDs. Documenting the specific rationale and evidence used to justify a particular financial instrument as market-making is often an afterthought. However, it is important to be thorough in the designation and classification so that a trading desk can demonstrate it routinely stands ready to purchase and sell one or more types of financial instruments and is available to quote, purchase, and sell those types of financial instruments on both sides of the market on a continuous basis throughout market cycles. In some instances, we have seen firms simply declare that a specific trading desk is a market-maker in

a particular financial instrument or asset class simply because they have historically transacted in those markets. A more deliberate approach is needed that clearly sets out the basis to qualify a particular instrument or product within MMI.

In terms of tagging of CCCs and NCCCs, many financial firms have adopted a centralized operating model when it comes to managing counterparty static reference information. In this model, a dedicated team manages the counterparty data repository that enables a single “golden source” with regard to counterparty names, parent-child hierarchies and other static reference data used by applications across the enterprise to capture contractual arrangements with third parties. In many instances, these centralized counterparty data management capabilities can be leveraged to assign CCC and NCCC default tagging values.

While the default tagging tends to align with the “Big 9” being classified as NCCC and all else CCC, trading desks will often document



16. Supra Note 1, 79 Fed. Reg. at 5589-5590 [Subpart B, §_4(b)(2)(i)] of the Volcker Rule provides that the trading desk that establishes and manages the financial exposure must routinely stand ready to purchase and sell one or more types of financial instruments related to its financial exposure and be willing and available to quote, buy and sell, or otherwise enter into long and short positions in those types of financial instruments for its own account, in commercially reasonable amounts and throughout market cycles, on a basis appropriate for the liquidity, maturity, and depth of the market for the relevant types of financial instruments.

4. Demonstrable analysis deep dive (cont.)

exceptions for affiliates of these firms—particularly for asset management related legal entities that function more as buy side than sell side firms. The tagging process employed by an organization should be capable of applying these exceptions for specific trading desks to the data. Whether exception tagging is managed offline from the centralized repository or embedded within the core counterparty data team's responsibilities, the key point is that the process takes into account the correct CCC/NCCC tagging in segregating the trade population.

4.2.3 Historical time series analysis

Having defined how RENTD will be expressed in terms of CCC demand and applied portfolio segmentation to trades or risk exposures, historical demand can be calculated through time series analysis for the look-back window being used in the demonstrable analysis. With a fully segregated trade population, it is possible to derive historical time series of the CCC demand within each sub-portfolio (MMI-CCC, MMI-NCCC, MMI, RMI, EI and FE as applicable). As

denoted in the figure above, the historical time series for MMI-CCC represents CCC demand and provides the starting point for defining RENTD and the related limits.

While the size of historical windows varies, 12 months is the most common window and many firms are updating their analysis within the year (e.g., quarterly) to enable quicker evaluation of the limits and to make adjustments as needed. While longer is generally better, there may be constraints that may limit a particular trading desk's ability to generate the historical information. This is particularly true in instances where risk factor sensitivities expressions of CCC demand are used because of the need to recalculate historical values for MMI-CCC, MMI, RMI and EI sub-portfolios. Shifts in market conditions or the trading desks business model could also impact a desk's decision on what historical look back window is appropriate.

We have noted instances where CCC demand is being more broadly defined to include request for quotes (RFQs) where the trading desk participated in quoting, but was

not awarded the trade, as well as general inquiries regarding where the trading desk is making a market. While inclusion of these types of indicators may be conceptually consistent with the RENTD requirements, in practice we have noted data quality issues with the historic capture of this information, which can impact the quality of the demonstrable analysis supporting RENTD calculations and related limits. In addition, as trading desks move from executed trades to RFQs to more general indications of demand, the ability to clearly articulate the rationale of CCC demand becomes impeded as many of the measures used for RENTD such as risk factor sensitivities and VaR are not calculated on trades that are not consummated. Sourcing this information and determining if it is of consistent quality with those measures related to executed trades is no small undertaking. A final consideration is the ability to separate the impact of demand adjustment factors such as business growth assumptions, which may be based on accumulating greater market share on missed trades.



4. Demonstrable analysis deep dive (cont.)

Once each of the sub-portfolios have their historical time series created, they can be used within the context of RENTD analysis and limit setting. MMI-CCC provides the basis for the historical analysis used in calculating RENTD, which then informs the setting of MMI, RMI, FE and Holding Period limits. While development of the time series itself is relatively straightforward once the historical data is suitably enriched, there is often an interest in seeing different iterations or scenarios using assumptions or attributes. Consequently, demonstrable analysis would ideally be performed using an analytical platform that provides the capability to compute and visualize each of these historical time series under various risk bucketing approaches. Due to the lack of experience viewing the transactions and risks in the manner that the Volcker Rule requires, multiple iterations across the sub-portfolios are likely needed to settle on the final risk bucketing and limit levels—having the capability to rapidly re-compute and visualize alternative scenarios can improve the quality of and reduce the time necessary to perform demonstrable analysis.

Introduction of portfolio segmentation that is consistent with the Volcker Rule can have interesting impacts on the portrayal of historical CCC demand. Separating CCC from NCCC trades within MMI can introduce a trend to the historical time series for market-making trading desks where these trades are often executed back-to-back for hedging purposes. This may be more common for securities based market-making desks, which tend to offset CCC trades with NCCC trades. The shape of the baseline demand profiles impacts the statistical approaches that are used to analysis RENTD and set limits as discussed further below.

4.2.4 LMD impact

Liquidity, maturity and depth are key terms used throughout the Volcker Rule to provide a basis for asset class specific approaches to RENTD analysis and limit setting. LMD factors were emphasized in the Volcker Rule to address concerns expressed by commenters that the proposed rule did not allow for enough flexibility and assumed a “one-size-fits-all” approach. As a practical matter, LMD factors may be reflected in the historical demand profile developed from historical data for each sub-portfolio, and further adjustments would need to be thoughtfully argued. Having said this, there are instances where LMD factors can impact the setting of RENTD required limits in both upward and downward directions. It is important to clearly document how LMD factors are identified, computed and applied within the RENTD analysis and limit setting process.

For market-making desks trading highly-liquid financial instruments, two-way trading flow can result in off-setting MMI-CCC and MMI-NCCC trades, which could lead to net EOD risk flat position for MMI despite significant intraday trading volume with CCCs.¹⁷ If trading volumes are significant enough, even the MMI-CCC baseline demand profile may be closer to net risk flat due to trading on both sides with CCCs. In these instances, the variability of CCC demand might indicate higher limits are reasonable (discussed further below), but downward adjustments might be appropriate due to LMD considerations that enable rapid offsetting of exposures with NCCCs intraday and very little net risk carried through to the EOD exposures.



17. This of course assumes a trading desk is using EOD net risk exposures as the expression of customer demand

4. Demonstrable analysis deep dive (cont.)



On the other end of the spectrum, for trading desks that make generally one way markets and/or are trading in highly illiquid instruments, the ability to offset risks arising from CCC trading activities with NCCCs may be limited, which makes the desk reliant on RMI related hedging to manage the risk arising from its market-making activities. In these situations, an LMD adjustment for hedging effectiveness needs to be considered because the volatility inherent in the MMI time series may imply higher FE limits without factoring RMI exposures into the analysis. In these cases, the LMD hedging effectiveness adjustment enables reconciliation of MMI, RMI and FE limits. The LMD adjustment is used in this context to incorporate the historical effectiveness of hedging instruments into the RENTD analysis and limit setting process.

4.2.5 Demand adjustment factors

Similar to LMD factors, Demand Adjustment Factors (DAFs) reflect other specific modifications to the historical demand profile that a trading desk wishes to make in the setting of its required limits. The two most common adjustments include seasonality and assumptions regarding future business growth. As with all aspects of the RENTD methodology, assumptions regarding these types of adjustments should be clearly documented and justified through quantitative analysis whenever possible.

Similar to the discussion above with regard to LMDs, seasonality can often be seen in the baseline demand profiles for each sub-portfolio on the trading desk. Consequently, incorporating these adjustments into the analysis may not be required if seasonality

is already reflected in the unadjusted historical trade data. Further seasonality adjustments beyond what the historical data indicates is already present would accordingly need to be thoughtfully argued.

Perhaps the area where more qualitative approaches predominate is adjustments for future business growth. Financial institutions making these types of adjustments often have documented business plans with future revenue targets that substantiate the desired level of business growth. What is frequently missing, however, is a clear articulation of how these growth imperatives are translated into specific and justifiable adjustments in the limit setting process. Relatively simplistic projections of percentage growth onto baseline demand are common, but more sophisticated and rigorous approaches are likely warranted. Such analysis should address:

- The amount of expected business growth as there should be sound reasoning as to why the business is expected to grow
- The relationship between business growth and the limit increase as it does not necessarily follow that this relationship is direct and/or linear

For example, limit setting processes in most firms do not translate increases in revenue growth (e.g., 10% YoY growth) into the same increase in VaR limits. It should therefore be possible to apply a similar level of rigor to analyzing the impact of business growth assumptions on the RENTD related limits. Limit utilization should also be closely monitored when using DAFs to determine if the expected conditions did indeed materialize. If project growth does not occur as planned, the limits should be reassessed and recalibrated as appropriate.

4. Demonstrable analysis deep dive (cont.)

4.2.7 MMI limit setting process

Setting the required market-making limits represents the culmination of the RENTD analysis and makes use of all of the preceding elements. The analysis is anchored in the historical time series that have been created using trading activity and EOD exposures for each RENTD related measure that will be used. For example, if RENTD related limits are being set on a rates derivative trading desk's EOD Interest Rate (IR) Delta exposure, then the MMI-CCC, MMI, RMI and FE historical EOD IR Delta time series driven by trading activity within each sub-portfolio would all be used to evaluate the variability of CCC demand, the effectiveness of hedging activity and the levels of risk that needed to be carried in inventory. These historical time series and their associated descriptive statistics can be used to model various demand scenarios in order to understand the impact of assumptions related to LMD and DAFs so that limit levels can be evaluated and agreed.

Within this context, CCC demand is represented by the transactions executed with CCCs throughout the historical look-back window, but limits are set on the MMI residual risk that is carried overnight because of these trades. Continuing with our IR Delta example, RENTD, can be defined using the EOD IR Delta MMI-CCC time series as it represents the risk exposures at EOD carried overnight as inventory related to CCC demand for the instruments in which the trading desk makes a market. Implicit in these EOD inventory levels is the natural trading flow the desk experiences during the trading day with its CCCs. The deeper and more liquid the market, the more likely the trading desk experiences two-way flow with CCCs and correspondingly, net EOD MMI-CCC IR Delta risk would be expected to be lower. In contrast, in less liquid and illiquid financial instruments characterized by more CCC demand on one side of the market, the net EOD MMI-CCC time series would exhibit generally higher levels of net risk due to the lack of off-setting trades throughout the trading day.

Of particular importance in evaluating overnight inventory limits for MMI is the variability of CCC demand. To the extent that the MMI-CCC time series exhibits greater variability during the historical analysis time window due to greater variations in CCC demand and/or lack of liquidity, then the need to carry higher risk inventory to service that demand is more likely to be justified. In contrast, if there is little variability in the EOD MMI-CCC time series and the trading desk faces deep liquid markets, then the expectation for overnight inventory levels would be lower. To provide an analytical framework through which RENTD can be used to set limits, descriptive statistics can be calculated on the MMI-CCC time series including the mean and standard deviation ("SD") or root mean squared error ("RMSE").¹⁸ These statistics can serve to characterize the variability in historical CCC demand, which serves as a basis to justify inventory capacity needed to accommodate this level of uncertainty.



18. Implicit in this approach is the assumption that the daily values used in each time series create a normal distribution when considered through a bucketed histogram. If significant skew in the distribution of daily values is present, lognormal adjustments may be required.

4. Demonstrable analysis deep dive (cont.)

One of the most interesting twists in the RENTD-related compliance regime is that it requires the setting of MMI portfolio limits based on the analysis of historic CCC demand for the products in which the trading desk makes markets. CCC demand often represents only a portion of what is actually contained within MMI, so the portfolio limit needs to reflect both CCC and NCCC transactions and risk exposures, which tend to offset each other. These requirements can be reconciled by overlaying the variability of CCC demand (i.e., the SD or RMSE of the MMI-CCC time series) onto the historical MMI time series (which nets both CCC and NCCC trading activity). This approach has the virtue of balancing the need to link MMI limits to CCC demand while taking into account the naturally occurring risk offsets arising from NCCC trading activity used for price discovery and/or hedging purposes.

4.2.8 RMI limit setting process

RMI limits represent another complicated aspect of implementing RENTD related limits. The challenge arises because RMI activities are expected to be risk reducing and anchored on MMI exposures, which will vary over time.

To rely on the market-making exemption, RMI financial instrument hedging activities must demonstrably reduce or otherwise mitigate risks arising from a trading desk's market-making activities. More specifically, a trading desk will need to be able to demonstrate that its purchases and sales of RMI financial instruments used to hedge its market-making activities are: (1) in connection with risks arising from that market-making business, and (2) reduce or otherwise significantly mitigate those risks in a prompt manner. In addition, the Volcker Rule specifies that the trading

desk's risk management program must be "designed to prevent a trading desk from over-hedging its market-maker inventory or financial exposure," because "over-hedging results in a new risk exposure that is unrelated to market-making activities and, thus, is not permitted under the Market-Making Exemption."¹⁹

Accordingly, RMI limits need to be defined in relationship to MMI exposures. The relationship can be defined as an EOD MMI-RMI Ratio of the amount of risk held in MMI versus the risk arising from RMI financial instruments. Minimum and maximum limits of the MMI-RMI Ratio can be established using this approach, and monitored on a daily basis and complemented by periodic correlation analysis (e.g., quarterly).



19. Supra Note 1, 79 Fed Reg. at 5614-5615 [Subpart B, §_4(b)(c)(3)(c)]

4. Demonstrable analysis deep dive (cont.)

The logic of the maximum RMI limit is that hedging exposures arising from financial instruments within RMI are not expected to exceed MMI in the opposite direction beyond some small slippage factor. In contrast to the maximum RMI limit, the minimum RMI limit serves to demonstrate that RMI financial instrument hedging activities demonstrably reduce or otherwise significantly mitigate promptly risks arising from a trading desks market-making desk's activities. The RMI-MMI Ratio can be calculated as the RMI exposure divided by the MMI exposure level for each trading day in the historical analysis window. When MMI exposure levels are below the MMI limit, the expectation is that RMI levels will fall within the minimum and maximum range of MMI levels.

While both of these measures can provide some degree of confirmation that a trading desk is not engaging in impermissible proprietary trading, care should be taken in the interpretation of results, particularly when exposures are close to zero as the ratios can expand substantially and create false positives. To address this issue, thresholds can be introduced below which the ratio levels are calculated but flagged to alert the reader of the report that the result was impacted by low risk levels.

A natural question to ask is why the FE Limit alone cannot effectively serve to mitigate the risk of over hedging. Because FE serves as a net risk limit, substantial leeway could be present for the trading desk to over hedge transactions without breaching FE limits.²⁰ The cost of hedging does allay this risk somewhat, but in deep liquid markets where hedging is relatively inexpensive, this type of trading could be undertaken.

In addition to RMI limits and monitoring, periodic correlation analysis on RMI and MMI trading activity and EOD exposures can be undertaken in order to assess the effectiveness of hedging activities and evaluate whether Maximum EOD and MMI-RMI Ratio limits should be adjusted. Correlations can be calculated as the relationship between both EOD and Trading Activity MMI, RMI and FE time series and can be based on exposure levels or the change in exposures. The expected correlation levels vary by trading desk and need to be evaluated using the historical time series data. In general, however, MMI-RMI correlation is expected to be negative and in a range representative of historical experience as demonstrative of effective hedging relationships.²¹ In cases where a correlation does not fully demonstrate hedge effectiveness, other logic and rationale should be documented to support the RMI limits.

4.2.9 FE limit setting

FE represents the sum of risk exposures arising from all trading activities on the desk (i.e., MMI plus RMI and any excluded instruments such as loans, spot FX or repos) and is typically the level at which most risk limits have been historically set and monitored. FE limits are set on many different types of risk exposures and factors, only a subset of which may have MMI and RMI limits. For risk factors that are deemed RENTD related, the FE limits should be set using units of measure (e.g., EOD risk exposures) that are consistent with the those used for setting MMI and RMI limits on the same risk factor.²²



20. Consider, for example, the scenario where a corporate bond trading desk has an FE IR Delta limit of \$5m. If the IR Delta MMI Limit is set to \$8m, conceptually the trading desk could hedge up to \$12.99m and still be within FE Limits. The resulting position would be in the opposite direction from that generated from MMI activities and could be viewed as over hedging.

21. Hedging effectiveness can vary meaningfully across trading desks with different asset classes due to liquidity, maturity and depth of the markets within which the financial instruments trade. Accordingly, a banking entity should undertake analysis to determine a reasonably expected hedging correlation based on historical data and an assessment of the inherent characteristics of the financial instruments the trading desk makes a market in and the available hedging instruments.

22. For example, on a Structured Rates Derivatives Trading Desk, Rates and FX Delta and Vega might be selected as risk factors upon which MMI, RMI and FE limits will be set. The method of computing these exposures should be the same at each limit level. In practice, we have noted instances where this was not always the case.

4. Demonstrable analysis deep dive (cont.)



An important point to consider about FE limits is that they are often where a financial institution's risk appetite and RENTD-derived limits will need to be reconciled. In some cases, the variability of CCC demand might suggest higher limit levels than risk appetite would permit. Unless management wishes to alter its risk appetite, then in these cases, risk appetite-based limit levels would continue to apply. In contrast, when CCC demand variability suggests limit levels that are lower than management's risk appetite, a harder conversation about the necessity of reducing limits to align them with CCC demand may be required. It is in these latter cases where risk appetite exceeds CCC demand that RENTD becomes a truly constraining factor on a trading desk's market-making activities.

As noted above in Section 2, the fundamental philosophy of the Volcker Rule is centered on a "bottom-up" limit setting process that is driven by CCC demand and not "top-down" driven by risk appetite. Accordingly, the analytical procedures used to analyze CCC demand, the effectiveness of market-making hedging, and MMI and RMI limits should all inform where FE limits are set. The dynamic that plays out in this analysis will again likely be influenced by the nature of the financial instruments in which the trading desk makes a market. The liquidity, maturity and depth of the markets in which the financial instruments trade will affect the ability of the trading desk to trade on both sides of the market within MMI and readily hedge the residual risk arising from market-making activities.

4.2.10 MMI Holding Period Limits

The final RENTD related limit for market-making trading desks is the Holding Period Limit, which represents the amount of time a trading desk is permitted to hold

financial instruments. The Holding Period limit is another aspect of the Volcker Rule that appears to be a concept common to securities-based trading desks, but one that does not transfer easily to a derivative oriented trading desk. For securities based trading desks, the concept of "inventory" is one that can be applied as the financial instruments traded are discrete units (e.g., shares of stocks, number of bonds, etc.) and there is an ability to apply an inventory measurement method—typically FIFO.²³ Many financial institutions have some sort of ageing process in place for securities based trading desks that tracks the turnover of the financial instruments in the trading desk's inventory. These existing processes can be leveraged to establish an HPL for trading desks that make markets in securities.

For derivatives oriented trading desks, the inventory construct needs to reflect the reality that once a derivative contract is executed, it remains on the balance sheet until its maturity, termination or restructuring. More importantly, the risk of the trading desk's market-making activities are managed using risk factors the vast majority of the time (e.g., PV01, Delta, Vega, etc.). While the risk factor sensitivities are measured in discrete units, the ability to apply an aging construct is limited by the contractual tenors giving rise to the risk and the operational configuration of most derivative trading systems. In our work with financial institutions, we have seen a range of approaches including simply setting the HPL equivalent to the tenor limit on the trading desk (a very pragmatic and operationally feasible approach) to more complex approaches based on risk exposure turnover (a risk factor exposure divided by some measure of market liquidity). The usefulness of HPLs for derivatives is still debatable, and the approach taken by firms to address the HPL requirement for derivatives needs to consider these fundamental realities.

23. FIFO refers to "first-in, first-out" inventory accounting method commonly used in financial accounting; the other method is LIFO or "last-in, first-out"

5. Conclusion

Considerable uncertainty remains regarding how regulators will finally interpret the RENTD requirement and what practices will be deemed acceptable from a compliance perspective. Despite the uncertainty, the RENTD requirement is present in the original statutory language and it plays a central role in achieving the broad regulatory objective of eliminating impermissible proprietary trading within financial institutions covered by the Volcker Rule. The key questions that are currently being asked and debated relate to the practical aspects of operationalizing this requirement.

As discussed above, interpretation, and application of the RENTD requirement requires many trading desk-specific determinations and the ability to apply critical new data attributes

at the individual trade level. While these attributes can be retroactively mapped onto historical data sets using common reference fields (e.g., product and counterparty related fields), our experience suggests that doing so introduces considerable data quality issues that undermine the effectiveness of the demonstrable analysis. Firms should be seeking ways to embed the business rules and resulting attributes in their upstream trade capture and risk measurement processes so that sub-portfolio level risk exposures aligned with the Volcker Rule requirements are being produced on a daily basis within production systems. This approach maximizes operational integrity and efficiency and gives trading desks the best chance to achieve the desired balance of market-making activities and risk mitigation.

To do this, many firms impacted by the rule should take a more thoughtful and diligent approach in both their interpretation of the requirements and the subsequent implementation of a compliance program. While the issues of interpretation and application can be complex in specific situations, they are by no means impossible to implement, and with the right methodology and operational approach, much of it can be automated and incorporated into the daily risk management routines of most firms. By embracing the complexity of the RENTD requirement, banking organizations can lead in their industry, navigate risks and opportunities, and disrupt the status quo.



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