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CREDIT RISK TRANSFERS (CRTs)
A HANDBOOK FOR U.S. BANKS

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Authors:

Christopher B. Horn
Cadwalader, Wickersham & Taft LLP
Chris.Horn@cwt.com
(212) 504-6961

Jed Miller
Cadwalader, Wickersham & Taft LLP
Jed.Miller@cwt.com
(212) 504-6821

Andrew Karp
Cadwalader, Wickersham & Taft LLP
Andrew.Karp@cwt.com
(212) 504-6962

Ivan Loncar
Cadwalader, Wickersham & Taft LLP
Ivan.Loncar@cwt.com
(212) 504-6339

Thomas Killian
TWK Advisors LLC
tkillian@twkadvisors.com
(908) 907-7779

Mario J. Mastrantoni
KPMG LLP
mmastrantoni@kpmg.com
(704) 370-4362

Alan J. Kuska
KPMG LLP
akuska@kpmg.com
(312) 665-2156

Tyler J. Swarmer
KPMG LLP
tswarmer@kpmg.com
(724) 980-4252

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Executive Overview

Credit risk transfers (CRTs) for capital optimization and credit risk management are not new but are an increasingly important tool in the proverbial regulatory capital toolbox. European banks and U.S. non-bank agencies (Fannie Mae and Freddie Mac) have used CRTs for many years. The current banking environment and regulatory guidance have heightened bank and investor interest, leading to a recent increase in issuance.

While the majority of CRT transactions in the U.S. have been executed by banks with $100 billion or more in assets, CRTs can also be a useful tool for smaller banks. With 96% of U.S. banks below $10 billion in assets and most without efficient access to U.S. capital markets, the development of the CRT market for regional and community banks could be a critical tool for meeting a broad range of objectives at various points across the credit cycle:

- **Capital Management**

  - Supporting an expected increase in loan demand within new or existing markets or sectors.

  - Alleviating the excess regulatory capital burden associated with loan portfolios that are assigned high credit risk weights but exhibit low actual credit risk.

  - Providing the flexibility to bolster capital ratios to meet or exceed peer group levels without diluting existing ownership.

  - Facilitating regulatory approval of a potential merger or acquisition with or by another bank.

- **Credit Risk Management and Other Strategic Objectives**

  - De-risking existing loans or reducing loan concentration on the balance sheet for a period consistent with the remaining life of the loans.

  - Avoiding selling loans with below market yields that cannot be sold without a loss.

  - Ensuring the bank's resilience during economic cycles or regulatory changes.

  - Enhancing the ability of the bank to respond swiftly to future strategic or competitive opportunities.

This handbook explains how CRTs work, how they are priced and structured, and how they compare with other alternatives for capital optimization and risk management. We present a simple breakeven pricing model to help banks evaluate CRT costs against alternative options. The model incorporates both the CRT's configuration and the bank's weighted average cost of regulatory capital to compare the CRT's cost with the cost of traditional capital instruments such as common stock, preferred stock, or subordinated debt.

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Our hope is that this detailed handbook will be a useful reference for U.S. banks and other industry participants and that it will help answer some recurring questions about CRTs, including:

- Who should consider using a CRT transaction for capital and risk management purposes?

- What are the different types of CRTs, and how do you select the most appropriate type for your bank?

- What are the five key inputs in the configuration of a CRT?

- How do you size the senior and junior tranches, and how does the SSFA model fit in?

- What are the key legal and accounting issues when considering a CRT strategy?

For ease of reference, this handbook uses a toolbox metaphor, with the top-tray tools consisting of numerator capital instruments such as common, preferred stock and subordinate debt, and the bottom-tray tools consisting of risk-weighted asset reduction tools such as loan sales, untranched whole portfolio hedging, and CRTs. We have presented the various steps in the capital optimization and risk management and we include the "Efficiency Bank" case study to pull it all together.

We have tried to provide a detailed and practical guide to CRTs but encourage you to speak with your financial and legal adviser as you prepare your strategy. We hope that you find this handbook to be a useful tool!

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I. INTRODUCTION: THE REGULATORY CAPITAL TOOLBOX FOR U.S. BANKS

Bank credit risk transfer transactions ("**bank CRTs**" or simply "**CRTs**"), which have been prevalent in Europe for many years, are becoming increasingly common in the United States. They are not recent or novel innovations. As we will explain, the term "bank CRT" is essentially the trade name for what the U.S. bank capital rules (the "**Capital Rules**"),[1] and the international Basel Committee standards, have long referred to as "synthetic securitizations" or "traditional securitizations" that transfer risk in accordance with specified definitional, operational, and due diligence requirements.[2]

CRTs are becoming increasingly relevant because capital and risk management is becoming increasingly complicated and dynamic. CRTs are one of several "tools" in the proverbial regulatory capital toolbox that can help banks manage their credit risks and optimize or improve their regulatory capital ratios:

$$\text{Common Equity Tier 1 Capital Ratio} = \frac{\text{Common Equity Tier 1 Capital}}{\text{Risk} - \text{Weighted Assets}}$$

$$\text{Tier 1 Capital Ratio} = \frac{\text{Tier 1 Capital}}{\text{Risk} - \text{Weighted Assets}}$$

$$\text{Total Capital Ratio} = \frac{\text{Total Capital}}{\text{Risk} - \text{Weighted Assets}}$$

The top tray of the regulatory capital toolbox contains the blunt tools used for building up the numerator in these ratios; namely, raising new capital and retaining earnings. In the bottom tray are the cutting tools used for carving down the denominator: namely, reducing risk-weighted assets.

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[1] The rules establishing minimum capital requirements and overall capital adequacy standards for U.S. banks are set forth in 12 CFR §217.1 *et seq*. (for banks regulated by the Federal Reserve Board), 12 CFR §3.1 *et seq*. (for banks regulated by the OCC), and 12 CFR §324.1 *et seq*. (for banks regulated by the FDIC). The rules are identical in all relevant respects. For convenience, this paper will cite to the Federal Reserve implementation, which is also referred to as Regulation Q.

[2] Fannie Mae and Freddie Mac have also made extensive use of credit risk transfers to remove residential mortgage loan risk from their balance sheets. The use of such transactions by those agencies is discussed later in this paper.

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Top Tray	Bottom Tray
Heavy-Duty Claw Hammer: This "hammer" builds up capital by increasing the amount of ***common equity tier 1 capital***, which involves issuing common equity shares and retaining earnings.	**Hacksaw:** The hacksaw reduces risk-weighted assets by selling existing assets (*e.g.*, mortgage loans) or reducing the origination of new assets.
Ball-Peen Hammer: This "hammer" builds up capital by increasing the amount of ***additional tier 1 capital***, which primarily involves issuing qualifying noncumulative perpetual preferred stock. *Common equity tier 1 capital + additional tier 1 capital = tier 1 capital.*	**Jigsaw:** The jigsaw reduces risk-weighted assets by cutting out a portfolio of assets and hedging that portfolio, on an untranched basis, with a credit derivative or financial guarantee.
Rubber Mallet: The "rubber mallet" builds up capital by increasing the amount of ***tier 2 capital***, which primarily involves issuing subordinated debt and qualifying cumulative preferred stock. *Tier 1 capital + tier 2 capital = total capital.*	**Precision Cutting Tools (CRTs):** CRTs reduce risk-weighted assets by shaving off risk until a block of higher risk-weighted assets (*e.g.*, a portfolio of mortgage loans) is sculpted into a form that has a lower risk weight (*e.g.*, a senior securitization exposure).

In this paper, we present a detailed discussion of the various types of CRTs. We also discuss the costs and benefits of CRTs relative to the other tools in the regulatory capital toolbox. Comparing relative costs and benefits is key to optimizing or improving a bank's credit risk and capital management practices.

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In deciding whether to read on, please consider the following:

- While many recent CRTs in the United States have been conducted by large banks and the GSEs, **CRTs are also a viable tool for regional banks and are increasingly being used by regional banks to optimize regulatory capital**.

- **This paper may be of significant interest to regional banks that are subject to the capital ratios specified in Basel III's generally applicable framework**, each of which references total risk-weighted assets in the denominator:

Ratio	PCA Standards		CCB Standard[3]
	Adequately Capitalized	Well Capitalized[4]	
Common Equity Tier 1 Capital Ratio	≥4.5%	≥6.5%	≥7.0%
Tier 1 Capital Ratio	≥6.0%	≥8.0%	≥8.5%
Total Capital Ratio	≥8.0%	≥10.0%	≥10.5%

> **Toolbox Tidbit – PCA Standard; CCB Standard**
>
> **PCA:** A bank that is not "adequately capitalized" is subject to prompt corrective action (PCA). PCA involves certain remedial actions, including corrective programs to increase capital[5] and heightened examination coverage.[6]
>
> **CCB:** The capital conservation buffer (CCB) is a 2.5% buffer that is added to the "adequately capitalized" standard. The CCB standard (adequately capitalized ratio *plus* CCB) must be satisfied to avoid limitations on capital distributions and discretionary bonus payments.[7]

- **This paper may *not* be of much interest to banks that are not subject to the Basel III capital ratios described above**, such as:

  o *Qualifying community banks that have elected to use the community bank leverage ratio (CBLR) framework*. A community bank qualifies for the CBLR framework if, among other requirements, it has less than $10 billion in assets and has a leverage ratio greater than 9%.[8] A community bank that has elected to use the CBLR does not benefit from reducing

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[3] CCB refers to the capital conservation buffer. *See* Toolbox Tidbit – PCA Standard; CCB Standard for a further explanation.

[4] Note also that in order to be considered well capitalized, the bank must have a leverage ratio of 5.0% or greater (or 6.0% or greater, if the bank is a subsidiary of a global systemically important bank holding company). See 12 C.F.R. §208.43(b)(1)(i)(D). The leverage ratio is the ratio of tier 1 capital to average total consolidated assets. See 12 C.F.R. §217.10(b)(4). Thus, any reduction of the risk weights assigned to any portion of a bank's total consolidated assets will not have the effect of increasing the bank's leverage ratio.

[5] *See* 12 C.F.R. §208.44.

[6] *See* 12 C.F.R. §208.45.

[7] *See* 12 C.F.R. §217.11(a).

[8] *See* 12 C.F.R. §217.10(a)(2). The leverage ratio is the ratio of tier 1 capital to average total consolidated assets. *See* 12 C.F.R. §217.12(b) and 12 C.F.R. §217.10(b)(4).

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the risk-weights on its assets because (a) the denominator of the CBLR leverage ratio is average total consolidated assets, not risk-weighted assets, and (b) that community bank is deemed to have met the capital ratios specified under Basel III so long as it continues to meet the qualification requirements, including the 9% minimum leverage ratio.

- o *Small bank holding companies that are subject to the Small Bank Holding Company and Savings and Loan Holding Company Policy Statement.* A small bank holding company is subject to the policy statement if, among other things, it has less than $3 billion in assets and is not engaged in significant non-banking activities.[9] A small bank holding company that is subject to the policy does not benefit from reducing the risk weights on its assets because it is deemed to be well capitalized if it satisfies the alternative capital requirements set out in Appendix C to Regulation Y.[10] Those alternative capital requirements do not utilize risk-weighted assets.[11]

Toolbox Tidbit – Capital at Small BHC Level and Bank Subsidiary Level

Even if a small bank holding company is not itself subject to the Basel III's capital ratios pursuant to the policy statement described above, each of its bank subsidiaries is subject to those capital ratios unless that bank subsidiary is eligible for, and has elected to follow, the CBLR framework. As such, the small bank holding company would benefit from risk-weighted asset reduction at the bank subsidiary level.

Toolbox Tidbit – Distribution of Banks, Banking Assets and Banks Subject to Basel III Ratios

Both bank size and banking assets follow a power law distribution. The large majority of all banks are small banks; the large majority of all banking assets are held by large banks. *See* Appendix 1 (Distribution of Bank Size and Banking Assets).

As of September 30, 2024, there were 4,434 banks in the U.S.

- About 4,300 of the 4,434 banks have less than $10 billion in assets. Only about 1,650 of those banks have adopted the CBLR framework.

  - o The remainder either (i) did not qualify for the CBLR due to the minimum 9% leverage ratio or other requirements or (ii) elected not to use CBLR due to the need to maintain the minimum 9% leverage ratio and satisfy the other requirements.

  - o In total, only about 40% of banks that are eligible to use the CBLR based on asset size have elected to do so due to the higher leverage ratio and other requirements.

- In all, about 2,800 banks (*i.e.*, 63% of all banks) are subject to the Basel III capital ratios, either at the bank holding company level or at the bank level.

Source: S&P Global Market Intelligence data as of September 30, 2024.

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[9] *See* 12 C.F.R. §225 (Appendix C).

[10] *See* 12 C.F.R. §25.2 (fn. 1).

[11] Among the alternative requirements is that the parent bank holding company has a *pro forma* debt to equity ratio of 1.0:1 or less. *See* 12 C.F.R. §225 (Appendix C).

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The transactions explained in this paper go by a variety of names, the most common of which are CRT ("credit risk transfer" or "capital relief trade"), SRT ("significant risk transfer" or "synthetic risk transfer"), and – depending on format – CLNs ("credit-linked notes") or CDSs ("credit default swaps"). We use **CRT** ("**credit risk transfer**") because of its common use in the U.S. market[12] and because it accurately describes the essence of these trades: the transfer to one or more third parties of a portion of the credit risk associated with a portfolio of risk-weighted assets owned by a bank.

As we will explain, a CRT can accomplish this transfer of credit risk *via* a "traditional securitization" involving an accounting sale of the underlying loan assets or, more commonly, *via* a "synthetic securitization" involving a credit default swap or financial guarantee and not involving a sale or transfer of the underlying loan assets.

In a purely economic sense, any *bona fide* transfer of a portion of the credit risk associated with a bank's assets will render the assets less risky for the bank to hold. While any such *bona fide* transfer may affect the amount of *economic* capital that a bank should hold, only those risk transfers that meet specific regulatory criteria affect the amount of *regulatory* capital that a bank must hold. Regulatory safeguards are intended to ensure that the amount of capital satisfies various regulatory policy goals, including (i) absorption of losses, (ii) promotion of public confidence in the banking system, (iii) restriction of excessive asset growth, and (iv) protection of depositors and the FDIC deposit insurance fund.[13]

The basic premise of CRTs is that the credit risk associated with a defined portfolio of bank assets[14] is "tranched" (*i.e.*, sliced or divided) into a **senior credit tranche** (less risky) and one or more **junior credit tranches** (more risky). The bank retains the credit risk associated with the senior tranche and one or more third parties assumes the credit risk associated with the junior credit tranche(s).

The **senior credit tranche**, which is retained by the bank, is considered a "securitization exposure" and the bank must hold a commensurate amount of risk-based capital against that securitization exposure. Senior securitization exposures can have a risk-weight as low as 20%.[15]

The **junior credit tranche(s)** are either (1) hedged by the bank, in the case of a "synthetic CRT," or (2) turned into a security and sold to investors, in the case of a "cash CRT." In the case of synthetic CRTs, which are more common than cash CRTs:

- The junior credit tranche(s) are hedged by the bank with a recognized "credit risk mitigant" on an unfunded or funded basis.

- The Capital Rules recognize three **credit risk mitigants**:

    a. An **eligible credit derivative** is used in most unfunded synthetic CRTs and typically consists of a credit default swap that meets specified eligibility requirements.

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[12] While "SRT" is the established acronym in Europe, "CRT" has been widely used in the U.S. due in large part to the similarity with the successful CRT programs that Fannie Mae and Freddie Mac have had in place for many years.

[13] These four essential functions of bank capital are discussed in Section 2.1 of the FDIC's Risk Management Manual of Examination Policies (the "**FDIC Manual**").

[14] Examples of such assets include, but are not limited to, residential or commercial mortgage loans, auto loans, corporate loans, and capital call subscription facilities.

[15] 20% is the minimum risk weight that can be assigned to a securitization exposure under the Simplified Supervisory Formula Approach (SSFA). We will discuss the SSFA in more detail in this paper.

b. An **eligible guarantee** is used in some unfunded synthetic CRTs and typically consists of an unconditional financial guarantee that meets specified eligibility requirements.

c. **Financial collateral** is used in all funded synthetic CRTs and typically consists of cash or cash equivalents.

▪ If a synthetic CRT utilizes an eligible credit derivative or eligible guarantee, it is referred to as "unfunded." If a synthetic CRT utilizes financial collateral, it is referred to as "funded."

A summary and illustration of the basic elements of CRTs is provided on the following page.

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Synthetic CRTs – Illustration of the Basic Elements

<u>**Reference Portfolio of
Bank Assets**</u>

Credit losses allocated from the bottom up.	***Senior Credit Tranche***

Senior credit tranche transformed into a senior securitization exposure which the bank retains. Credit risk weight on the senior securitization exposure can be as low as 20%. Securitization exposures are typically sized to be as large as possible consistent with that 20% level.

Junior Credit Tranche

The bank either sells the junior credit tranche (a "**cash SRT**") <u>(1)</u> or hedges it with a recognized credit risk mitigant on either an *unfunded* or *funded* basis (a "**synthetic SRT**"). <u>(2)</u>

- *Unfunded*: Use "eligible credit derivative" or "eligible guarantee." Substitute risk weight of the derivative counterparty or guarantor (typically, 20%). <u>(3)</u>

- *Funded*: Use credit derivative or guarantee secured by qualifying "financial collateral." Substitute risk weight of the collateral (typically, 0-20%). (4)

<u>Notes</u>:

(1) In a "cash CRT," the bank transfers all or a portion of the credit risk of the underlying exposures in a sale, contribution or other means of transfer that is not a credit derivative or guarantee.

(2) In a "synthetic CRT," the bank transfers all or a portion of the credit risk of the underlying exposures through the use of a credit derivative or guarantee, while retaining ownership of the underlying exposures.

(3) In an "unfunded synthetic CRT," the bank enters into a guarantee or credit derivative that meets certain eligibility requirements, including that the guarantor or derivative counterparty is an "eligible guarantor." Because the guarantor or derivative counterparty is an "eligible guarantor," and because the guarantee or derivative satisfies certain additional eligibility criteria, the guarantee or credit derivative can stand on its own as a credit risk mitigant and does not need to be secured by financial collateral.[16] The risk weight of the underlying assets is replaced with the risk weight of the guarantor or derivative counterparty (typically, 20%).

(4) In a "funded synthetic CRT," the bank enters into a guarantee or credit derivative that is not necessarily "eligible" – typically because the guarantor or the derivative counterparty is either a special purpose entity ("**SPE**") or other type of entity that does not qualify as an "eligible guarantor" – but that is secured by qualifying financial collateral. In this case, it is the financial collateral (and not the guarantee or derivative) that is the credit risk mitigant. The risk weight of the underlying assets is replaced with the risk weight of the financial collateral that secures the guarantee or derivative (typically, 0-20%).

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[16] As we explain later in this paper, while financial collateral is not required for regulatory capital purposes where the guarantee or credit derivative is "eligible," separate regulations applicable to derivatives may require the posting of margin.

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A. A (Very) Brief History of CRTs

Beginning with the implementation of the Basel II standards in December 2007, and continuing through the implementation of the Basel III standards in October 2013, the Capital Rules have provided the blueprint for CRT transactions of the type we see today; namely transactions that are "synthetic securitizations" and "traditional securitizations" that meet certain specified definitional, operational, and due diligence requirements. Although Basel I did not include such a blueprint as both securitizations and credit derivatives were in their infancy, the banking regulators published guidance as securitizations and credit derivatives began to emerge as tools that could allow banks to transfer risk synthetically *via* transactions that resemble today's CRTs.[17]

Banks in Europe have used the "modern" form of CRTs (*i.e.*, those contemplated by Basel II and Basel III) for many years. In the United States, although most of the regulatory architecture for CRTs has been in place since the adoption of Basel II in 2007, the use of CRTs by banks in the U.S. lags behind their use in Europe.[18] The divergence between the U.S. and Europe can be explained, in part, by a combination of structural,[19] regulatory,[20] and accounting differences.[21]

The gap between the U.S. and Europe has begun to shrink, as increasing numbers of U.S. banks have begun to reach for the CRTs in the capital toolbox. According to the IACPM, EU banks' share of the market for CRTs has shrunk from over 80% in 2016 to 62% by the end of 2023.[22]

Interestingly, it was the use of credit risk transfer transactions by non-banks that helped lay the foundation for the bank CRT market in the U.S. In mid-2013, Freddie Mac executed its first credit risk transfer transaction, which it called Structured Agency Credit Risk (STACR), followed by Fannie Mae later in the year when it issued its own transaction referred to as Connecticut Avenue Securities (CAS). These transactions marked a significant shift in how the government-sponsored enterprises ("**Enterprises**")

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[17] As the banking regulators explained in the adopting release for Basel II, "Over the last several years, the agencies have published a significant amount of supervisory guidance to assist banks with assessing the extent to which they have transferred credit risk and, consequently, may recognize any reduction in required regulatory capital as a result of a securitization or other form of credit risk transfer." *See* 72 Fed. Reg. 69288, 69361 (Dec. 7, 2007). Footnote 94 on p. 69361 provides citations to that Basel I-era guidance.

[18] As the Basel standards seek to ensure international consistency in bank regulatory capital standards, one would expect those consistent standards to lead to generally consistent capital management practices. While more should be done to foster the growth of CRTs in the U.S., the recent increase in CRT transactions is a hopeful sign that the Basel project is working as intended.

[19] For example, small- and medium-sized enterprise (SME) loans, single family mortgages, and municipal financings are attractive asset-classes for CRTs due to high risk weights, concentration of risk, or both. In the U.S. market, however, Small Business Administration (SBA) loans largely supplanted the need for a CRT market for SME loans. The emergence of securitization through Fannie Mae and Freddie Mac to provide primary credit support for qualifying mortgages reduced the need for CRTs for qualifying mortgages (QM) but left open the need for CRT support for non-QM loans. Similarly, the well-developed public market for municipal finance loans in the U.S. market reduced the need for CRTs for this market in the U.S.

[20] For example, in Europe, bank directly-issued CLNs generally do not need regulatory approval (although notice to regulators is required in some jurisdictions), whereas in the U.S., banks must obtain approval for such a transaction, which adds timing and execution risk.

[21] Generally, under IFRS 9 and ASC 326 under US GAAP, CRT transactions do not provide relief from recording a full allowance for credit losses. Under US GAAP, credit enhancement must explicitly be "embedded" in the loan (*e.g.*, government-guaranteed mortgage loans). IFRS has similar concepts. However, under IFRS, the allowance reflects expected credit losses over the next 12 months (unless the loans have experienced a significant increase in credit risk), while under GAAP, the allowance reflects expected credit losses over the lifetime of the loan.

[22] *See* International Association of Credit Portfolio Managers, Synthetic Securitization Market Volume: 2016 – 2023 Select Survey Results, at p. 7.

managed their credit risk exposure. According to the FHFA, "[f]rom the beginning of the Enterprises' Single-Family CRT programs in 2013 through the end of 2023, the Enterprises transferred a portion of credit risk on approximately $6.7 trillion of unpaid principal balance" of single-family residential mortgages.[23]

Not only have these transactions provided significant protection to taxpayers,[24] they have built a diverse base of sophisticated investors with a deep knowledge of, and interest in, CRTs. This investor base includes asset managers, hedge funds, insurance companies, and REITs, creating a new market for the pricing and trading of mortgage credit risk.[25] This broad and deep pool of sophisticated investors not only provides a source of stable funding for CRTs, it also helps to ensure that the credit risk shed by banks *via* CRTs does not become overly concentrated in a narrow or shallow portion of the non-banking sector.

B.   Why Now? Why Bother?

At this point, it's fair to ask: "If CRTs have been around for so long, why are they getting so much attention now?" CRTs have been getting increased attention in the U.S. for a variety of reasons, including:

- The hammer and the hacksaw may not be good tools for the job of capital and risk management in the current macroeconomic environment.

  o The proverbial hammer (increasing the numerator by raising capital) may not be a good tool during periods of high interest rates and low bank stock valuations where bank cost of capital is high. During those periods, for many banks, the hammer approach of raising capital is simply too expensive and too dilutive of the equity interest represented by previously-issued common stock. Moreover, most banks have limited access to the common equity and preferred equity capital markets.

Toolbox Tidbit – Most Banks Have Limited Access to the Capital Markets

As we explain in more detail later, common stock and preferred stock are key components of "tier 1" regulatory capital. As a practical matter, there are only about 200 major exchange-traded banks in the U.S. that have efficient access to the common equity or preferred capital markets. The large majority of banks in the U.S. are either (i) below $10 billion in assets, (ii) private, or (iii) Sub-Chapter S banks with structural constraints to capital raising. Because of their limited market access to capital, the hammer approach may not be a practical tool for over 96% of banks. Moreover, large credit unions with assets of $500 million or more in assets are now subject to Basel III capital requirements and have no ability to issue common stock.

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  o The proverbial hacksaw (decreasing the denominator by selling assets) may not be a good tool because the significant increase in interest rates in 2022 and 2023 has reduced fixed rate loan asset values. While rates have moderated recently, in the current interest rate environment, the hacksaw approach of reducing risk-weighted assets may result in banks selling their assets at a loss.

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[23] *See* Credit Risk Transfer Progress Report (Fourth Quarter 2023) (published: 4/11/2024).

[24] *See*, *e.g.*, Moody's report: Who Bears the Risk in Risk Transfers? (Aug. 2017) ("Fannie's and Freddie's capital market CRT deals ... offer taxpayers significant protection, particularly in times of economic stress").

[25] *See* Finkelstein, D., Strzodka, A., and Vickery, J., *Credit Risk Transfer and De Factor GSE Reform*, Federal Reserve Bank of New York Economic Policy Review 24, No. 3 (Dec. 2018), at 100-101.

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- The job of capital planning and credit risk management has always been difficult, but it is particularly difficult now.

  - The FDIC Manual's description of sound capital planning illustrates why it is so important for a bank to have access to the full set of capital management tools. Without such access, a bank with a capital plan is like a builder with a detailed blueprint but only a hammer and hacksaw to build with.

    "[Bank] management performs capital planning to ensure that capital protection is commensurate with the [bank's] financial condition, business and growth plans, holding company support (if applicable), and projected capital distributions.... [C]apital planning is essential for setting an institution's capital cushion, establishing asset growth and funding targets, pursuing new products or markets, and determining whether dividends returning capital to shareholders are appropriate and reasonable.... Management has a number of matters to consider when devising a capital plan, including budgets and strategic plans, expectations for loan quality through a full economic cycle, merger and acquisition objectives, and competition within the [bank's] markets."[26]

  - Recently, various factors have further complicated the job of capital planning and credit risk management:

    - Concerns about commercial real estate loan concentration have increased focus on credit quality and loss reserve coverage.[27]

    - While the U.S.'s implementation of Basel III "Endgame" has not been finalized, indications are that changes to the Capital Rules would increase capital requirements for large banks with $250 billion or more in assets.[28] These large banks hold the large majority of all banking assets in the U.S. Even if these potential rule changes do not directly impact banks with total assets of less than $250 billion, they would apply to banks holding approximately 65% of U.S. banking assets and would therefore impact loan pricing and the availability of credit.

    - Potential changes in the regulatory environment following the U.S. elections in November 2024, as well as possible changes in the leadership of the bank regulatory agencies, place a premium on flexibility in capital structure and credit risk management.

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[26] *See* FDIC Manual, at 2.1-2.

[27] Since 2006, regulators have focused on the CRE concentration ratio, which measures the total amount of certain types of CRE lending relative to total capital, as well as the growth in such lending. Banks that exceed a 300% concentration ratio are subject to increased regulatory scrutiny. Recently, the banking regulators have expressed increased concern about banks that exceed the 300% threshold.

[28] The prospects for the implementation of Basel III Endgame in the United States are very uncertain. The initial proposal, which was published in the Federal Register on September 18, 2023, was widely opposed by banks and other market participants. Among other things, the new expanded risk-based approach would lead to much higher risk weights for securitization exposures due to the doubling of the supervisory calibration parameter (often referred to as the "p-factor") from 0.5 to 1.0, a change which overwhelms the effect of (i) lower risk weights on certain underlying exposures, such as auto loans, and (ii) a 15% risk-weight floor on securitization exposures, which is lower than the 20% floor under the standardized approach. The banking regulators have since acknowledged that "broad and material changes" are required to the proposal. In a speech on September 10, 2024, by Federal Reserve Vice Chair for Supervision, Michael S. Barr previewed some aspects of a planned reproposal, including that banks with assets between $100 billion and $250 billion would no longer be subject to the endgame changes, other than the requirement to recognize unrealized gains and losses of their securities in regulatory capital (AOCI). Vice Chair Barr's speech did not specifically refer to any changes in the proposal as it relates to the calculation of risk weights for securitization exposures. As of the date of this paper, no reproposal has been released by the banking regulators for public review and comment.

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- With the hammer and hacksaw not being suitable for the job for most banks, and with the job getting harder, capital planning is now more complicated and dynamic than ever. Management and boards are required to reach for other tools in the capital toolbox, including CRTs.

  - While the hammer (raising new capital) is effective at providing an additional cushion against the risk of credit losses, it doesn't directly reduce or manage that risk.

  - Similarly, while the hacksaw (selling assets or limiting the origination of new assets) is effective at reducing the risk of credit losses, it may require a bank to sell assets at a loss or to stop engaging in otherwise profitable lending.

  - CRTs, on the other hand, are highly effective risk-management tools because they provide significant flexibility, including by providing credit protection whose term matches the maturity of the loans covered thereby.

- The usefulness of CRTs has been highlighted and enhanced over the last 18 months.

  - Rating agencies have confirmed the positive impact on credit ratings derived from use of CRTs. In February 2024, Standard & Poor's issued a report stating that it recognizes CRTs as credit risk mitigants in the calculation of its risk-adjusted capital (RAC) ratio, which is Standard & Poor's primary solvency metric for banks.[29]

  - Regulators have recognized the benefit of CRT loss protection in their stress test models.[30]

  - The Federal Reserve released technical guidance in September 2023, which has provided the CRT market with more regulatory clarity with respect to CRT transactions involving credit-linked notes.[31]

- An additional important benefit of CRTs is that the premiums paid by the bank to the credit protection provider may be tax deductible depending on the bank's particular tax circumstances.[32] As such, CRTs are one of the only potentially tax deductible alternatives to raising tier 1 capital.

From the individual bank perspective, management and board decisions on how to optimally capitalize the bank require an understanding of all the tools for minimizing the after-tax weighted average cost of capital while providing a sufficient capital cushion to remain well capitalized under stress scenarios and avoid capital conservation buffer (CCB) restrictions on capital distributions and discretionary bonus payments. The purpose of this paper is to provide information about CRTs that will help bank management and board members make those decisions.

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[29] *See* Banks Ramp Up Credit Risk Transfers to Optimize Regulatory Capital (Feb. 22, 2024).

[30] For example, in summarizing the results of the 2024 supervisory stress test, the Federal Reserve noted that "Synthetic securitizations are a form of loss mitigation in which a bank partially transfers credit risk on specific portfolios to outside investors through credit derivatives or guarantees. The Federal Reserve incorporated a richer dataset and considered this type of credit protection in modeling fair-value-option/held-for-sale loan losses."

[31] We will discuss this guidance, and all of the major forms of CRT, in more detail later in this paper.

[32] Banks should consult their own tax advisors on this and other Federal income tax implications involving CRTs.

What Next?

The remainder of this paper is organized as follows:

- **Planning and Prepping: A Review of the Regulatory Capital Toolbox.** We review the tools in the capital toolbox, including CRTs, and discuss their relative merits in optimizing bank capital.

- **Carving and Cutting: The User's Manual for CRTs.** We provide a detailed description of the various types of CRTs. We explain how they work, and highlight their relative advantages and disadvantages.

- **Measuring and Adjusting: GAAP Accounting Considerations.** We provide an overview of some important accounting considerations, including credit derivative mark-to-market, "financial guarantee" treatment and the derivative scope exception, and the CECL/loan loss reserve.

- **Finishing and Applying: Efficiency Bank Case Study.** We introduce a hypothetical bank, called Efficiency Bank, and demonstrate how CRTs can be used, along with the other tools, to help the bank meet its capital management goals.

- **Filing and Sanding: Legal Considerations.** We review various legal topics, such as risk retention, the Volcker Rule, and conflicts of interest (Securities Act Rule 192).

- **Buffing and Polishing: Conclusion.** We provide our summary and offer some thoughts on the road ahead, including strategies for fostering the development of CRTs in the U.S.

We also provide a Glossary, as well as a list of Frequently Asked Questions.

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II. PLANNING AND PREPPING: A REVIEW OF THE REGULATORY CAPITAL TOOLBOX

According to the "law of the hammer," when the only tool you have is a hammer, every problem looks like a nail. If the capital hammer was the only tool available to banks, then every problem involving regulatory capital ratios would look like a numerator.

Fortunately, the regulatory capital toolbox includes more than just the capital hammer. By providing both the top tray (numerator) tools, including the capital hammer, and the bottom-tray (denominator) tools, including CRTs, the Capital Rules recognize that reducing the risks associated with a bank's assets can be just as effective as continuing to bear those risks but hedging them with more capital.[33]

In this section, we will review all of the tools in the regulatory toolbox, including CRTs, and discuss their relative costs and benefits in optimizing or improving regulatory capital ratios. In the next section, we will open the "user's manual" for CRTs, which includes a description of the all-important legal requirements for CRTs. After that, we present a hypothetical case study in which we walk Efficiency Bank through a capital management project.

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[33] A bank's capital can be regarded as a hedge against unexpected changes in the value of the assets (including changes due to credit losses) against which such capital is held. Thus, a capital ratio is, in effect, a hedge ratio (*i.e.*, the amount of the hedge as a proportion of the underlying exposure that is protected by the hedge).

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A. The Top-Tray Tools – Increasing the Numerator

Heavy-Duty Claw Hammer Common Stock	Ball-Peen Hammer Preferred Stock	Rubber Mallet Subordinated Debt

1. CET1: The Heavy-Duty Claw Hammer

What is CET1? In the top tray of the regulatory toolbox is a heavy-duty claw hammer in the form of "**common equity tier 1 capital (CET1)**." Common equity tier 1 capital (CET1) consists primarily of (i) qualifying common stock issued by the bank that meets certain qualifications, (ii) retained earnings[34] and (iii) accumulated other comprehensive income (AOCI), unless the bank has made an AOCI opt-out election.[35] It is considered the highest form of regulatory capital "as it absorbs losses immediately when they occur."[36] In addition, as common shareholders are not entitled to dividends (unless the bank decides to pay them) or to a return of their capital, CET1 represents a permanent hedge against credit losses until CET1 has been reduced to zero.[37]

How much does CET1 cost? While a comprehensive discussion of the cost of equity capital for U.S. banks is beyond the scope of this paper, there are at least four commonly accepted techniques to

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[34] Retained earnings essentially reflect the cumulative amount of net income that a bank has retained rather than distributed to its shareholders as dividends.

[35] AOCI essentially reflects the cumulative amount of gains and losses that are not realized through net income but are instead recognized directly in equity (*e.g.*, unrealized gains or losses on available-for-sale securities). Although the implementation of Basel III Endgame in the U.S. remains uncertain, indications are that the AOCI opt-out may be eliminated for some banks. This change would negatively affect any such banks that carry negative amounts of AOCI on their GAAP balance sheets. Common equity tier 1 capital also consists of (i) common equity tier 1 minority interest, and (ii) common stock issued and held in trust for the benefit of employees as part of an employee stock ownership plan. *See* 12 C.F.R. §217.20(b). Some banks may elect to transfer certain securities to "Held-to-Maturity" to avoid ongoing capital volatility.

[36] *See* Definition of Capital in Basel III – Executive Summary, Bank for International Settlements. Specifically, as credit losses occur on the bank's loan assets, they are recorded as an expense on the income statement, thereby reducing net income. This reduction in net income erodes retained earnings, as retained earnings consist of the cumulative net income that has not been distributed to shareholders.

[37] While the amount of paid-in capital is generally never reduced because it has already been paid-in, the other components of CET1 (retained earnings and AOCI) can fluctuate and have negative values. Thus CET1 is reduced to zero when the amount of paid-in capital (always a positive dollar amount) is completely offset by negative retained earnings and/or AOCI.

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determine the implied after-tax cost of common equity: (1) the capital asset pricing model (CAPM),[38] (2) the normalized ROE approach,[39] (3) the dividend growth model,[40] and (4) the reciprocal of P/E model.[41]

Over time, using these four methods, the industry-estimated after-tax cost of common equity capital for U.S. banks has ranged from 10% to 13%. **For purposes of this paper, we will assume the after-tax cost of bank common equity to be 12%.[42]**

2.   *AT1: The Ball-Peen Hammer*

What is AT1? The top tray of the regulatory toolbox also contains a ball-peen hammer in the form of "**additional tier 1 capital (AT1)**." Additional tier 1 capital consists primarily of unsecured and paid-in capital instruments that are (i) subordinated to depositors, subordinated debtholders and general creditors of the bank and (ii) issued with no maturity or feature that creates an incentive to redeem (such as a dividend step-up), among other requirements.[43]

Qualifying **noncumulative perpetual preferred stock** is the prototypical form of additional tier 1 capital (AT1). Preferred securities rank higher than common equity, but, as noted above, lower than obligations to depositors, subordinated debtholders, and general creditors of the bank. Preferred securities have both equity and fixed income characteristics:

- They are subordinated to debt (like common equity) but senior to common equity (like fixed income).

- Like common equity, they pay dividends (which are not tax deductible) rather than interest coupons (which are generally tax deductible);[44] like fixed income, the dividends are fixed and do not vary with the bank's earnings.

- Perpetual preferred securities have no maturity date (like common equity) but may be callable by the bank after five years (like fixed income)

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[38] The capital asset pricing model measures the volatility of a bank's stock price relative to the risk free rate of return and the long-term expected return on the market. This method is considered most appropriate for large publicly-traded banks and requires a measure of volatility referred to as beta to properly estimate the cost of capital. For the 96% of U.S. banks that are below $10 billion in assets, sub-S banks and private banks, a beta is not available or deemed to be irrelevant. Rating agencies such as Kroll and others publish industry premiums and size premiums that can be used to calculate the cost of equity for these smaller institutions or private institutions.

[39] This approach is based on the median return on equity for banks within the size range of the target bank.

[40] This approach is based on the median for return of equity (ROE), dividend yield, and expected earnings per share (EPS) growth for publicly traded banks within the target bank's size range.

[41] This is essentially a shorthand or trader's method of estimating a bank's cost of equity based on the bank's stock price and multiple of earnings. To be accurate, this method requires that the bank have publicly-traded stock with estimates of future earnings and significant trading volume.

[42] Note, however, that the top 200 major exchange traded banks with a track record of performance, active research coverage, and significant common stock trading volume may have a lower after-tax cost of common equity capital.

[43] *See* 12 C.F.R. §217.20(c).

[44] As previously noted, CRT premiums may generally be deductible depending on the bank's particular tax circumstances. Banks should consult their own tax advisors on this and other Federal income tax implications involving CRTs.

AT1 is considered a somewhat lower form of regulatory capital than common equity because it is less subordinated (*i.e.*, it is senior to common equity) and less permanent (*i.e.*, it may be callable with regulatory approval by the bank after five years). In addition, preferred securities pay fixed dividends. Although the Capital Rules specify that the bank must have full discretion to cancel dividends on AT1 instruments,[45] those instruments do not immediately absorb losses until dividends are actually cancelled.

How much does AT1 cost? Noncumulative perpetual preferred stock, the typical form of AT1, is usually priced as a fixed income instrument. Other than potential voting rights or Board representation, preferred stock investors have limited ability to make changes in adverse circumstances. The market for non-investment grade preferred stock issued by smaller regional and community banks is limited. Preferred stock cannot be called without prior regulatory approval which can limit the issuing bank's financial flexibility.

The after-tax cost of noncumulative perpetual preferred stock is generally (1) lower than the after-tax cost of common stock (CET1), a reasonable estimate of which is 12% (as explained in the previous section), and (2) higher than the after-tax cost of long-term subordinated debt (T2), a reasonable estimate of which 5.25% (as explained in the next section). **For purposes of this paper, we will assume the cost of noncumulative perpetual preferred stock is 9%.**[46]

CET1 + AT1 = T1 (Tier 1 Capital)

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3. *T2: The Rubber Mallet*

What is T2? The last tool in the top tray of the regulatory toolbox is a rubber mallet in the form of **"tier 2 capital (T2)**." Tier 2 capital consists primarily of unsecured and paid-in capital instruments that are (i) subordinated to depositors and general creditors of the bank and (ii) issued with a maturity date of at least five years, among other requirements.[47] T2 also includes the adjusted allowance for credit losses (AACL) up to 1.25% of risk-weighted assets.[48]

Long-term subordinated debt is the prototypical form of tier 2 capital (T2). Long-term debt ranks higher than common equity and preferred stock but, as noted above, lower than obligations to depositors and general creditors of the bank.

T2 is a lower form of regulatory capital than T1 as it is the least subordinated (*i.e.*, it is senior to CET1 and AT1) and the least permanent (*i.e.*, it typically has a fixed maturity date). T2 absorbs losses only after T1 capital has been reduced to zero.

How much does T2 cost? Subordinated debt is typically priced as a fixed income instrument at a spread over the 10-year Treasury. Payments are cumulative and creditors have typical protections. While

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[45] *See* 12 C.F.R. §217.20(c)(vii).

[46] Note, however, that the top 200 major exchange traded banks with investment grade debt ratings may have a lower after-tax cost of preferred stock.

[47] *See* 12 C.F.R. §20(d)(1).

[48] *See* 12 C.F.R. §217.20(d)(3). Amounts of AACL in excess of this 1.25% limit are deducted from the bank's total risk weighted assets (*i.e.*, the denominator of the capital ratios). *See* 12 C.F.R. §217.2 (definition of "standardized total risk-weighted assets," clause (2)).

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the substantial majority of subordinated debt is issued by large, investment grade-rated banks, regional and community banks have been successful in issuing subordinated debt, albeit at much higher pricing.

Subordinated debt is generally priced at a significantly lower coupon than preferred stock from the same issuing bank, and subordinated debt payments are tax deductible. As such, the after-tax cost of subordinated debt is always substantially less than preferred or common stock. **For purposes of this paper, we will assume the after-tax cost of long-term subordinated debt is 5.25% (based on an assumed 7.5% pre-tax cost and an assumed 30% tax rate).[49]**

T1 + T2 = TC (Total Capital)

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4. The Top-Tray Tools May Not Be Optimal for the Job

As we noted earlier in this paper, over 96% of U.S. banks have limited access to the common equity or preferred capital markets. Thus, their ability to raise Tier 1 capital is significantly constrained. Even if a bank does have access to these markets, issuing common equity when the bank's stock is trading below book value is highly dilutive of current shareholders. While bank stock prices have begun to recover somewhat, they still trade well below historical multiples of tangible book value and earnings.

Although the top tray tools increase the numerators of the Basel III capital ratios, they are very costly. As noted above, reasonable assumptions for the after-tax cost of bank regulatory capital[50] are:

- **12%**, for common stock (CET1);

- **9%**, for perpetual preferred stock (AT1); and

- **5.25%**, for long-term subordinated debt (T2).

A bank's weighted average cost of capital ("**WACC**") may be viewed as its average after-tax cost of funding from all sources, including deposits, subordinated debt, preferred stock, and common stock. Deposits are technically not a source of capital for banks but rather a source of liquidity. FDIC insured deposits enable banks to raise funding due to the government guarantee of repaying deposit amounts up to $250,000 per depositor.[51] Therefore, in evaluating cost of capital for a bank, there is priority given to the cost of common stock, preferred stock, and subordinated debt which are the sources of CET1, AT1 and T2 capital, respectively.

In general, a bank will seek to optimize its WACC because the WACC is used to calculate the present value of the bank's future earnings. A lower WACC applied to a given stream of future earnings will lead to a greater present value (*i.e.*, higher bank valuation) than a higher WACC applied to that same stream of earnings.

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[49] Note, however, that the top 200 major exchange traded banks with investment grade debt ratings may have a lower after-tax cost of subordinated debt.

[50] Note that the total "real world" costs of these instruments would also reflect the transaction fees associated with issuing them. Those transaction fees are generally higher for common stock and preferred stock relative to subordinated debt.

[51] If a bank falls below the "well capitalized" standard, it would generally lose access to funding *via* additional/new/rolled-over/renewed brokered deposits. Generally speaking, "brokered deposits" are deposits gathered by third parties. Brokered deposits are an important source of funding for many banks and thus it is important for such banks to meet the "well capitalized" standard.

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Because a bank's *regulatory* capital (*i.e.*, the CET1, AT1 and T2 instruments described above) is an important subset of its total capital, a bank will seek to optimize its weighted average after-tax cost of *regulatory* capital ("**WACC_R**"). To illustrate the general approach for optimizing WACC_R, recall that under Basel III, in order for a bank to meet the CCB standards, it must have a CET1 ratio of 7.0%, a T1 ratio of 8.5%, and a total capital ratio of 10.5%. A bank could use one of three strategies to meet those capital ratios:

1) <u>All CET1 Strategy</u>. Issue common equity (CET1) in an amount sufficient to meet not only the CET1 ratio of 7.0%, but also to meet the T1 ratio of 8.5% and the total capital ratio of 10.5%.

2) <u>Efficient T1 Mix Strategy</u>. Issue common equity (CET1) in an amount sufficient to meet the CET1 ratio of 7.0%. Issue noncumulative perpetual preferred stock (AT1) in an amount necessary to meet not only the T1 ratio of 8.5%, but also the total capital ratio of 10.5%.

3) <u>Efficient T1 and T2 Mix Strategy</u>. Issue common equity (CET1) in an amount sufficient to meet the CET1 ratio of 7.0%. Issue noncumulative perpetual preferred stock (AT1) in an amount necessary to meet the T1 ratio of 8.5%. Issue long-term subordinated debt in an amount necessary to meet the total capital ratio of 10.5%.

The table below displays each of these three strategies, together with its respective WACC_R. As demonstrated below, the Efficient T1 and T2 mix strategy results in the lowest WACC_R.

| | | Strategy | | |
Form of Capital	After-Tax Cost	All CET1	Efficient T1 Mix	Efficient T1 and T2 Mix
CET1 (*e.g.*, common stock)	12.00%	$\mathbf{100}\%\left(=\dfrac{10.5}{10.5}\right)$	$\mathbf{67}\%\left(=\dfrac{7.0}{10.5}\right)$	$\mathbf{67}\%\left(=\dfrac{7.0}{10.5}\right)$
AT1 (*e.g.*, noncumulative perpetual preferred stock)	9.00%	**0%**	$\mathbf{33}\%\left(=\dfrac{10.5-7}{10.5}\right)$	$\mathbf{14}\%\left(=\dfrac{8.5-7}{10.5}\right)$
T2 (*e.g.*, long-term subordinated debt)	5.25%	**0%**	**0%**	$\mathbf{19}\%\left(=\dfrac{10.5-8.5}{10.5}\right)$
WACC_R		*12.0%*	*11.0%*	*10.3%*

Note that the above allocation of capital is optimal only in the case of a bank that seeks to maintain CET1, T1, and total capital ratios of 7.0%, 8.5% and 10.5%, respectively.[52] Any given set of target capital ratios will have its own mix of CET1, AT1, and T2 that produces the lowest WACC_R for those target ratios. The set of formulas[53] for optimizing the allocation of CET1, AT1, and T2 is shown below.

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[52] This efficient mix strategy refers only to the issued forms of capital (*i.e.*, common stock, in the case of CET1, preferred stock, in the case of AT1, and subordinated debt, in the case of T2) and does not consider the impact of other forms of capital, such as the impact on T2 from the adjusted allowance for credit losses (AACL) up to 1.25% of risk-weighted assets.

[53] This set of formulas assumes that CET1 has the highest cost, followed by AT1, and then T2. That assumption is almost always true.

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Optimizing WACC_R

$$\text{Optimal CET1 Proportion} = \frac{\text{Target CET1 Ratio}}{\text{Target Total Capital Ratio}}$$

$$\text{Optimal AT1 Proportion} = \frac{\text{Target T1 Ratio} - \text{Target CET1 Ratio}}{\text{Target Total Capital Ratio}}$$

$$\text{Optimal T2 Proportion} = \frac{\text{Target Total Capital Ratio} - \text{Target T1 Ratio}}{\text{Target Total Capital Ratio}}$$

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B.   The Bottom-Tray Tools – Decreasing the Denominator

Hacksaw Sale of Whole Portfolio	Jigsaw Untranched Hedge of Whole Portfolio	Precision Cutting Tools Synthetic CRTs Cash CRTs

The purpose of the bottom tray tools – the hacksaw, the jigsaw and the precision cutting tools (synthetic CRTs and cash CRTs) – is to reduce a bank's "risk-weighted assets." Recall that risk-weighted assets are used in the denominator of the Basel III capital ratios. Thus, reducing risk-weighted assets has the effect of increasing (improving) each of those ratios.

To aid in our review of the bottom tray tools, it is helpful to organize those tools by reference to (1) what they do to the portfolio of underlying loans (sold / removed from balance sheet *vs.* hedged / remain on balance sheet) and (2) what they do to the credit risk of the underlying loan exposures (not tranched *vs.* tranched).

	Credit Risk NOT Tranched	**Credit Risk Tranched**
Assets Sold / Removed from Balance Sheet	Hacksaw (Sale of Whole Portfolio)	Cash CRT
Assets Hedged / Remain on Balance Sheet	Jigsaw (Untranched Hedge of Whole Portfolio)	Synthetic CRT

1.   *Hacksaw (Sale of Whole Portfolio)*

The hacksaw is a crude tool for reducing a bank's risk-weighted assets. Using the hacksaw, a bank can simply shed assets *via* a GAAP sale to third-party purchaser. The third-party purchaser could be another bank, an operating company, a debt fund, or an SPE that isn't consolidated with the bank under

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GAAP.[54] In such a sale, the assets (*i.e.*, the sold loans) are removed from the bank's risk-weighted assets.[55]

While the hacksaw is certainly a tool that can reduce a bank's risk-weighted assets, it's a very crude and inefficient tool. Based on the facts and circumstances, it sometimes requires the bank to sell assets at a loss (particularly fixed interest rate loans originated in a lower interest rate environment) or reduce (or even exit) otherwise profitable lines of lending business. This is a particularly inefficient way to reduce the denominator (risk-weighted assets) because it also reduces retained earnings, a key component of CET1, thus also putting downward pressure on the numerator of the capital ratios. In addition, with the hacksaw approach, the bank risks losing customer relationships (if loans are sold "servicing released") or compromising customer relationships (if loans are sold "servicing retained" but subject to servicing covenants that are unfavorable to customers, such as restrictions on loan modifications).

2. *Jigsaw (Untranched Hedge of Whole Portfolio)*

Although not commonly used, an alternative to the hacksaw is the jigsaw. With the jigsaw, a bank can carve out a reference portfolio of loan assets and hedge *all* of the related credit risk[56] in a reference portfolio of assets using a recognized "credit risk mitigant" under the Capital Rules. The three recognized credit risk mitigants are "eligible credit derivatives," "eligible guarantees," and "financial collateral." We will discuss each of those below when we open the user's manual for CRTs.

The basic premise of the jigsaw is that the reference assets remain on the bank's balance sheet but the risk weight applied to those reference assets is the risk weight associated with the credit risk mitigant. Where the credit risk mitigant is an eligible credit derivative or an eligible guarantee, the risk weight is generally that of the counterparty providing the derivative or guarantee. Where the credit risk mitigant is financial collateral, the risk weight generally depends on the form of collateral (or, if applicable, the third-party bank at which such collateral is held).

Note that the jigsaw is a more precise cutting tool than the hacksaw. It allows a bank to reduce its risk-weighted assets *via* a hedge, rather than by selling its loans or slowing its origination of new loans. Compared to CRTs, however, the jigsaw is a crude instrument because it doesn't distinguish between levels (tranches) of credit risk; that is, the entire portfolio is hedged on an untranched basis. Such hedges are expensive and thus are not commonly used as a means of reducing a bank's risk-weighted assets.

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[54] As we explain in more detail later, a "cash CRT" is a transaction in which the bank (i) conducts a GAAP accounting sale of a portfolio of assets to an SPE that is not consolidated with the bank under GAAP, (ii) the issues the junior ABS to investors, and (iii) retains the senior ABS.

[55] Under the Capital Rules, a bank must apply risk weights only to its on-balance sheet exposures, as well as certain off-balance sheet exposures (*e.g.*, lending commitments), and certain other types of exposures, including "securitization exposures."

[56] In other words, under the jigsaw approach, the credit risk remains untranched. As we will explain, it is the tranching of the credit risk (a key definitional component of a "securitization exposure") that distinguishes synthetic CRTs (*i.e.*, synthetic securitizations) from the jigsaw and cash CRTs (*i.e.*, traditional securitizations) from the hacksaw.

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> **Toolbox Tidbit – Credit Insurance**
>
> In any discussion about hedging the credit risk associated with a portfolio of loans, it is reasonable to ask: "What about credit insurance?" Credit insurance is an instrument that meets the definition of "guarantee" under the Capital Rules. However, an insurance company engaged predominantly in the business of providing credit protection is not an "eligible guarantor."[57] As a result, a credit insurance policy written by such an insurance company is not an "eligible guarantee," and thus is not a recognized credit risk mitigant, under the Capital Rules.[58]

3.   Precision Cutting Tools (CRTs)

As shown in the overhead view of the CRT compartment of regulatory toolbox, CRTs can be sorted into four major types.

CRTs			
Synthetic			**Cash**
Unfunded (*i.e., not collateralized*)	Funded (*i.e., collateralized*)		**SPE-Issued ABS**
CDS with Eligible Counterparty	**SPE-Issued CLNs**	**Bank Directly-Issued CLNs**	

a.   Synthetic CRTs

"**Synthetic CRT**" is the trade name for a synthetic securitization that meets all of the applicable definitional, operational, and due diligence requirements set forth in the Capital Rules. In a synthetic CRT, the bank transfers all or a portion of the credit risk of the underlying exposures through the use of a credit derivative or guarantee.[59] The term "synthetic" is used because the bank accomplishes the transfer of credit risk *without selling the underlying loan assets* – the loan assets remain on the bank's GAAP balance sheet.

A variety of instruments could be used to synthetically transfer credit risk, including a credit default swap, a total return swap, a financial guarantee, letter of credit, and insurance policy. For various regulatory and other reasons,[60] **a credit default swap ("CDS") is the most commonly used instrument**. The remainder of this paper will focus on the use of a CDS.

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[57] *See* 12 C.F.R. §217.2 (definition of "eligible guarantor").

[58] Many market participants have argued that credit insurance should qualify as an eligible guarantee. *See*, *e.g.*, the comment letter filed by IACPM and IFTA concerning the Basel III Endgame proposal: Comments re Regulatory capital rule: Proposed amendment applicable to large banking organizations and to banking organizations with significant trading activity (federalreserve.gov). While credit insurance does not reduce a bank's risk-weighted assets, it could positively affect retain earnings (a component of CET1) through a lower provision for credit losses or higher net income.

[59] In "Carving and Cutting: The User's Manual for CRTs," we provide a detailed discussion of how "credit derivative" and "guarantee" are defined and what requirements they must meet.

[60] Many banks may find the accounting treatment of financial guarantees to be more favorable than that of CDS. However, as we explain later in this paper, it is often difficult to achieve financial guarantee accounting due to the payment provisions that are necessary to satisfy regulatory requirements. The legal and accounting benefits and considerations associated with CDS and financial guarantees are discussed later in this paper.

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Under the CDS, the typical arrangement is:

- A reference portfolio (loans owned by the bank) is created and split into a junior credit tranche (*i.e.*, the first loss-absorbing tranche) and a senior credit tranche.

- Each loan in the reference portfolio must meet various eligibility criteria as determined by the parties. In some transactions, the reference portfolio may be subject to "replenishment," which means that for a specified period of time (the "replenishment period"), new eligible assets may be included in the reference portfolio as existing eligible asset amortize or are sold.

- The bank, as credit protection buyer, pays a credit protection fee (usually referred to as a "**premium**") to the credit protection provider.[61] The premium is typically paid monthly or quarterly.

- If a "credit event" occurs with respect to one of the reference portfolio loans, the credit protection seller must make a "**credit protection payment**" to the bank to cover the related net credit loss (the amount of the loan loss net of recoveries). A "credit event" includes failure to pay, and may include other events.[62] The CDS continues to make these credit protection payments until the junior credit tranche has been reduced to zero due to credit losses.

- The CDS has a scheduled termination date that generally corresponds with the maturity of the loan assets, and will terminate early upon the occurrence of specified events, including if the protected notional amount of the junior credit tranche has been reduced to zero as a result of credit losses on the reference portfolio.

i. Synthetic CRT (*Unfunded*): | **CDS with Eligible Counterparty**

An "**unfunded**" synthetic CRT is the most basic type of synthetic CRT. The prototypical structure is a CDS between the bank, as protection buyer, and an "eligible guarantor," as protection seller.[63] An unfunded synthetic CRT is not secured by financial collateral. It is differentiated from the jigsaw by the fact that the credit risk is tranched, with the bank retaining the senior credit tranche and the derivative counterparty hedging the junior credit tranche under the CDS.

In an unfunded synthetic CRT, the bank enters into a guarantee or credit derivative that meets certain eligibility requirements, including that the guarantor or derivative counterparty is an "eligible guarantor." Because the guarantor or derivative counterparty is an "eligible guarantor," and because the guarantee or derivative satisfies certain additional eligibility criteria, the guarantee or credit derivative can stand on its own as a credit risk mitigant and does not need to be secured by financial collateral.[64] The risk weight of the underlying assets is replaced with the risk weight of the guarantor or derivative counterparty (typically, 20%).

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[61] As we will discuss, the credit protection provider could be (1) an eligible counterparty that does not need to post collateral to back its obligations under the CDS (*e.g.*, another bank) and (2) a counterparty, like an SPE, that is not eligible and therefore needs to post collateral.

[62] We will discuss "credit events" in more detail later in this paper.

[63] This form of synthetic CRT is sometimes referred to by market participants as "bilateral CDS."

[64] While financial collateral is not required for regulatory capital purposes where the guarantee or credit derivative is "eligible," separate regulations applicable to derivatives may require the posting of margin.

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CDS with Eligible Counterparty
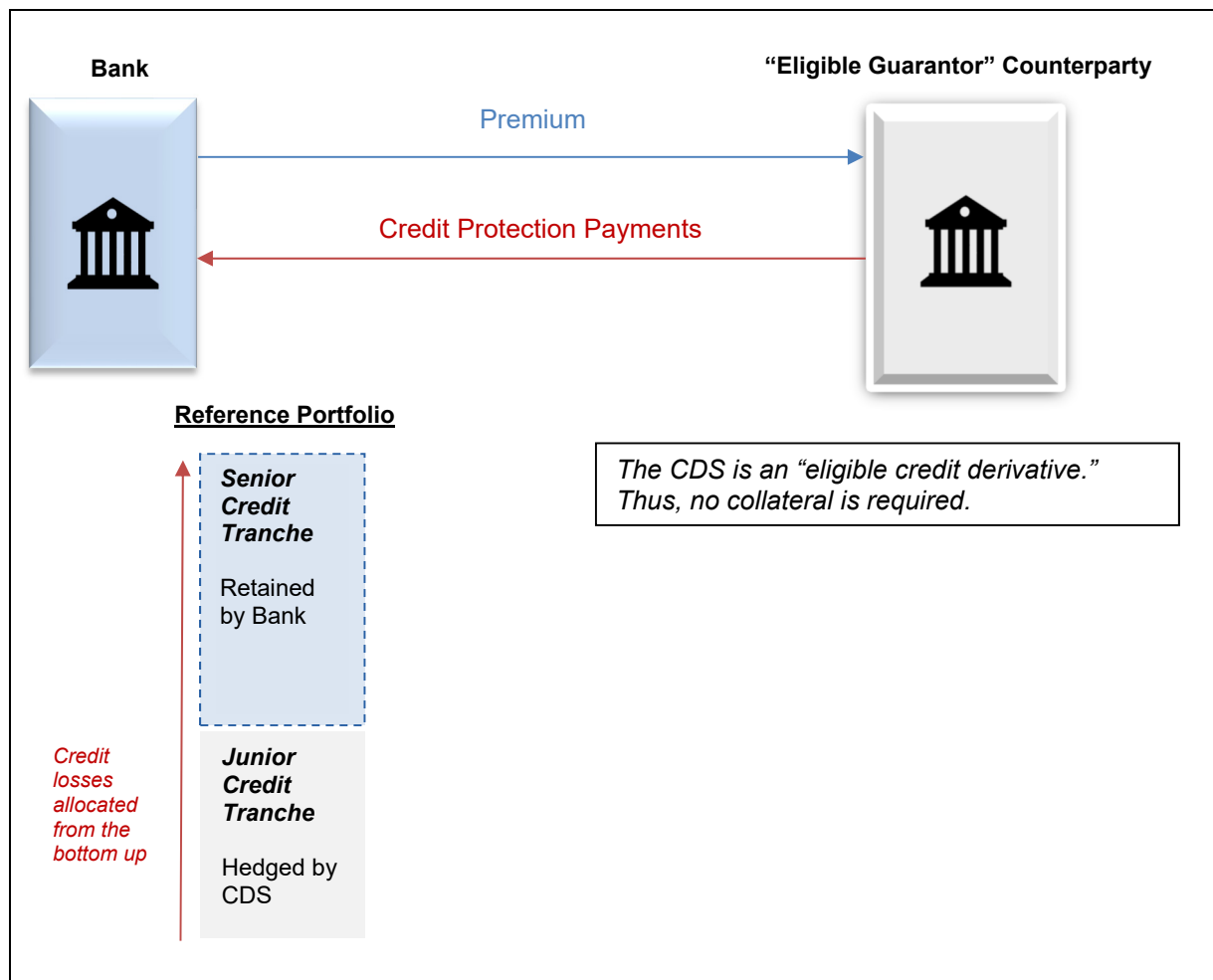
A "**funded**" synthetic CRT is the second type of synthetic CRT. A funded synthetic CRT is secured by financial collateral. The source of that financial collateral is typically the proceeds of the issuance of credit-linked notes ("**CLNs**") to investors. Unlike an unfunded synthetic CRT, the bank is not relying on the creditworthiness of an "eligible" counterparty (like another bank) in collecting credit protection payments under the CDS. Thus, the risk weight of the underlying assets is replaced not with the risk weight of the counterparty (which is just an SPE), but with the risk weight of the financial collateral instead.[65]

There are two types of funded synthetic CRTs: (1) **SPE-Issued CLNs** and (2) **Bank Directly-Issued CLNs**.

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[65] In most cases, the financial collateral is invested in instruments that generate a SOFR return. In such cases, the 20% risk weight floor under 12 C.F.R. §217.37(b)(2) would apply. In the case where the financial collateral is held as cash on deposit, we believe a reasonable basis exists to attribute a zero-percent risk weight to cash on deposit held with a third-party bank. With respect to potential risk arising from the use of a custodian holding the financial collateral, Regulation Q does not expressly require that banking organizations hold regulatory capital against such risk. Instead, the Federal banking regulators have indicated that banking organizations should perform adequate risk-management with respect to such custodial relationships. We are aware of similar transactions where some banks have reflected a 20% risk weight for cash held at a third-party bank above FDIC insurance levels.

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ii.   Synthetic CRT (*Funded*):   **SPE-Issued CLNs**

In the SPE-Issued CLN structure, which is depicted in the graphic below:

- The bank, as protection buyer, and a special purpose entity ("**SPE**"), as protection seller, enter into a CDS. The bank pays the SPE a **premium** and, in exchange, receives **credit protection payments** as credit events occur on the reference portfolio loans. Those credit protection payments end after losses have wiped out the junior credit tranche or the CDS matures.

- The SPE funds itself by issuing CLNs to investors.[66]

- The proceeds of the CLN issuance are the property of the SPE and are transferred by the SPE to a **third-party bank custodian** to be held as **collateral**. The collateral secures two distinct obligations:

  o First, the collateral secures the SPE's obligation to make credit protection payments to the bank under the CDS. The bank has a <u>first priority</u> security interest in the collateral.

  o Second, the collateral secures the SPE's obligation to make principal payments to the investors under the CLN. The investors have a <u>second priority</u> security interest in the collateral.

- *Credit Protection Payments to the Bank; Write Down of CLN Principal*. As credit events occur under the reference portfolio, (1) a corresponding amount of the collateral is released and used by the SPE to make the related credit protection payments to the bank and (2) the principal balance of the CLNs is written down by that same amount.

- *Principal Payments to CLN Investors.* To the extent that collateral is not needed to fund credit protection payments as described above, the collateral is released and paid back to the CLN investors in the form of principal payments on the CLNs. To the extent that the principal balance of CLN is written down as described above, the CLN investors will not receive a principal payment for the written-down amounts.

  o *SOFR Earnings on Collateral*. While cash is sitting at the third-party bank custodian, it is invested in risk-free and highly-liquid permitted investments, such as Treasury bills or money market funds. Those investments generate floating rate investment income. For convenience, will refer to the **SOFR** benchmark[67] to describe the rate of return on those investments, although the actual rate may vary from SOFR depending on the type of permitted investment used.

  o *Interest Payments to CLN Investors*. On a periodic basis (monthly or quarterly), the SPE makes interest payments to investors, which consist of a floating amount (funded by the

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[66] Note that in some funded CRT transactions, the SPE may be funded by means other than the issuance of a CLN, such as a capital contribution or equity investment.

[67] The Secured Overnight Financing Rate (SOFR) is a broad measure of the cost of borrowing cash overnight collateralized by Treasury securities. A more detailed description of SOFR can be found at: <u>Secured Overnight Financing Rate Data - FEDERAL RESERVE BANK OF NEW YORK (newyorkfed.org)</u>.

SOFR returns on the collateral) *plus* a spread (funded by the Premium paid by the bank to the SPE under the CDS).

SPE-Issued CLNs

Bank's Perspective:	Bank is paying the Premium to the SPE in exchange for receiving credit protection payments from the SPE on the reference portfolio.
CLN Investors' Perspective:	Investors are paying for CLNs issued by the SPE in exchange for receiving (i) SOFR (risk-free rate of return) on the amount the investors paid *plus* (ii) a spread (which is generated by the Premium paid by the bank to the SPE).
→	**What the CLN investors receive is NOT the cost of the credit protection to the bank. The investors receive a SOFR return *plus* a spread. The investment of the investors' principal investment generates the cash used by the SPE to pay the SOFR return. The cost of the credit protection to the bank (the Premium) generates the cash used by the SPE to pay the spread.**

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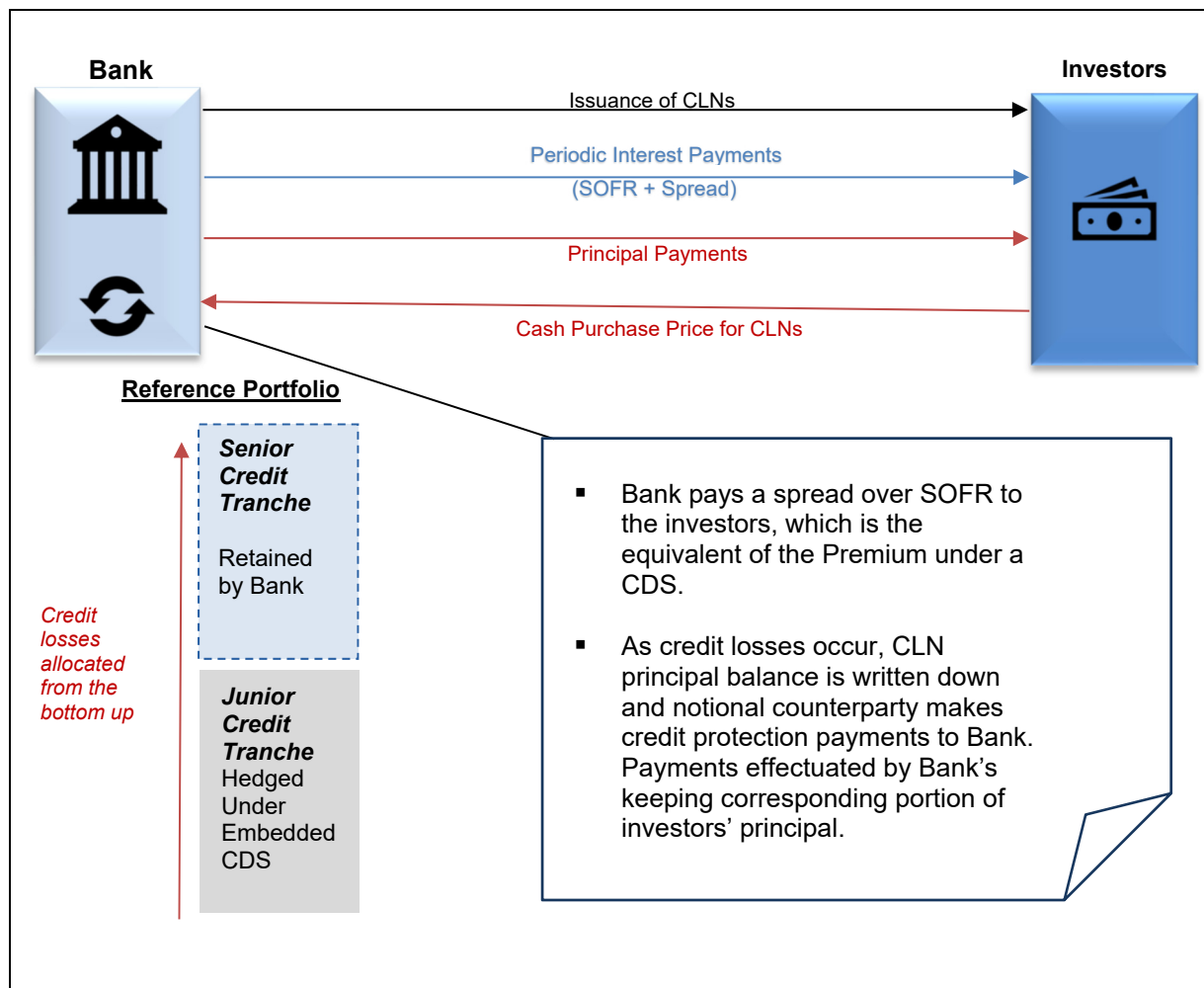iii.   Synthetic CRT (*Funded*):   **Bank Directly-Issued CLNs**

The Bank Directly-Issued CLN structure, which is depicted in the graphic below, has some similarities to, and several important differences from, the SPE-issued variety. The most important difference is that unlike SPE-issued CLNs, Bank Directly-Issued CLNs *are general unsecured obligations of the bank*. The proceeds of the CLN issuance are held directly by the bank, and the CLN investors generally do not have a security interest in those proceeds. Among other things, this means that any credit ratings assigned to Bank Directly-Issued CLNs are generally capped at the credit rating of the bank.

In a bank directly-issued CLN, the bank is the protection buyer under an "embedded" CDS, which is a CDS without a separate counterparty but with a notional counterparty[68] instead. By "notional counterparty," we mean a stand-in for the role of a separate counterparty for purposes of calculating amounts under the embedded CDS. The embedded CDS operates in essentially the same way as in the case of the SPE-issued CLN structure; that is, by specifying the amount of credit protection to which the bank is entitled. As the junior credit tranche suffers losses, the principal balance of the directly-issued CLNs is written down by a corresponding amount and the bank simply continues to keep the corresponding amount of proceeds of the CLN issuance already in its possession. To the extent the CLNs are not written down, the bank makes principal payments to the investors.

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[68] Often confusingly referred to as a "hypothetical" counterparty. The counterparty isn't an imagined entity as one might use when illustrating a point in the form of a hypothetical example.

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Funded Synthetic CRT – Bank Directly-Issued CLNs

Bank

Investors

Issuance of CLNs

Periodic Interest Payments
(SOFR + Spread)

Principal Payments

Cash Purchase Price for CLNs

Reference Portfolio

Senior Credit Tranche

Retained by Bank

Credit losses allocated from the bottom up

Junior Credit Tranche
Hedged Under Embedded CDS

- Bank pays a spread over SOFR to the investors, which is the equivalent of the Premium under a CDS.

- As credit losses occur, CLN principal balance is written down and notional counterparty makes credit protection payments to Bank. Payments effectuated by Bank's keeping corresponding portion of investors' principal.

Bank Directly-Issued CLNs – Reservation of Authority

On September 28, 2023, the Federal Reserve Board ("**FRB**") posted new FAQs to its website to provide additional clarity on the use of CLNs to transfer credit risk. While in some respects the FAQs merely confirm positions that the FRB has already taken in regard to individual CLN transactions, these FAQs are nevertheless important because they publicly memorialize the FRB's view of these products as valid capital and risk management tools.

The FAQs speak to both SPE-Issued CLNs and Bank Directly-Issued CLNs. The FRB's view of SPE-Issued CLNs is relatively straightforward: per the FAQs, the FRB recognizes that properly structured SPE-Issued CLNs constitute "synthetic securitizations" for purposes of Regulation Q and that the collateral for SPE-Issued CLNs can serve as a credit risk mitigant that banks can use to reduce the risk-weighting of the relevant assets.

The FRB's posture toward Bank Directly-Issued CLNs, however, is more nuanced. According to the FRB, unlike SPE-Issued CLNs, Bank Directly-Issued CLNs do not technically satisfy all of the definitional elements and operational criteria applicable to "synthetic securitizations" under Regulation Q, such that banks that issue Bank Directly-Issued CLNs would not be able to automatically recognize the

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capital benefits of such transactions (as would be the case with properly structured SPE-Issued CLNs). The reasons for this are twofold: first, in the FRB's view, Bank Directly-Issued CLNs may not meet the requirement that the credit derivative be executed under standard industry credit derivative documentation;[69] and second, the issuance proceeds from Bank Directly-Issued CLNs generally are owned outright by the issuing bank (rather than held as collateral in which the issuing bank has a security interest).[70]

Nevertheless, the FRB recognized that Bank Directly-Issued CLNs can effectively transfer credit risk; as such, the FRB is willing to exercise its "reservation of authority" to grant capital relief on a case-by-case basis for Bank Directly-Issued CLNs where the only two features of the Bank Directly-Issued CLNs that depart from the strictures of Regulation Q are those described above. In other words, Bank Directly-Issued CLNs can achieve a reduction in risk-weighted assets, but only if the issuing bank specifically requests such relief from the FRB and the FRB decides to grant such relief under its reservation of authority powers.

The FAQs also make clear that the FRB's response to a request may include limitations or conditions that aren't otherwise described in the FAQ. The FRB's written approval typically states that "this action applies only to the subject CLN transaction and other substantially identical CLN transactions up to an aggregate outstanding reference portfolio principal amount of the lower of 100 percent of the bank's total capital or $20 billion." While the approval's extending to "other substantially identical CLN transactions" is favorable, the cap is unfavorable, particularly to larger banks.

Both the outcome and timing of specific requests for relief are uncertain. As a result, there is some movement in the market away from Bank Directly-Issued CLNs in favor of SPE-Issued CLNs.

      b.   Cash CRT: **SPE-Issued ABS**

"Cash CRT" is the trade name for a traditional securitization that meets all of the applicable definitional, operational, and due diligence requirements set forth in the Capital Rules. In a cash CRT, the bank transfers all or a portion of the credit risk of the underlying exposures *other than* through the use of a credit derivative or guarantee. As the reference to "traditional securitization" would imply, the bank sells the assets to an SPE and, as explained in the user's manual, the sale must result in the assets being removed from the bank's consolidated balance sheet under GAAP. The SPE then turns (1) the senior credit tranche into a senior security, which the bank retains, and (2) the junior credit tranche into one or more junior securities, which are sold to investors.[71]

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[69] As noted in the SFA Comment Letter: "This interpretation, however, overlooks the substantive essence of those credit derivatives in favor of a rigid, form-based approach. The embedded credit derivatives used in [Bank Directly-Issued CLNs] provide credit protection superior to that provided by traditional CDS. Unlike traditional CDS, the credit protection provided by the CDS embedded in [Bank Directly-Issued CLNs] is effectively pre-funded when the bank receives the proceeds of issuance from investors. [Bank Directly-Issued CLNs] entail no counterparty risk or security interest risk and provide immediate, pre-paid credit protection. We note that a significant portion of standard industry documentation for credit derivatives addresses counterparty risk, a risk that is not present in [Bank Directly-Issued CLNs]." *See* SFA Comment Letter, at p. 53.

[70] As noted in the SFA Comment Letter: "[C]ash owned by the bank is a superior credit risk mitigant than cash in which the bank has a mere security interest.... Not only has the bank received cash proceeds prior to incurring any credit losses on the reference exposures, it is also not exposed to the counterparty risk associated with depositing the cash proceeds at another bank." *See* SFA Comment Letter, at pp. 55-56.

[71] Note that a Cash CRT will generally require compliance with Regulation RR, the U.S. risk retention rule. Note, however, that the senior credit tranche and/or the junior credit tranche may be structured as loans rather than securities, in which case Regulation RR may not apply. Risk retention is discussed later in this paper in "Filing and Sanding: Legal Considerations."

SPE-Issued ABS[72]
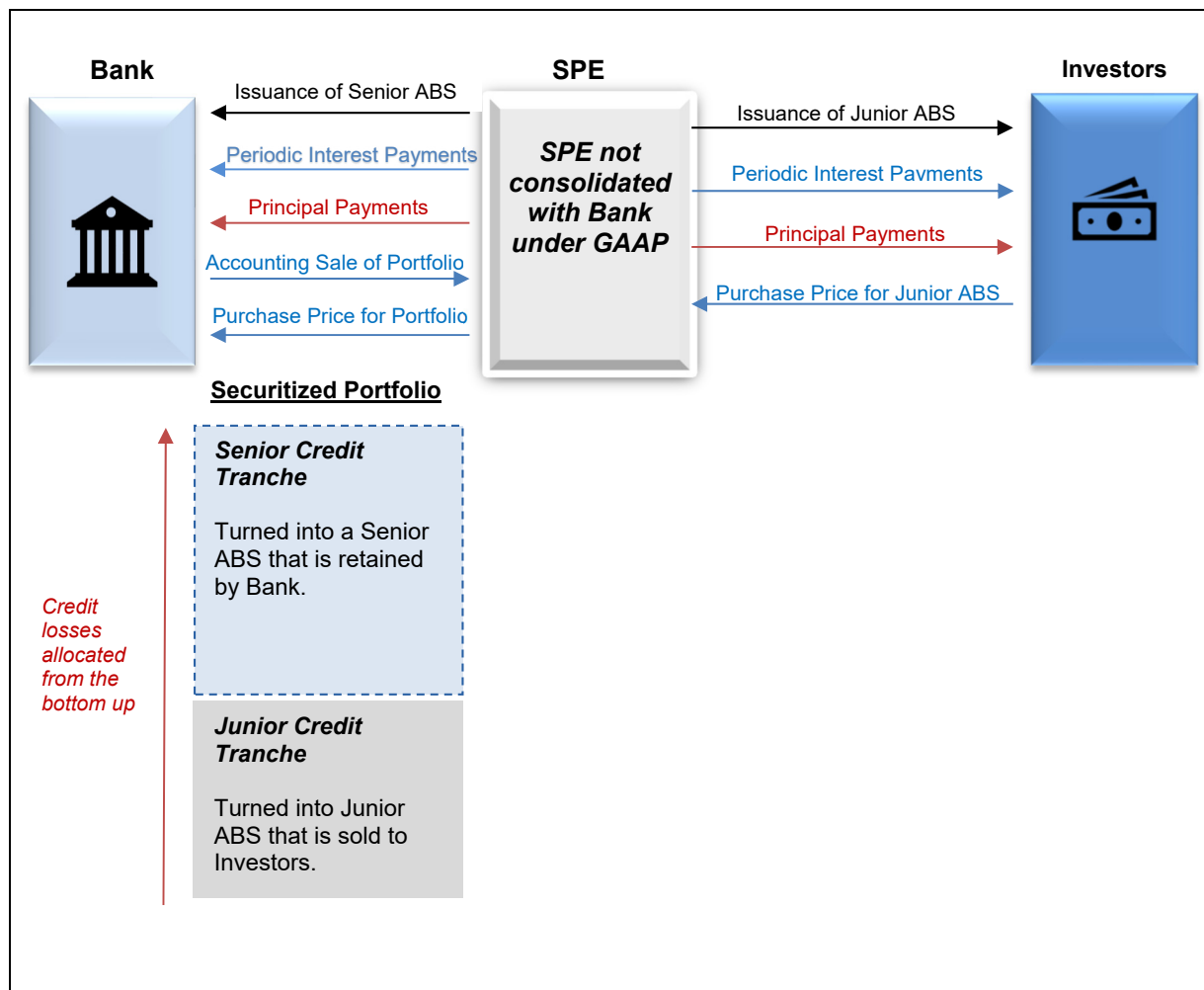
While cash CRTs are effective at reducing a bank's risk-weighted assets, special considerations apply. Unlike synthetic CRTs, cash CRTs involve a sale of the underlying portfolio of assets, thus causing the bank to incur a realized loss if any fair market value loss on the assets since origination is not offset by gain on the sale of servicing or release of reserves. Moreover, as the senior ABS that the bank retains is typically "more than insignificant," and as power is typically held by the servicer, the bank may need to satisfy several conditions, including relinquishing its servicing rights, or subjecting itself to unilateral removal as servicer without cause, to avoid consolidating the SPE under GAAP. In addition, the yield on the retained senior ABS will generally be lower than the yield on the underlying loans in the securitized portfolio.[73] Thus, the bank's sale of higher-yielding underlying loans and its retention of a lower-yielding senior ABS may negatively impact the bank's net interest margin and net income. Thus, a cash CRT may not compare favorably to the loan sale approach (*i.e.*, the "hacksaw").

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[72] Note that certain transactions require a two-step transfer to legally isolate the assets in bankruptcy.

[73] Note that the yield on the underlying loans must be sufficient to fund interest payments on both the senior ABS and the junior ABS, as well as cover securitization transaction costs, including servicing fees and trustee fees.

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C. Weighing Options: Numerator Strategy vs. Denominator Strategy

Quantitative Considerations

A bank can enhance its regulatory capital position by issuing new capital (the "**Numerator Strategy**") or by reducing its risk-weighted assets through the use of CRTs and other bottom-tray tools (the "**Denominator Strategies**"), or some combination of the two. Each of the Denominator Strategies (loan sales (the hacksaw)), untranched hedge of whole portfolio (the jigsaw), cash CRTs, and synthetic CRTs should all be considered by the bank. We will provide a more detailed example later, but the below provides a very simple comparison of a Numerator Strategy and Denominator Strategy for achieving the goal of raising a bank's capital ratio from 10% to 12%.

Starting Capital Ratio	Numerator Strategy	Denominator Strategy
$\dfrac{\text{Capital}}{\text{RWA}} = \dfrac{\$10}{\$100} = 10\%$	$\dfrac{\text{Capital}}{\text{RWA}} = \dfrac{\$10 + \$2}{\$100} = 12\%$	$\dfrac{\text{Capital}}{\text{RWA}} = \dfrac{\$10}{\$100 - \$16.67} = 12\%$

It will often be the case that synthetic CRTs are the most favorable denominator strategy. Loan sales can be quite unattractive for various reasons, including the loss of future income (to the extent not received as gain on sale) and the potential realization of losses upon sale. Cash CRTs are often unattractive for the same reasons, and also because sale accounting under GAAP may be difficult to achieve. While whole-portfolio hedging avoids these issues, there are few banks that use them, and they are not nearly as efficient as tranched portfolio hedging *via* synthetic CRTs.

In the many cases in which synthetic CRTs are the best Denominator Strategy, the question then becomes: How does the cost of a synthetic CRT compare to the cost of the Numerator Strategy?

To answer this, a bank would first need to calculate the after-tax cost of reaching its target capital ratios using the Numerator Strategy (the "**Numerator Strategy ATX Cost**"). In theory, the bank could calculate the optimal mix of common stock (CET1), perpetual preferred stock (AT1), and long-term subordinated debt (T2) as described earlier in this paper and take that as the cost of the Numerator Strategy. In practice, as noted above, relatively few banks have efficient access to all relevant capital markets such that they can issue as much capital of any given form as they might like.[74] In any event, the Numerator Strategy ATX Cost "is what it is" – it represents the lowest after-tax weighted average cost of regulatory capital for the incremental capital raise that the bank can actually achieve.

A full evaluation of the cost of the synthetic CRT is dependent on many factors, including the type and credit quality of the assets in the reference pool, the size of the junior tranche, and the related current market pricing for credit protection. In evaluating a potential synthetic CRT, it may be useful for the bank to know the breakeven pricing. By "breakeven pricing," we mean the pre-tax price-per-dollar-hedged (the "**Premium**") that the bank must pay to the SPE or other counterparty[75] that would make the total after-tax cost of the given synthetic CRT exactly equal to the bank's Numerator Strategy ATX Cost.

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[74] A bank may, for example, be forced to issue only common stock (CET1) in order to meet its target capital ratios simply because it does not have efficient access to the market for preferred stock (AT1) or long-term subordinated debt (T2).

[75] The Premium is the price the bank must pay to the SPE or the counterparty for credit protection. That, and not the return to investors in the CLNs, is the cost of the credit protection to the bank. The return to CLN investors involves two components: (1) investment earnings (*e.g.*, SOFR or money market or SOFR-based returns) on the amount invested by the CLN investors *plus* (2) a spread. The spread is essentially a passthrough of the Premium, *minus* some deductions. The spread that CLN investors require will directly impact the amount of the Premium that the bank must pay to the SPE.

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As we show in Appendix 3, a provisional breakeven after-tax Premium ($\mathbf{Premium'_{ATX}}$) for any given CRT can be calculated using the following inputs:

(1) **$\mathbf{TCR'}$**, which is the bank's targeted capital ratio under its Numerator Strategy. The targeted total capital ratio can be the CET1 capital ratio, the tier 1 capital ratio or the total capital ratio, depending on the bank's strategic objectives.

(2) **$\mathbf{WACC_R'}$**, which is the bank's weighted average cost of capital for the amount of incremental regulatory capital that it would need to raise to reach $\text{TCR.}'$ WACC_R' varies based on the composition of the incremental capital raised, whether through CET1, AT1, or T2 instruments.[76]

(3) **CRT Configuration**, by which we mean:

   a. The risk weight of the assets in the CRT's reference portfolio ($\mathbf{Asset_{RW}}$).

   b. The size of the junior credit tranche (*i.e.*, the tranche that needs to be hedged) ($\mathbf{J\%}$).

   c. The size of the senior credit tranche (*i.e.*, the tranche that is retained) ($\mathbf{S\%}$).

   d. The resulting SSFA risk weight on the senior (retained) credit tranche ($\mathbf{SSFA_{RW}}$), which is a function of Asset_{RW}, S%, and the portion of the reference portfolio that is seriously delinquent or defaulted.[77]

   e. The risk-weight applicable to the collateral (in the case of a funded CRT) or the counterparty (in the case of an unfunded CRT) ($\mathbf{C_{RW}}$).

$$\mathbf{Premium'_{ATX} = (TCR' * WACC\_R') * \left[\frac{Asset_{RW} - (S\% * SSFA_{RW}) - (J\% * C_{RW})}{J\%} \right]}$$

The Premium that must be paid as described in the CDS documentation will be expressed in pre-tax dollars. Therefore, the provisional breakeven pre-tax Premium would be $\text{Premium}'_{ATX} * \frac{1}{1-t}$, where ***t*** is the bank's marginal tax rate.

We refer to $\text{Premium}'_{ATX}$ as the "provisional" breakeven after-tax Premium because prudent bank management and boards will prepare a detailed financial analysis, including market-based assumptions, balance sheet and income statement models, impact on earnings-per-share, capital ratios and *pro forma* financial results in comparing alternative strategies. This analysis would include, among other things:

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[76] For example: If the objective is to increase the CET1 ratio to 11%, then TCR' equals 11% and $\text{WACC\_R}'$ equals the weighted average cost of capital of the incremental common stock that the bank would need to issue to reach the target CET1 ratio. If the objective is to increase the T1 ratio to 12%, then TCR' equals 12% and $\text{WACC\_R}'$ equals the weighted average cost of capital of the optimal mix of common stock and preferred stock that the bank would need to issue to reach the target T1 ratio. Finally, if the objective is to increase the total capital ratio to 13%, then TCR' equals 13% and $\text{WACC\_R}'$ equals the weighted average cost of capital of the optimal mix of common stock, preferred stock and subordinated debt that the bank would need to issue to reach the target total capital ratio.

[77] *See* Appendix 2 for a detailed discussion of SSFA.

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- Numerator Strategy: The impact of potential earnings from the investment of the proceeds from the new capital issuance.

- Denominator Strategy: The impact of a reduction of risk-weighted assets on the amount of AACL that is included in Tier 2 capital and the amount of AACL that is deducted from risk-weighted assets.[78]

- Numerator Strategy and Denominator Strategy: The impact of the related transaction costs.

Qualitative Considerations

In addition to the quantitative benefits of reducing risk weighted assets (*i.e.*, enhancing Basel III risk-based capital ratios and offering lower after-tax cost that compares favorably to numerator capital options in many cases), CRTs also provide many qualitative benefits relative to common and preferred stock. As mentioned previously, the majority of U.S. banks do not have efficient market access to the capital markets to issue common stock, preferred stock or subordinated debt. Because the pricing for CRTs is tied to the type and quality of the underlying assets, the execution of these transactions is not reliant on research coverage or trading volume of the common or preferred stock or subordinated debt. The contractual maturity of the CRT coverage is tied to the maturity of the reference loans with no regulatory action required for redemption. Common and preferred stock require regulatory approval for redemption. CRTs provide real protection against risk of loss thereby reducing balance sheet risk. While subordinated debt offers tax deductible coupon payments and a stated final maturity, it does not provide protection against loan losses without reduction of equity and requires regulatory approval for redemption.

Banks should note that there are operational requirements for CRTs that differ from those that apply when issuing new capital. These include producing historical performance data on the bank's origination portfolio, delivering periodic reports on the status of the reference portfolio during the life of the CRT, and complying with servicing covenants. As the CRT market in the U.S. is rapidly expanding, more service providers are emerging to assist banks with these operational requirements.

Finally, as we will discuss later in this paper, there are legal and accounting requirements for CRTs that differ from those that apply when issuing new capital. While those requirements need to be considered by the bank in its decision-making process, there are numerous precedent CRT transactions with U.S. banks that provide a roadmap for how to address these requirements.

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[78] As noted previously, the adjusted allowance for credit losses (AACL) is included T2 capital, up to a limit of 1.25% of the bank's risk-weighted assets. Any amount of AACL above that limit is deducted from the bank's risk-weighted assets for capital ratio measurement purposes. Thus, a bank would need to consider the capital ratio effects of any reduction in risk weighted assets on the amount of AACL included in T2 capital (numerator impact) and deducted from risk-weighted assets (denominator impact).

III. CARVING AND CUTTING: THE USER'S MANUAL FOR CRTs

Now that we have surveyed the regulatory capital toolbox, it is time to review the user's manual for CRTs. As with the user's manual for any sharp tool, the one for CRTs begins with a set of warnings:

> ⚠️ Neglecting the specific legal requirements of the capital rules can result in CRT failure and can even lead to a 1,250% risk weight.

The specific legal requirements are: (1) definitional requirements, (2) operational requirements, and (3) due diligence requirements. Each of those requirements will be discussed below. If the definitional or operational requirements are not satisfied, the bank could be required to hold risk-based capital against the underlying exposures as if the CRT never happened. Even if the definitional or operational requirements are satisfied, but the due diligence requirements are not satisfied, the bank could be required to apply a 1,250% risk to its retained senior securitization exposure. **The bank, with the help of its legal advisors, can manage all of these requirements effectively and efficiently.**

> ⚠️ Even if a CRT meets all of the specific legal requirements, the banking regulators can impose a risk weight to a bank's retained securitization exposure that is higher than what is otherwise required under the capital rules.

Under its broad "reservation of authority" powers, if the banking regulator determines that the risk-weight assigned to a bank's exposure is not commensurate with the risks associated with that exposure, then the banking regulator may require the bank to (i) assign a higher risk weight to that exposure or (ii) deduct the amount of that exposure from the bank's regulatory capital.[79] **Many banks have executed CRTs of the type described in this paper. CRTs are not a recent or novel innovation, and their use is directly contemplated by the Capital Rules.**

A.   Definitional Requirements

A synthetic CRT must meet the definition of "synthetic securitization" and a cash CRT must meet the definition of "traditional securitization." The table below sets forth the definitional requirements for synthetic securitizations (applicable to synthetic CRTs) and traditional securitizations (applicable to cash CRTs).

	Definitional Requirements	
	Synthetic Securitization[80] (*applicable to synthetic CRTs*)	**Traditional Securitization**[81] (*applicable to cash CRTs*)
Financial Exposure Requirement	All or substantially all of the underlying exposures are **financial exposures** (such as loans, commitments, credit derivatives, guarantees, receivables, asset-backed securities, mortgage-backed securities, other debt securities, or equity securities).	

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[79] *See* 12 C.F.R. §217.10(d)(3).

[80] *See* 12 C.F.R. §217.2 (definition of "synthetic securitization").

[81] *See* 12 C.F.R. §217.2 (definition of "traditional securitization").

	Definitional Requirements	
	Synthetic Securitization[80] (*applicable to synthetic CRTs*)	**Traditional Securitization**[81] (*applicable to cash CRTs*)
	The term "**financial exposure**" is not defined under the Capital Rules. However, the adopting release for the Capital Rules contains helpful guidance: "Examples of financial exposures include loans, commitments, credit derivatives, guarantees, receivables, asset-backed securities, mortgage-backed securities, other debt securities, or equity securities. Based on their cash flow characteristics, the agencies also consider asset classes such as lease residuals and entertainment royalties to be financial assets. The securitization framework is not designed, however, to apply to tranched credit exposures to commercial or industrial companies or nonfinancial assets or to amounts deducted from capital under section 22 of the final rule. Accordingly, a specialized loan to finance the construction or acquisition of large-scale projects (for example, airports or power plants), objects (for example, ships, aircraft, or satellites), or commodities (for example, reserves, inventories, precious metals, oil, or natural gas) generally would not be a securitization exposure because the assets backing the loan typically are nonfinancial assets (the facility, object, or commodity being financed)."[82]	
Tranching Requirement	The credit risk associated with the underlying exposures has been separated into at least two tranches reflecting different levels of seniority.	
Credit Risk Transfer Requirement	All or a portion of the credit risk of one or more underlying exposures is retained or transferred to one or more third parties *through the use of one or more credit derivatives or guarantees* (other than a guarantee that transfers only the credit risk of an individual retail exposure).	All or a portion of the credit risk of one or more underlying exposures is retained or transferred to one or more third parties *other than through the use of one or more credit derivatives or guarantees*.
	"**Credit derivative**" means a financial contract executed under standard industry credit derivative documentation that allows one party (the protection purchaser) to transfer the credit risk of one or more exposures (reference exposure(s)) to another party (the protection provider) for a certain period of time.[83] "**Guarantee**" means a financial guarantee, letter of credit, insurance, or other similar financial instrument (other than a credit derivative) that allows one party (beneficiary) to transfer the credit risk of one or more specific exposures (reference exposure) to another party (protection provider).[84]	
Performance Depends Requirement	Performance of the securitization exposures depends upon the performance of the underlying exposures.	
Not Owned by Operating Company Requirement	**N/A**	The underlying exposures are not owned by an operating company.
Other Requirements	**N/A**	Other various definitional requirements.[85]

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[82] *See* 78 Fed. Reg. 62018 (Oct. 11, 2013) (the "Basel III Adopting Release"), at 62112.

[83] *See* 12 C.F.R. §217.2 (definition of "credit derivative").

[84] *See* 12 C.F.R. §217.2 (definition of "guarantee").

[85] The other definitional requirements for traditional securitizations are: **(1)** The underlying exposures are not owned by a small business investment company defined in section 302 of the Small Business Investment Act; **(2)** The underlying exposures are not owned by a firm an investment in which qualifies as a community development investment under section 24(Eleventh) of the National

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B. Operational Requirements

In addition to meeting the definitional requirements outlined above, a CRT must meet various operational requirements. The table below sets forth the operational requirements for synthetic securitizations (applicable to synthetic CRTs) and traditional securitizations (applicable to cash CRTs).

	Operational Requirements	
	Synthetic Securitization (*applicable to synthetic CRTs*)	**Traditional Securitization** (*applicable to cash CRTs*)
Credit Risk Mitigant Requirement	The credit risk mitigant is: (i) **financial collateral**; (ii) a guarantee that meets all criteria as set forth in the definition of "**eligible guarantee**", except for the criteria in paragraph (3) of that definition; or (iii) a credit derivative that meets all criteria as set forth in the definition of "**eligible credit derivative**", except for the criteria in paragraph (3) of the definition of "eligible guarantee." Each highlighted term is defined below in the table on pages 42 to 44.	**N/A**
GAAP Derecognition Requirement	**N/A**[86]	The exposures are not reported on the bank's consolidated balance sheet under GAAP.[87]
Risk Transfer Requirement	The bank transfers credit risk associated with the underlying exposures to one or more third parties, and the terms and conditions in the credit risk mitigants employed do not include provisions that:	The bank has transferred to one or more third parties credit risk[88] associated with the underlying exposures.

Bank Act; **(3)** The Board may determine that a transaction in which the underlying exposures are owned by an investment firm that exercises substantially unfettered control over the size and composition of its assets, liabilities, and off-balance sheet exposures is not a traditional securitization based on the transaction's leverage, risk profile, or economic substance; **(4)** The Board may deem a transaction that meets the definition of a traditional securitization, notwithstanding the requirement that the underlying exposures are not owned by an operating company and notwithstanding the requirement in clause (1) above, or clause (2) above, to be a traditional securitization based on the transaction's leverage, risk profile, or economic substance; and **(5)** The transaction is not: **(i)** An investment fund; **(ii)** A collective investment fund (as defined in 12 CFR 208.34); **(iii)** An employee benefit plan (as defined in ERISA), a "governmental plan" (as defined in 29 U.S.C. 1002(32)) that complies with the tax deferral qualification requirements provided in the Internal Revenue Code, or any similar employee benefit plan established under the laws of a foreign jurisdiction; **(iv)** A synthetic exposure to the capital of a financial institution to the extent deducted from capital under §217.22; or **(v)** Registered with the SEC under the Investment Company Act of 1940 or foreign equivalents thereof.

[86] If the bank uses an SPE to issue CLNs, it will need to consider whether it consolidates the SPE. If so, it will account for the CLN. If not, it will account for the CDS with the SPE.

[87] The bank will need to consider whether it consolidates the SPE(s) used in a securitization and otherwise meets the other requirements for derecognition pursuant to ASC 810, *Consolidation*, and ASC 860, *Financial Instruments – Transfers and Servicing*, respectively. Among other things, a transaction will not qualify for sale accounting if the bank consolidates the ultimate transferee. If this no-consolidation requirement is met, and if the other derecognition criteria are satisfied, then the transferred exposures are not reported on the bank's consolidated balance sheet under GAAP.

[88] Note that in a traditional securitization, the bank is generally transferring all risks associated with the underlying exposures (*e.g.*, credit risk, interest rate risk, prepayment risk, etc.).

	Operational Requirements	
	Synthetic Securitization (*applicable to synthetic CRTs*)	**Traditional Securitization** (*applicable to cash CRTs*)
	(i) Allow for the termination of the credit protection due to deterioration in the credit quality of the underlying exposures; (ii) Require the bank to alter or replace the underlying exposures to improve the credit quality of the underlying exposures; (iii) Increase the bank's cost of credit protection in response to deterioration in the credit quality of the underlying exposures; (iv) Increase the yield payable to parties other than the bank in response to a deterioration in the credit quality of the underlying exposures; or (v) Provide for increases in a retained first loss position or credit enhancement provided by the bank after the inception of the securitization.	
Legal Opinion Requirement	The bank obtains a well-reasoned opinion from legal counsel that confirms the enforceability of the credit risk mitigant in all relevant jurisdictions.	**None specified under Regulation Q, but note that a legal opinion is typically necessary in a traditional securitization to assess the "legal isolation" requirement under GAAP.**[89]

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[89] Although the operational requirements for traditional securitizations do not themselves refer to any legal opinion requirement, note that among the derecognition criteria under GAAP is that the transferred assets have been isolated from the transferor. To satisfy this criteria, it is often necessary for the transferor to obtain a "would level" true-sale opinion from legal counsel that the transfer of assets in the securitization isolates the assets from the transferor's creditors even in the event of bankruptcy or receivership (such as FDIC receivership, if the transferor is a bank).

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	Operational Requirements	
	Synthetic Securitization (*applicable to synthetic CRTs*)	**Traditional Securitization** (*applicable to cash CRTs*)
Securitization Doesn't Have Both (1) Underlying Exposures Under Which Borrower May Vary Drawn Amount and (2) an Early Amortization Provision	N/A	The securitization may not have both (1) one or more underlying exposures in which the borrower is permitted to vary the drawn amount within an agreed limit under a line of credit and (2) an **early amortization provision**.[90] "**Early amortization provision**" means a provision in the documentation governing a securitization that, when triggered, causes investors in the securitization exposures to be repaid before the original stated maturity of the securitization exposures, unless the provision: (1) is triggered solely by events not directly related to the performance of the underlying exposures or the originating bank (such as material changes in tax laws or regulations); or (2) leaves investors fully exposed to future draws by borrowers on the underlying exposures even after the provision is triggered.
Eligible Clean-Up Call Requirement	Any clean-up calls relating to the securitization are **eligible clean-up calls**.	
	➢ An "**eligible clean-up call**" means a **clean-up call** that: (1) is exercisable solely at the discretion of the originating bank or servicer; (2) is not structured to avoid allocating losses to securitization exposures held by investors or otherwise structured to provide credit enhancement to the securitization; and (3)(i) for a traditional securitization, is only exercisable when 10 percent or less of the principal amount of the underlying exposures or securitization exposures (determined as of the inception of the securitization) is outstanding; or (ii) for a synthetic securitization, is only exercisable when 10 percent or less of the principal amount of the reference portfolio of underlying exposures (determined as of the inception of the securitization) is outstanding.[91] ➢ A "**clean-up call**" means a contractual provision that permits a bank or servicer to call securitization exposures before their stated maturity or call date.	

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[90] The banking regulators explained that "Many securitizations of revolving credit facilities (for example, credit card receivables) contain provisions that require the securitization to be wound down and investors to be repaid if the excess spread falls below a certain threshold. This decrease in excess spread may, in some cases, be caused by deterioration in the credit quality of the underlying exposures. An early amortization event can increase a banking organization's capital needs if new draws on the revolving credit facilities need to be financed by the banking organization using on-balance sheet sources of funding. The payment allocations used to distribute principal and finance charge collections during the amortization phase of these transactions also can expose a banking organization to a greater risk of loss than in other securitization transactions." *See* the Basel III Adopting Release, at 62115.

[91] Note that in a synthetic securitization, the clean-up call applies only to the CLN or CDS, as the reference portfolio of loans has not been transferred outside the bank.

Importantly, the operational requirements specify that the credit risk mitigant utilized meet certain criteria. Those criteria are defined below.

Term	Definition
Financial Collateral	*See* the *Glossary* for the full definition. For our purposes, the most important definitional components of "financial collateral" are that it is collateral: ➢ In the form of cash on deposit with the bank (including cash held for the bank by a third-party custodian or trustee), money market fund shares, or Treasury securities;[92] and ➢ In which the bank has a perfected, first-priority security interest (with the exception of cash on deposit; and notwithstanding the prior security interest of any custodial agent or any priority security interest granted to a central counterparty[93] in connection with collateral posted to that central counterparty).
Eligible Credit Derivative	*See* the *Glossary* for the full definition. For our purposes, the most important definitional components of an "eligible credit derivative" are that: ➢ It is a **credit derivative**[94] (typically in the form of a credit default swap). ➢ It meets the requirements of an **eligible guarantee** and has been confirmed by the protection purchaser and the protection provider. ➢ It includes the following credit events: • Failure to pay any amount due under the terms of the reference exposure, subject to any applicable minimal payment threshold that is consistent with standard market practice and with a grace period that is closely in line with the grace period of the reference exposure; and • Receivership, insolvency, liquidation, conservatorship or inability of the reference exposure issuer to pay its debts, or its failure or admission in writing of its inability generally to pay its debts as they become due, and similar events. • In addition to failure to pay and bankruptcy, restructuring is typically included as a credit event. Although it is not required in order for a credit derivative to be an "eligible credit derivative," the effective notional amount

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[92] Note that there are other forms of "financial collateral." *See* the *Glossary* for further details.

[93] A "central counterparty" is a counterparty (for example, a clearing house) that facilitates trades between counterparties in one or more financial markets by either guaranteeing trades or novating contracts.

[94] As noted above, "credit derivative" means a financial contract executed under standard industry credit derivative documentation that allows one party (the protection purchaser) to transfer the credit risk of one or more exposures (reference exposure(s)) to another party (the protection provider) for a certain period of time.

Term	Definition
	of an eligible credit derivative that does not cover restructuring is reduced by 40%.[95]
Eligible Guarantee	*See* the *Glossary* for the full definition. For our purposes, the most important definitional components of an "eligible guarantee" are that: ➢ It is a **guarantee**[96] (typically, in the form of a financial guarantee). ➢ It is provided by an **eligible guarantor**. ➢ It is unconditional. ➢ It covers all or a *pro rata* portion of all contractual payments of the obligated party on the reference exposure. ➢ It gives the beneficiary a direct claim against the protection provider. ➢ It is not unilaterally cancelable by the protection provider for reasons other than the breach of the contract by the beneficiary. ➢ It is legally enforceable against the protection provider in a jurisdiction where the protection provider has sufficient assets against which a judgment may be attached and enforced. ➢ It requires the protection provider to make payment to the beneficiary on the occurrence of a default (as defined in the guarantee) of the obligated party on the reference exposure in a timely manner without the beneficiary first having to take legal actions to pursue the obligor for payment. ➢ It does not increase the beneficiary's cost of credit protection on the guarantee in response to deterioration in the credit quality of the reference exposure. ➢ It is not provided by an affiliate of the bank, unless the affiliate is an insured depository institution, foreign bank, securities broker or dealer, or insurance company that: • Does not control the bank; and • Is subject to consolidated supervision and regulation comparable to that imposed on depository institutions, U.S. securities broker-dealers, or U.S. insurance companies (as the case may be).

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[95] *See* 12 C.F.R. §217.36(e). Moreover, the effective notional amount of an eligible guarantee or eligible derivative is subject to reduction if there is a maturity mismatch or a currency mismatch between the guarantee or derivative, as applicable, and the hedged underlying exposures. *See* 12 C.F.R. §217.36(d) (maturity mismatch) and (f) (currency mismatch).

[96] As noted above, "guarantee" means a financial guarantee, letter of credit, insurance, or other similar financial instrument (other than a credit derivative) that allows one party (beneficiary) to transfer the credit risk of one or more specific exposures (reference exposure) to another party (protection provider).

Term	Definition
Eligible Guarantor	An eligible guarantor means: ➤ A sovereign, the Bank for International Settlements, the International Monetary Fund, the European Central Bank, the European Commission, a Federal Home Loan Bank, Federal Agricultural Mortgage Corporation, the European Stability Mechanism, the European Financial Stability Facility, a multilateral development bank. ➤ A depository institution, a bank holding company, a savings and loan holding company, a credit union, a foreign bank, or a qualifying central counterparty. ➤ An entity (other than a special purpose entity): • That at the time the guarantee is issued or anytime thereafter, has issued and outstanding an unsecured debt security without credit enhancement that is investment grade; • Whose creditworthiness is not positively correlated with the credit risk of the exposures for which it has provided guarantees; and • That is not an insurance company engaged predominately in the business of providing credit protection (such as a monoline bond insurer or re-insurer).

C.   Due Diligence Requirements

If a bank is unable to demonstrate to the satisfaction of its banking regulator that it has a comprehensive understanding of the features of a securitization exposure (including a retained senior securitization exposure in a CRT transaction) that would materially affect the performance of the exposure, **the bank must assign the securitization exposure a risk weight of 1,250%**. The bank's analysis must be commensurate with the complexity of the securitization exposure and the materiality of the exposure in relation to its capital.[97]

A bank must demonstrate its comprehensive understanding of a securitization exposure for each securitization exposure by:

1. Conducting an analysis of the risk characteristics of a securitization exposure prior to acquiring the exposure, and documenting such analysis within three business days after acquiring the exposure, considering:

    a) Structural features of the securitization that would materially impact the performance of the exposure, for example, the contractual cash flow waterfall, waterfall-related triggers, credit enhancements, liquidity enhancements, fair value triggers, the performance of organizations that service the exposure, and deal-specific definitions of default;

    b) Relevant information regarding the performance of the underlying credit exposure(s), for example, the percentage of loans 30, 60, and 90 days past due; default rates; prepayment rates; loans in foreclosure; property types; occupancy; average credit score or other

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[97] *See* 12 C.F.R. §217.41(c)(1).

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measures of creditworthiness; average LTV ratio; and industry and geographic diversification data on the underlying exposure(s);

c)   Relevant market data of the securitization, for example, bid-ask spread, most recent sales price and historic price volatility, trading volume, implied market rating, and size, depth and concentration level of the market for the securitization; and

d)   For resecuritization exposures, performance information on the underlying securitization exposures, for example, the issuer name and credit quality, and the characteristics and performance of the exposures underlying the securitization exposures;[98] and

2.   On an on-going basis (no less frequently than quarterly), evaluating, reviewing, and updating as appropriate its analysis of each securitization exposure.[99]

D.   Sizing the Junior and Senior Credit Tranches; SSFA

As explained above, a defining characteristic of CRT transactions is that a reference portfolio is split into a senior credit tranche (which is retained by the bank) and a junior credit tranche (which is hedged). In deciding on how to split the reference portfolio, a key consideration is the risk weight on the retained senior credit tranche, which is treated as a "securitization exposure" under the Capital Rules. For banks using the standardized approach under the Capital Rules,[100] risk weights for securitization exposures, including the retained senior securitization exposures in CRTs, are calculated using the "simplified supervisory formula approach" (SSFA).[101] A detailed explanation of SSFA is provided in *Appendix 2*.

How are the junior and senior tranches sized?

Short answer: Although it is not necessarily the optimal approach in every circumstance, one approach is to create the largest senior securitization exposure (and thus the smallest junior securitization exposure) that is possible without causing the risk weight for the senior exposure to exceed 20%, which is the minimum risk weight for securitization exposures (the securitization risk weight "floor"). The table below shows the size of the senior securitization exposure under this market convention for a range of underlying exposure risk weights.[102]

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[98] *See* 12 C.F.R. §217.41(c)(2)(i).

[99] *See* 12 C.F.R. §217.41(c)(2)(ii).

[100] Any bank that has consolidated total assets of $250 billion or more, or that elects to use the "advanced approaches," is subject to advanced approaches, rather than the standardized approach. *See* 12 C.F.R. §217.100. Under the advanced approaches, a bank would generally use the simplified supervisory formula approach (SSFA) only if it does not qualify for the more elaborate supervisory formula approach ("**SFA**"). *See* 12 C.F.R. §217.142(a)(3). The SFA is beyond the scope of this paper.

[101] *See* 12 C.F.R. §217.43. If the bank is not a market risk banking organization, the bank may use the "gross-up approach instead." Under the gross-up approach, a bank would calculate the "credit equivalent amount," which equals (a) the sum of the exposure amount of the bank's securitization exposure and (b) the *pro rata* share *times* the enhancement amount. To calculate the risk weight for a securitization exposure under the gross up approach, the bank must apply the applicable risk weight to the credit equivalent amount. The gross up approach is beyond the scope of this paper.

[102] The figures below assume that none of the reference portfolio assets are defaulted or seriously delinquent. As explained below, the presence of non-performing assets in the reference portfolio causes the risk weight assigned under SSFA to rise sharply.

Underlying Exposure Risk Weight	Size of Retained Senior Credit Tranche (a senior "securitization exposure")	Size of Junior Credit Tranche (hedged, in synthetic CRT, or sold, in cash CRT)
50%	95%[103]	5%
100%	87.5%[104]	12.5%
150%	78%[105]	22%

Long answer: A key component of SSFA in sizing the junior and senior tranches is a function called K_{SSFA}. K_{SSFA} calculates the capital requirement (and thus 1,250%*K_{SSFA} calculates the risk weight) for a given senior securitization exposure based on only four inputs:[106]

1. A, the attachment point of the securitization exposure.[107]

2. D, the detachment point of the securitization exposure.[108]

3. K_A, which is the performance-adjusted capital requirement of the underlying exposures. $K_A = (1-W)K_G + 0.5W$

   a) K_G is the capital requirement applicable to the underlying exposures.[109]

   b) W is the proportion of the underlying exposures that are defaulted or seriously delinquent, or where the obligor is subject to a bankruptcy proceeding.

4. p, a hardwired "supervisory calibration parameter" colloquially referred to as the "p-factor." $p = 0.5$[110]

The risk weight for a given senior securitization is 1,250% *times* its K_{SSFA} value, where:

$$K_{SSFA} = \frac{e^{a(D-K_A)} - e^{a(A^*-K_A)}}{a(D-A^*)}, \qquad a = -\frac{1}{0.5K_A}$$ [111]

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[103] 95% is a market rounding convention. The maximum size of the senior tranche consistent with a 20% risk weight is 95.4608...%.

[104] 87.5% is a market rounding convention. The maximum size of the senior tranche consistent with a 20% risk weight is 87.8150...%.

[105] 78% is a market rounding convention. The maximum size of the senior tranche consistent with a 20% risk weight is 78.6267...%.

[106] *See* 12 C.F.R. §217.43.

[107] Every securitization exposure has a set of coordinates, in the form of an attachment point and a detachment point, that locates the exposure's position on the axis of seniority, which ranges from 0 (most junior position) to 1 (most senior position). The attachment point (A) is the threshold at which credit losses will first be allocated to that securitization exposure. *See* 217 C.F.R. §43(b)(3).

[108] The detachment point (D) is the threshold at which credit losses allocated to that exposure would result in a total loss *See* 217 C.F.R. §43(b)(4).

[109] For example, (i) residential mortgage loans have a 50% risk weight, which corresponds to a K_G of 4%, (ii) corporate loans have a 100% risk weight, which corresponds to a K_G of 8%, and (iii) high volatility commercial real estate loans have a risk weight of 150%, which corresponds to a K_G of 12%.

[110] For resecuritizations, the p-factor value is 1.5.

[111] The 0.5 in this expression is the p-factor. As explained in Appendix 2, the term $-\frac{1}{pK_A}$ is the rate of exponential decay, which governs how quickly risk weights decrease as seniority increases.

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Because we are interested in the retained *senior* securitization exposure, we know that $D = 1$ in all cases. To find the risk weight for the senior securitization exposure, we plug in the attachment point (A) and solve.

For example, where the underlying exposures are corporate loans, $K_A = 8\%$[112] and the attachment point of the senior securitization exposure is 10%, then the risk weight of the senior securitization exposure is:

$$1{,}250\% * \frac{e^{a(1-0.08)} - e^{a(0.10-0.08)}}{a(1-0.10)}, \quad where\ a = -\frac{1}{0.5*0.08}, \quad equals\ \textbf{33.70\%}.$$

An important point to note about the SSFA formula is that it harshly treats the proportion of the reference pool that consists of delinquent and defaulted underlying exposures (that portion is **parameter W**, as defined above).[113] Once a credit event occurs under the CDS and the requisite credit protection payment is made, the related loan asset is generally removed from the reference portfolio. However, there could be a lag between (1) when that asset is treated as a delinquent or defaulted asset under parameter W and (2) when it is removed from the reference portfolio under the CDS. The table below demonstrates the increase in the risk weight assigned to the retained senior exposure for which we calculated the 33.70% risk weight above.

Parameter W Value	Risk Weight
0%	33.70%
1%	40.82%
2%	48.59%
3%	57.00%
4%	66.02%
5%	75.49%

Finding the "optimal" sizing of the junior and senior tranches is a bit tricky and depends on various factors. A framework for thinking about the question is illustrated by example below.

Suppose a bank has $1,000,000 in prime credit quality auto loans. It wants to put them in a CRT and see how much net RWA reduction it gets and at what price. Below, we look at two options: Option 1 sizes the senior tranche at 87.5% and the junior tranche at 12.5%. Option 2 sizes the senior tranche at 90% and the junior tranche at 10%. We assume that the risk weight on the financial collateral backing the CDS is 20%.

	Option 1	**Option 2**
Notional Amount in Reference Portfolio (amount we are splitting into senior (retained) and junior (hedged))	$1,000,000	$1,000,000
Asset Risk Weight	100%	100%
S%	87.5%	90.0%

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[112] The risk weight for corporate loans is 100%. Assuming that the pool doesn't contain any defaulted or seriously delinquent loans (*i.e.*, W = 0%), then $K_G = 100\% * 8\% = 8\%$, and K_A also equals 8% because $K_A = (1-W)K_G + 0.5W = K_G$, when W = 0.

[113] The harsh treatment is due to the 0.5 scaling factor attached to parameter W in the K_A definition.

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Size of Retained Senior Tranche	$875,000	$900,000
J%	12.5%	10.0%
Size of Junior Tranche	$125,000	$100,000
Risk Weight of the Senior Tranche (SSFA)	20%	33.7%
Risk Weight of the Junior Tranche (Financial Collateral)	20%	20%
Gross RWA Reduction	1,000,000 * 100% = $1,000,000	$1,000,000 * 100% = $1,000,000
RWA of the Senior Tranche	$875,000 * 20% = $175,000	$900,000 * 33.7% = $303,300
RWA of the Junior Tranche	$125,000 * 20% = $25,000	$100,000 * 20% = $20,000
Net RWA Reduction	$1,000,000 - $175,000 - $25,000 = $800,000	$1,000,000 - $303,300 - $20,000 =$676,700
Market Price Quoted for Credit Protection	7.00%	7.25% {somewhat higher pricing because the junior tranche is thinner}
Price of credit protection	$7.00\% * \$125,000$ $= \mathbf{\$8,750}$	$7.25\% * \$100,000$ $= \mathbf{\$7,250}$

Note that Option 1 is $1,500 more expensive than Option 2 ($8,750 - $7,250). On the other hand, Option 1 produces $123,300 more net risk-weighted asset reduction than Option 2 ($800,000 - $676,700). Should the bank pay an extra $1,500 to get an extra $123,300 in risk-weighted asset reduction? That will depend, in part, on the bank's marginal return on capital. Reducing risk-weighted assets by $123,300 will free up a certain amount of capital.[114] If the bank can earn enough on the freed-up capital to justify the incremental $1,500 expense, then Option 1 may be the better choice. If not, then Option 2 may be the better choice. Of course, the bank will want to weigh other considerations in making this choice, such as overall balance sheet, income statement, EPS, and valuation impacts, as well as its credit risk management goals.

If the bank concludes that Option 1 is preferable to Option 2, it could then compare Option 1 to a third option (e.g., S% = 85%, J% = 15%) to see if the marginal benefit of the additional risk-weighted asset reduction under the new option is worth the marginal cost of the additional Premium expense under the new option. In theory, this "champion/challenger" approach could be used to find the optimum configuration for the bank (i.e., where marginal benefit equals marginal cost).

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[114] The amount of capital freed up will depend on various factors, including the amount of AACL that counts as T2 capital.

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IV. MEASURING AND ADJUSTING: GAAP ACCOUNTING CONSIDERATIONS

In the previous section, we presented a user's manual for the various types of CRTs. In this section, we reach for the U.S. GAAP "tape measure" and level to assess the accounting treatment of CRTs.

As previously discussed, a bank may consider an unfunded synthetic securitization in the form of a CDS with an eligible counterparty, and a funded synthetic securitization in the form of either (a) a CDS with an SPE, which issues a CLN, or (b) a CLN issued directly by the bank. Unlike a traditional securitization, which does not provide regulatory capital relief unless it results in de-recognition for accounting purposes,[115] synthetic securitizations do not result in de-recognition of the referenced assets but provide regulatory relief through reductions in risk weights, provided that the definitional, operational, and due diligence requirements are satisfied. For accounting purposes:

- If the bank enters into a CDS with an eligible counterparty or with an SPE that is not consolidated with the bank under GAAP, the bank generally accounts for the CDS as a freestanding derivative instrument providing a third-party credit enhancement. In this circumstance, we refer to the CDS as a "**freestanding CDS**."

- If the bank enters into a CDS with an SPE that is consolidated with the bank under GAAP or the bank issues the CLN directly, the bank generally accounts for the CLN as two instruments (1) a debt instrument (a "debt host" without the credit enhancement-related terms) and (2) embedded derivative instrument providing third-party credit enhancement. In this circumstance, we refer to the embedded credit enhancement as the "**embedded credit enhancement feature of a CLN**."

- Together, we refer to a freestanding CDS and the embedded credit enhancement feature of a CLN as a "**CRT credit enhancement**."

Thus, if a CRT involves an SPE, the bank must first assess whether it consolidates the SPE. In this section, we assume that the bank does not consolidate the SPE because the bank typically does not (i) participate in decisions that significantly impact the SPE's economic performance or (ii) retain more than insignificant exposure to the SPE's economics. However, this requires a careful accounting analysis of these facts to confirm.

Regardless of whether a CRT credit enhancement is a freestanding CDS or an embedded credit enhancement feature of a CLN, the credit enhancement is separate from the referenced instruments (*i.e.*, the loan portfolio) that generate the credit risk. Therefore, the transfer of credit risk to investors does not affect the bank's accounting for expected credit losses under ASC 326, *Financial Instruments – Credit Losses* ("**ASC 326**") because the underlying loans remain on the bank's balance sheet.[116] Use of a CRT

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[115] A traditional securitization involves the transfer of loans to a bankruptcy-remote special purpose entity ("**BRE**"). In a two-step transaction (which is more common in practice), the BRE then transfers the assets to an "Issuer" special purpose entity who issues notes to investors. This two-step process is designed to achieve de-recognition under the criteria of ASC 860, *Financial Instruments – Transfers and Servicing* ("**ASC 860**"). Less commonly, in a one-step securitization, the BRE issues notes directly to investors.

Under ASC 860, a transfer of financial assets, including a securitization, achieves de-recognition if and only if the transfer (a) legally isolates the transferred assets from the creditors of the transferor, even in bankruptcy or other receivership such as FDIC receivership, (b) does not result in the transferor retaining actual control of the transferred assets, and (c) does not result in the transferor maintaining effective control, such as through a call right or repurchase obligation. If the transfer does not meet all three criteria, the transfer is accounted for as a secured borrowing and the assets remain on the balance sheet of the transferor.

[116] Under ASC 326-20, the bank measures the allowance for credit losses for loans or held-to-maturity debt securities equal to its current estimate of expected credit losses each reporting period, with the offset recorded to net income through provision expense. For impaired available-for-sale debt securities, an entity records an allowance for credit losses that reflects the amount of the impairment related to credit losses, limited by the amount that fair value is less than the amortized cost basis.

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credit enhancement does not change the timing, amount or presentation of the recognition of expected credit losses. Thus, the benefits from credit protection provided by a CRT credit enhancement may be recognized later than the corresponding credit losses are recognized in the financial statements.

It is important to note that CRT credit enhancements may create volatility in accounting metrics, including net income, because a CRT credit enhancement may be recognized as a derivative instrument. Derivative instruments are accounted for at fair value through earnings unless they qualify for cash flow hedge accounting or a scope exception which is not common. However, the earnings impacts of the CRT credit enhancement may partially offset the earnings impacts related to the allowance for credit losses. This is because changes in the fair value of the CRT credit enhancement, which are driven in significant part by the expected changes in the credit risk of the reference loan portfolio, move in the opposite direction from changes in credit risk that affect the allowance for credit losses under ASC 326.

In limited circumstances, a CRT credit enhancement may qualify for accounting as a financial guarantee.[117] There are multiple accounting models for freestanding credit enhancements, including financial guarantee instruments, depending on the structure and, in some cases, accounting policy elections. Financial guarantees embedded in debt instruments such as CLNs follow the accounting for borrowings, unless embedded features are required to be recorded as derivatives. As we discuss later, it may be challenging for a typical CRT credit enhancement to qualify for financial guarantee accounting.

Question 1: Does Derivative Accounting Apply?

The first consideration for accounting for a synthetic securitization is whether the CRT credit enhancement is accounted for as a derivative instrument or a financial guarantee.[118] Under ASC 815, Derivatives and Hedging ("**ASC 815**"), a derivative instrument has three main characteristics:

(1)   Underlying and notional amount or payment provision;
(2)   Little or no initial net investment; and
(3)   Net settlement.

A freestanding CDS generally meets the ASC 815 definition of a derivative instrument. The underlying is the occurrence of a credit loss event. The notional is the principal balance of the referenced portfolio. In a freestanding CDS there is often no upfront premium payment or a smaller upfront payment than in a non-derivative instrument with similar credit exposure. Net settlement is through contractual cash settlements upon the occurrence of defined credit loss events or termination.

A typical CLN with embedded credit enhancement features generally does not meet the definition of a derivative in its entirety. However, the credit enhancement provisions are embedded features that generally meet the ASC 815 definition of a derivative.

Whether a freestanding CDS or embedded credit enhancement features of a CLN are accounted for as a derivative depends on whether it qualifies for any scope exceptions within ASC 815. The most common scope exception applicable to a CRT credit enhancement is the exception for financial guarantee contracts. Under ASC 815-10-15-58, a contract qualifies for the financial guarantee scope exception only if it meets a very narrow set of criteria, which requires that (i) payment is made solely to reimburse the guaranteed party for failure of the debtor to satisfy required payments under a non-derivative contract,

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[117] ASC 815, *Derivatives and Hedging*, provides a scope exception for certain financial guarantee contracts that meet the conditions described in par. 815-10-15-58.

[118] As previously noted, (i) if the bank enters into a CDS with an eligible counterparty or with an SPE that is not consolidated with the bank under GAAP, the bank generally accounts for the CDS as a freestanding derivative instrument providing a third-party credit enhancement, and (ii) if the bank enters into a CDS with an SPE that is consolidated with the bank under GAAP, the bank generally accounts for the CLN as a debt instrument with an embedded derivative instrument providing a third-party credit enhancement.

(ii) payment is required only if a borrower is legally past due on a contractual payment, and (iii) the guaranteed party is exposed to the risk of nonpayment at inception of the guarantee and throughout its term.

A CRT credit enhancement may fail one or more of the criteria in 815-10-15-58. Most commonly, the term of a synthetic securitization is less than the maximum term of the loans in the referenced portfolio (*e.g.*, a CRT credit enhancement with a term of 7-10 years referencing a portfolio of 30-year residential mortgage loans). While the term of the CRT credit enhancement may closely correspond to the weighted-average expected life of the underlying loan portfolios, individual loans may have contractual terms that are much longer (*i.e.*, 30 years, in our residential mortgage loan example). While only a small number of underlying loans will both extend beyond the term of the CRT credit enhancement and suffer a contractual payment default, this possibility usually results in the CRT credit enhancement having a clause upon termination that requires a financial settlement based on estimated remaining losses.[119] Because an actual default has not occurred requiring this financial settlement, such a contract would not meet the strict requirements of a financial guarantee under ASC 815. If such a settlement is not required, then it is possible to achieve financial guarantee accounting if all other criteria are met.

Another common example is a provision that requires settlement of the CRT credit enhancement if a borrower declares bankruptcy or a loan is restructured. A bankruptcy declaration itself does not trigger a missed payment, though it can trigger an automatic acceleration that eventually leads to a contractual payment default. Similarly, a restructuring itself does not trigger a missed contractual payment, as it changes the contractual terms altogether. For these reasons, provisions requiring settlement of the CRT credit enhancement upon a bankruptcy or restructuring generally preclude eligibility for the financial guarantee scope exception. However, similar provisions structured to require settlement only when a borrower misses a contractual payment might not preclude financial guarantee accounting.

Although not explicitly stated in ASC 815-10-15-58, in a traditional financial guarantee contract, the guarantor assumes the guaranteed party's right to seek payment from the borrower upon reimbursement of the guaranteed party. Banks will need to carefully compare the terms of the CRT credit enhancement to those of a traditional financial guarantee contract and use judgement in evaluating any differences when evaluating whether the CRT credit enhancement qualifies as a financial guarantee..

Notwithstanding the more common features on a CRT credit enhancement described above, it may be possible to structure a CRT credit enhancement without terms that disqualify the instrument from the financial guarantee scope exception and provide for settlement only upon an actual contractual payment default. Such a structure, assuming all other required criteria are met, would not preclude financial guarantee accounting.

Question 2: *How Are Derivatives Accounted for and Measured?*

If a freestanding CDS does not qualify for an ASC 815 scope exception it is accounted for as a derivative instrument measured at fair value through earnings, unless it qualifies for cash flow hedge accounting.[120] Similarly, if the embedded credit enhancement feature of a CLN does not qualify for an ASC 815 scope exception, it must be evaluated to determine whether it must be recognized separately from the host CLN as a derivative measured at fair value through earnings, which is typically the case. For CLNs[121], an alternative is to elect the fair value option for the entire CLN. In that case a portion of the periodic change

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[119] This feature may also be present where there is no maturity mismatch.

[120] The application of cash flow hedge accounting in accordance with ASC 815 is beyond the scope of this paper.

[121] For the purposes of this discussion, the CLN is assumed to be non-recourse debt. Because the debt is non-recourse, all changes in the fair value of the of the CLN would be recorded in earnings.

in fair value of the CLN would be recognized in interest expense and the remainder as other non-interest income or expense.

The projected loss-adjusted cash flows from each loan in the reference portfolio is a significant driver in the measurement of the fair value of a CDS, inclusive of a CDS embedded in CLN. The projected cash flows are based on expected prepayments, expected default amounts, the expected severity of losses from such defaults, and the timing of recoveries. These can be summarized as four assumptions: (i) prepayment rate, (ii) default rate, (iii) severity, and (iv) recovery lag. Another key assumption that significantly impacts the measurement of the fair value is the discount margin, which is the risk premium in excess of the risk-free interest rate. A CLN that is measured at fair value through earnings in its entirety may be further impacted by changes in interest rates, inclusive of changes in credit spreads.

Although it is difficult to qualify for hedge accounting, a freestanding CDS, an embedded derivative in a CLN that is separately recognized, or a CLN that is measured at fair value through earnings in its entirety does provide some benefits in the income statement. This is because changes in the fair value of the derivative move in the opposite direction from the changes in credit risk that affect the allowance for credit losses, creating a natural "hedging" effect.

A freestanding CDS is initially measured at fair value, which is typically equivalent to the upfront premium paid to the CDS counterparty. When a CDS is embedded in a CLN and separately accounted for, its initial fair value is generally equal to zero at inception. In this case, the "premium" is recognized as part of the interest expense on the debt instrument. Regardless of whether the CDS is freestanding or embedded in the CLN, the overall impact on earnings over the life of the instruments is expected to be similar.

The fair value measurement of the CRT credit enhancement generally will not result in immediate offset of previously recognized expected credit losses under ASC 326. **However, prospective changes in expected credit losses may be partially offset by changes in the fair value of the derivative.** Some of the reasons that changes may not exactly offset include (a) fair value reflects a market participant view while ASC 326 reflects an entity-specific view, and (b) fair value incorporates discounting while the allowance for credit losses under ASC 326 may or may not be discounted, depending on the method chosen to estimate expected credit losses. As previously noted, a CRT credit enhancement is not considered when estimating expected credit losses of the referenced portfolio. Therefore, gains and losses on credit derivatives also should not be included in credit loss expense.

Question 3: *What if Guarantee Accounting Applies?*

As noted above, it is difficult for a CRT credit enhancement to qualify for the financial guarantee scope exception under ASC 815, though it may be possible under certain circumstances. If a freestanding CDS qualifies for guarantee accounting, it could result in a guarantee receivable at inception, provided certain additional criteria are met. This is based in part on comments by the Financial Accounting Standards Board ("FASB") at a March 2020 meeting regarding accounting for freestanding credit enhancement contracts. At this meeting, the FASB did not adopt a formal standard, but acknowledged there are multiple acceptable views, including the following:

(1)   "Mirror image" approach in which the guarantee receivable is based on the expected losses recognized in accordance with ASC 326.
(2)   Incurred loss and recovery method, in which the guarantee receivable is recognized when the incurred loss is probable of occurring and recovery of the insurance receivable is probable.
(3)   Insurance contract claim method in which the guarantee receivable is recognized only after a loss event has occurred, the insured entity has filed a claim for reimbursement and recovery of the guarantee receivable is probable.

By contrast, the guidance on freestanding purchased credit insurance contracts does not apply to financial guarantees embedded in a hybrid financial instrument, such as a CLN. Under ASC 405, Liabilities ("ASC 405"), a liability should not be derecognized until it is extinguished. In a typical CLN, the principal balance is not adjusted for credit events until losses occur.

Question 4: *What About IFRS?*

While the focus of this paper is US GAAP, CRT transactions raise similar accounting considerations for entities who follow International Financial Reporting Standards ("**IFRS**"). We summarize key considerations below.

As with US GAAP, it is necessary to consider whether a freestanding CDS meets the definition of a derivative, and whether a CLN has embedded features requiring separate recognition as derivatives. Specifically, whether a freestanding CDS or embedded credit enhancement features of a CLN are accounted for as a derivative depends on whether they meet the financial guarantee scope exception in IFRS 9. IFRS defines a financial guarantee contract as "a contract that requires an issuer to make specified payments to reimburse a holder for a loss that it incurs because a specified debtor fails to make payments when it is due in accordance with the original or modified terms of a debt instrument."

In practice, like US GAAP, a freestanding CDS transaction generally is accounted for as derivative in its entirety, while a CLN contains embedded derivatives requiring evaluation. Also, like US GAAP, derivatives are measured at fair value through profit and loss. IFRS does not have guidance about how a holder should account for financial guarantees that are not derivatives. In practice, a holder of a financial guarantee contract determines whether the guarantee is an integral element of the guaranteed debt instrument. Only if the guarantee is "integral" is the effect of the credit protection recognized when measuring expected credit losses on the referenced portfolio.

V. FINISHING AND APPLYING: EFFICIENCY BANK'S CAPITAL MANAGEMENT PROJECT

To illustrate our discussion of the regulatory capital toolbox and how CRTs fit in, we'll consider an already well-capitalized hypothetical bank, called "Efficiency Bank." The bank's capital ratios are as follows:

Basel III Capital Ratios	Basel III Standards			Efficiency Bank's Current Capital Ratios
$\text{CET1 Ratio} = \dfrac{\text{CET1}}{\text{RWA}}$	Adequately Capitalized: 4.5%	Well Capitalized: 6.5%	CCB: 7.0%	10.0%
$\text{T1 Ratio} = \dfrac{\text{T1}}{\text{RWA}}$	Adequately Capitalized: 6.0%	Well Capitalized: 8.0%	CCB: 8.5%	11.5%
$\text{TC Ratio} = \dfrac{\text{T2}}{\text{RWA}}$	Adequately Capitalized: 8.0%	Well Capitalized: 10.0%	CCB: 10.5%	13.5%

The bank's management and board have decided to increase Efficiency Bank's CET1 ratio to **11.0%** in order to accomplish one or more of the following strategic objectives:

- Support an expected increase in loan demand within existing markets or sectors.

- Support a planned increase in loan originations in new markets or sectors.

- Reducing the excess regulatory capital held against loan portfolios that have high credit risk weights but low credit risk.

- Facilitate regulatory approval of a potential merger or acquisition with or by another bank.

- Enhance the ability of the bank to respond swiftly to future strategic or competitive opportunities.

- Ensure the bank's resilience during economic cycles or regulatory changes.

To help Efficiency Bank meet its target CET1 ratio, we must first understand its balance sheet and risk-weighted assets. We can then compare various numerator and denominator strategies for achieving the goal.

Below we show (1) Efficiency Bank's current GAAP balance sheet, (2) a conversion table to help us translate the bank's GAAP balance sheet into its regulatory balance sheet, and (3) Efficiency Bank's current regulatory balance sheet.

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Efficiency Bank's Current GAAP Balance Sheet

Assets ($ in thousands)		Liabilities ($ in thousands)	
Cash	$1,500,000	Deposits...	$13,581,275
U.S. Treasuries.............................	$450,000	Long Term Subordinated Debt.........	$103,700
Other Securities	$1,200,000	**Total Liabilities.........................**	**$13,684,975**
		Shareholders' Equity ($ in thousands)	
Residential Mortgage Loans	$3,850,000		
Corporate Loans	$5,400,000		
Commercial Real-Estate Loans	$2,000,000		
Total Loans	**$11,250,000**		
		Perp. Preferred Stock (and Surplus)	$171,525
Allowance for Credit Losses (ACL)[122]	($150,000)	Common Equity (and Surplus).........	$193,500
Other Assets	$750,000	Retained Earnings	$950,000
		AOCI	$0
		Total Shareholders' Equity..........	**$1,315,025**
Total Assets................................	**$15,000,000**	**Total Liabilities and Equity........**	**$15,000,000**

GAAP → Regulatory Conversion Table

Asset Type	Risk Weight	Balance Sheet Item	Regulatory Capital Type
Cash	0%	Common Equity (and Surplus)	CET1
U.S. Treasuries	0%	Retained Earnings	CET1
Other Securities	30%[123]	AOCI	CET1
Residential Mortgage Loans	50%[124]	Perpetual Preferred Stock (and Surplus)	AT1
Corporate Loans	100%	Long-Term Subordinated Debt	T2
Commercial Real-Estate Loans	150%[125]	Allowance for Credit Losses (ACL)*	T2
Allowance for Credit Losses (ACL)	0%		
Other Assets	100%[126]	Deposits	N/A
** Note that only the **adjusted** allowance for credit losses (AACL) is included in T2, up to a cap of 1.25% of RWA. Any amount of AACL in excess of that 1.25% cap is deducted from risk-weighted assets for purposes of calculating a bank's capital ratios. **For purposes of this hypothetical, we assume that AACL is $125,000, which is below the 1.25% cap.***			

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[122] The allowance for credit losses (ACL) is the reserve for expected credit losses under the current expected credit losses methodology (CECL). The adjusted allowance for credit losses (AACL) is the portion of the allowance for credit losses under CECL (ACL) that the Capital Rules permit to be included in tier 2 capital. AACL includes only that portion of ACL that has been charged against earnings or retained earnings.

[123] We assume a weighted average risk weight of 30% for "Other Securities."

[124] We assume that all of Efficiency Bank's residential mortgage loans are qualifying first-lien residential mortgage exposures.

[125] We assume that all of Efficiency Bank's commercial real estate loans are "high-volatility commercial real estate (HVCRE)" exposures.

[126] We assume a weighted average risk weight of 100% for "Other Assets."

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Efficiency Bank's Current Regulatory Balance Sheet

Risk-Weighted Assets ($ in thousands)		Tier 2 Capital ($ in thousands)	
Cash	$0	Long Term Subordinated Debt........................	$103,700
U.S. Treasuries.............................	$0	+ Adjusted Allowance for Credit Losses (AACL)	$125,000[128]
Other Securities	$360,000		
		= Tier 2 Capital	**$228,700**
Residential Mortgage Loans	$1,925,000	**Tier 1 Capital ($ in thousands)**	
Corporate Loans	$5,400,000		
Commercial Real-Estate Loans	$3,000,000		
Total Loans	**$10,325,000**	Perpetual Preferred Stock (and Surplus)	$171,525
Allowance for Credit Losses (ACL)	$0[127]	**= Additional Tier 1 Capital............................**	**$171,525**
Other Assets	$750,000	Common Equity (and Surplus)	$193,500
		+ Retained Earnings	$950,000
		+ AOCI	$0
		= Common Equity Tier 1 Capital	**$1,143,500**
		Tier 1 Capital (= CET1 + AT1)	**$1,315,025**
Total Risk-Weighted Assets.......	**$11,435,000**	**Total Capital (= T1 + T2)................................**	**$1,543,725**

Efficiency Bank's Current Basel III Capital Ratios ($ in thousands)		
CET1 Ratio $$\frac{\text{CET1}}{\text{RWA}}$$	$$\frac{\$1,143,500}{\$11,435,000}$$	$= 10.0\%$
T1 Ratio $$\frac{\text{CET1} + \text{AT1}}{\text{RWA}}$$	$$\frac{\$1,143,500 + \$171,525 = \$1,315,025}{\$11,435,000}$$	$= 11.5\%$
Total Capital Ratio $$\frac{\text{T1} + \text{T2}}{\text{RWA}}$$	$$\frac{\$1,315,025 + \$228,700 = \$1,543,725}{\$11,435,000}$$	$= 13.5\%$

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[127] ACL is not reflected in risk weighted assets. Rather, as noted above, the adjusted allowance for credit losses (AACL) is a component of T2, up to a cap of 1.25% of risk-weighted assets.

[128] Note that the GAAP balance sheet shows ACL in the amount of $150,000,000. We would expect the amount of AACL to be somewhat less than that because, as noted above, AACL includes only that portion of ACL that has been charged against earnings or retained earnings. As noted above, for purposes of this example, we assume that AACL is $125,000.

Numerator Strategy and Denominator Strategy

Recall that Efficiency Bank's goal is to increase its CET1 ratio from 10.0% to 11.00%. Efficiency Bank has both a numerator strategy (increase in capital) and a denominator strategy (decrease in risk-weighted assets) to achieve its goal:

	Numerator Strategy ($ in thousands)	New Ratio	Denominator Strategy ($ in thousands)	New Ratio
CET1 Ratio $\dfrac{\text{CET1}}{\text{RWA}}$	$\dfrac{\$1,143,500 + \$114,350}{\$11,435,000}$	$= 11.0\%$ ✓	$\dfrac{\$1,143,500}{\$11,435,000 - \$1,039,545}$	$= 11.0\%$ ✓
T1 Ratio $\dfrac{\text{CET1} + \text{AT1}}{\text{RWA}}$	$\dfrac{\$1,257,850 + \$171,525}{\$11,435,000}$	$= 12.5\%$	$\dfrac{\$1,143,500 + \$171,525}{\$11,435,000 - \$1,039,545}$	$= 12.7\%$
Total Capital Ratio $\dfrac{\text{T1} + \text{T2}}{\text{RWA}}$	$\dfrac{\$1,429,375 + \$228,700}{\$11,435,000}$	$= 14.5\%$	$\dfrac{\$1,315,025 + \$228,700}{\$11,435,000 - \$1,039,545}$ [129]	$= 14.9\%$

Numerator Strategy: Execution and After-Tax Cost *($ in thousands)*

To execute the Numerator Strategy, Efficiency Bank would issue $114,350 in common stock and no additional noncumulative perpetual preferred stock or long-term subordinated debt. Thus, the total amount of new capital being issued is **$114,350**.[130]

Using our assumed 12%, 9%, and 5.25% values for the after-tax cost of common stock, preferred stock, and subordinated debt, respectively, we can calculate Efficiency Bank's WACC_R for this incremental capital raise:

$$\left(\frac{\$114,350}{\$114,350}\right) * 12\% + \left(\frac{\$0}{\$114,350}\right) * 9\% + \left(\frac{\$0}{\$114,350}\right) * 5.25\% = 12.0\%$$

Thus, the annual after-tax cost of the numerator strategy is $114,350 (the new capital) times **12.0%** (the incremental WACC_R), which equals an annual after-tax cost of **$13,722**.

Denominator Strategy: Execution and After Tax Cost *($ in thousands)*

As an alternative to raising new capital, Efficiency Bank could achieve its capital ratio targets by reducing its risk-weighted assets by **$1,039,545**.

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[129] Note that in this hypothetical, even after the reduction in risk weighted assets, the amount of AACL ($125,000) remains less than 1.25% of risk weighted assets. Thus, no reduction in T2 is necessary to bring the amount of AACL included in T2 under the 1.25% cap amount.

[130] For convenience, we assume that the proceeds of the new capital issuance are held in the form of assets with a 0% risk weight (*e.g.*, cash or U.S. Treasuries).

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In order to reduce its risk-weighted assets by the required amount, Efficiency Bank should compare the annual after-tax cost of each of the bottom-tray tools at its disposal – the hacksaw (loan sale), the jigsaw (untranched hedge of whole portfolio), and the precision cutting tools (CRTs). Once it identifies the bottom tray tool with the lowest annual after-tax cost, it can compare that cost to the $13,722 annual after-tax cost of the numerator-raising tools as described in the previous section and pick the lowest-cost option.

As noted above, it will often be the case that synthetic CRTs are the most favorable denominator strategy. While Efficiency Bank could sell loans off its balance sheet, that approach may come at a substantial cost – *e.g.*, the loss of future income, the potential realization of losses upon sale and the loss of customer relationships. The cash CRT option may be unattractive for the same reasons, and also because GAAP accounting rules make it difficult for Efficiency Bank to act as servicer without being subject to removal without cause. In addition, as noted above, the yield on the retained senior ABS will generally be lower than the yield on the underlying loans in the securitized portfolio. Thus, the bank's sale of higher-yielding underlying loans and its retention of a lower-yielding senior ABS may negatively impact the bank's net interest margin and net income. While whole-portfolio hedging avoids these issues, there are few banks that use them, and they are not as efficient as tranched portfolio hedging *via* synthetic CRTs.

Synthetic CRT Options

The basic algebra of Efficiency Bank's CRT options is straightforward. Because the object is to reduce risk-weighted assets by $1,039,545, the amount of existing risk-weighted assets (*i.e.*, loans) that the bank sheds *via* the CRT *minus* the amount of new risk-weighted assets that the bank takes back in connection with the CRT (*i.e.*, the retained senior securitization exposure and the financial collateral or counterparty exposure, if any) must equal $1,039,545.

Recall that the after-tax Numerator Strategy cost is **$13,722**. Suppose that, as a potential alternative to the Numerator Strategy, Efficiency Bank is considering three options for a funded or unfunded synthetic CRT to achieve the requisite net $1,039,545 reduction in risk-weighted assets. Option 1 involves its first-lien residential mortgage loans (a 50% risk weighted asset), Option 2 involves its corporate loans (a 100% risk-weighted asset), and Option 3 involves its high-volatility commercial real-estate loans (a 150% risk-weighted asset). The table below shows the three options and their related breakeven pricing.

	Synthetic CRT Options ($ in thousands)		
	Option 1: Resi Mortgage Loans	**Option 2: Corporate Loans**	**Option 3: HVCRE**
CRT Configuration			
Asset Risk Weight (**Asset$_{RW}$**)	50.0%	100.0%	150.0%
% Size of Retained Senior Tranche (**S%**)	95.0%	87.5%	78.0%
% Size of Hedged Junior Tranche (**J%**)	5.0%	12.5%	22.0%

	Synthetic CRT Options ($ in thousands)		
	Option 1: **Resi Mortgage Loans**	**Option 2:** **Corporate Loans**	**Option 3:** **HVCRE**
SSFA Risk Weight Assigned to Retained Senior Tranche[131] **(SSFA$_{RW}$)**	20.0%	20.0%	20.0%
Risk Weight of Hedged Junior Tranche[132] **(C$_{RW}$)**	20.0%	20.0%	20.0%
» Weighted Average Risk Weight of CRT[133] «	20.0%	20.0%	20.0%
» Decrease in Risk Weight «	(50.0% - 20.0%) 30.0%	(100.0% - 20.0%) 80.0%	(150.0% - 20.0%) 130.0%
Application of CRT Configuration to Efficiency Bank			
Target RWA Reduction	**$1,039,545**	**$1,039,545**	**$1,039,545**
Notional Amount of CRT Reference Portfolio (*sized to achieve Target RWA Reduction*)	(**$1,039,545** / 30.0%) $3,465,150.00	(**$1,039,545** / 80.0%) $1,299,431.25	(**$1,039,545** / 130.0%) $799,650.00
Notional Size of Retained Senior Tranche	($3,465,150.00 * 95.0%) $3,291,892.50	($1,299,431.25 * 87.5%) $1,137,002.34	($799,650.00 * 78.0%) $623,727.00
Notional Size of Hedged Junior Tranche	($3,465,150* 5.0%) $173,257.50	($1,299,431.25 * 12.5%) $162,428.91	($799,650.00 * 22.0%) $175,923.00

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[131] We assume that none of the loans are defaulted or seriously delinquent. As we explained previously, the presence of nonperforming loans in the reference portfolio would cause the SSFA risk weight to go up.

[132] Recall that C$_{RW}$ is the risk weight applicable to the collateral (in the case of a funded CRT) or the counterparty (in the case of an unfunded CRT). In this case, we assume that (i) if the synthetic CRT is funded, the cash collateral is invested and the 20% risk weight floor under 12 C.F.R. §217.37(b)(2) applies, and (ii) if the synthetic CRT is unfunded, the risk weight of the counterparty is 20% (which would typically be the case for the types of entities that would be eligible guarantors).

[133] The weighted average is: (S% * SSFA$_{RW}$) + (J% * C$_{RW}$).

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	Synthetic CRT Options ($ in thousands)		
	Option 1: **Resi Mortgage Loans**	**Option 2:** **Corporate Loans**	**Option 3:** **HVCRE**
Break-Even Analysis			
Bank's Break-Even After-Tax Per Annum Expense (*i.e., cost of the Numerator Strategy*)	$13,722	$13,722	$13,722
Bank's Break-Even After-Tax Premium[134] (*per annum after-tax cost to hedge the junior tranche, as percent of notional amount hedged*)	7.92% $13,722 / $173,257.50	8.45% $13,722 / $162,428.91	7.80% $13,722 / $175,923.00
Bank's Break-Even Pre-Tax Premium (*per annum pre-tax cost to hedge the junior tranche, assuming a 30% tax rate*)	11.31% 7.92% / (100% - 30%)	12.07% 8.45% / (100% - 30%)	11.14% 7.80% / 100% - 30%

Note that Option 1 (residential mortgage loans) assumes a 95.0%/5.0% senior/junior split, Option 2 (corporate loans) assumes an 87.5%/12.5% senior/junior split, and Option 3 (HVCRE) assumes a 78.0%/22.0% senior/junior split. These splits reflect the common practice of sizing the senior tranche to be as thick as possible consistent with the 20% SSFA risk weight floor. Of course, there are many other senior/junior splits that a bank could consider, ranging from a 99%/1% senior/junior split to a 1%/99% senior/junior split.

Using the $\text{Premium}'_{\text{ATX}}$ formula, we can create a provisional break-even after-tax Premium boundary for Efficiency Bank across the full range of possible senior/junior split percentages.[135] After-tax Premiums below the boundary line would result in a CRT execution that is less costly than the numerator strategy (issuing common stock); after-tax Premiums above the boundary line would result in a CRT execution that is more costly than the numerator strategy.[136]

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[134] As noted earlier in this paper, the after-tax breakeven price for any CRT configuration can be calculated using the related CRT configuration settings (Asset_{RW}, $S\%$, $J\%$, SSFA_{RW}, and C_{RW}), the bank's targeted capital ratio (TCR'), and the bank's after-tax weighted average cost of regulatory capital for the incremental capital raise needed to achieve its target total capital ratio ($\text{WACC\_R}'$). In the case of Efficiency Bank, $\text{TCR}' = \text{CET1 target ratio} = 11\%$ and $\text{WACC\_R}' = 12\%$.

$$\text{Premium}'_{\text{ATX}} = (\text{TCR}' * \text{WACC\_R}') * \left[\frac{\text{Asset}_{\text{RW}} - (S\% * \text{SSFA}_{\text{RW}}) - (J\% * C_{\text{RW}})}{J\%}\right]$$

[135] Note that specifying a particular J% also gives the S% (S% = 100% - J%). The S% can then be plugged into SSFA to calculate the risk weight for the senior (retained) credit tranche. The portion of the reference portfolio that is defaulted or seriously delinquent would also need to be plugged into the SSFA formula. As previously noted, for purposes of the Efficiency Bank example, we assume that all of the loans in the reference portfolio are performing loans.

[136] As noted previously, the breakeven pricing model is provisional. In evaluating the preferred option, Efficiency Bank would also need to consider other factors, including transaction costs.
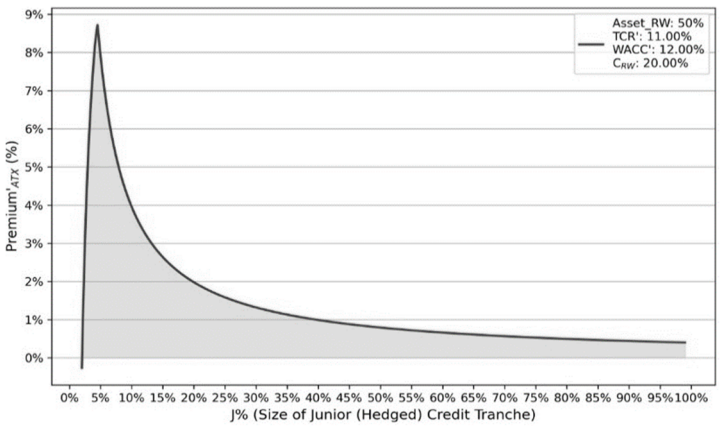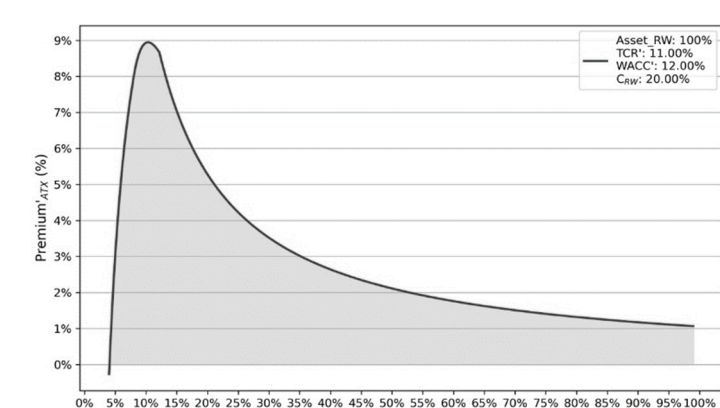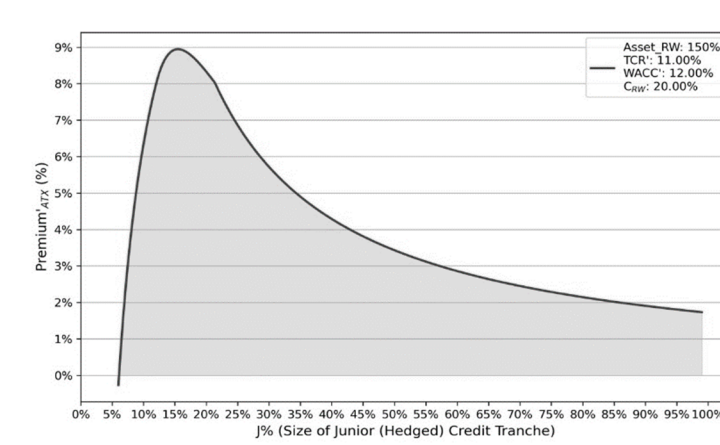
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Below are the provisional $\text{Premium}'_{\text{ATX}}$ boundary lines for each of Efficiency Bank's three loan types.[137] The shaded area depicts the region where the actual after-tax Premium would result in a lower cost to the bank relative to the cost of issuing more common stock.

The shapes of these boundary lines help to illustrate why the region of most interest is junior tranche sizes between 4% and 30%, depending on underlying asset-type. In that range, the breakeven after-tax premium is at or near its peak level, thus offering the greatest opportunity for the market premium to be less than the breakeven premium.

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[137] These boundary lines assume that none of the reference portfolio assets are delinquent or defaulted.

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Efficiency Bank: Provisional Break-Even After-Tax Premium for CRT of <u>Resi Mortgage Loans</u>	Asset_RW: 50% / TCR': 11.00% / WACC': 12.00% / C_{RW}: 20.00%
Efficiency Bank: Provisional Break-Even After-Tax Premium for CRT of <u>Corporate Loans</u>	Asset_RW: 100% / TCR': 11.00% / WACC': 12.00% / C_{RW}: 20.00%
Efficiency Bank: Provisional Break-Even After-Tax Premium for CRT of <u>HVCRE Loans</u>	Asset_RW: 150% / TCR': 11.00% / WACC': 12.00% / C_{RW}: 20.00%
	Recall that $\text{Premium}'_{\text{ATX}} = (\text{TCR}' * \text{WACC\_R}') * \left[\frac{\text{Asset}_{\text{RW}} - (S\% * \text{SSFA}_{\text{RW}}) - (J\% * C_{\text{RW}})}{J\%}\right]$. Thus, the boundary lines shown above would shift up if either TCR' or $\text{WACC\_R}'$ increases, indicating a greater chance that the actual after-tax premium (which is set by the market) will be viable for the bank (*i.e.*, within the shaded area). For example, if Efficiency Bank's $\text{WACC\_R}'$ was 14% rather than 12%, $\text{Premium}'_{\text{ATX}}$ would increase by 16.7%, because 14% is 16.7% greater than 12%.

The common practice of sizing the senior tranche to be as thick as possible consistent with the 20% SSFA risk weight floor is a very good heuristic approach for finding a suitable split, although that practice may not necessarily result in the optimal pricing outcome for the bank. Like the breakeven premium, the market premium will also vary based on the thickness of the junior tranche. Thus, to find the optimal pricing outcome, the bank should consider various junior tranche sizes.

For example, above we calculated that Efficiency Bank could increase its CET1 ratio from 10% to 11% by reducing its risk weighted assets by $1,039,545. We consider two corporate loan CRT options for accomplishing that risk-weighted asset reduction.[138]

	Junior Tranche Thickness (J%)	CRT Risk Weight / Risk Weight Reduction	Notional Size of Reference Pool	Notional Size of Junior Tranche	Breakeven ATX Premium	Hypothetical ATX Market Premium	ATX Cost of CRT
Option 1	12.5%	20.00% / 80.00%	$1,299,431.25	$162,428.91	8.45%	7.00%	$11,370,.02
Option 2	10.0%	32.33%/ 67.67%[139]	$1,536,197.72[140]	$153,619.77	8.93%	7.25%	$11,137.43

Both Option 1 and Option 2 produce the same decrease in risk-weighted assets by $1,039,545 and resulting increase in the CET1 ratio to 11%. Both options are less costly than issuing common stock to achieve that targeted CET1 ratio. As between Option 1 and Option 2, the latter is the lower cost option even though the reference pool size, the premium, and the risk weight on the senior tranche are all higher under Option 2. This is because the notional size of the junior tranche under Option 2 is substantially lower than under Option 1.[141]

The market premium will be impacted by the thickness of the junior tranche, the type of asset selected, the granularity of the assets, and the credit quality of the assets, among other factors. In general, we would expect the lowest pricing on the first-lien residential mortgage loans and the highest pricing on the HVCRE loans, with corporate loans being somewhere in between. Also, in general, with respect to higher risk weight / lower credit quality assets, CRTs can play a role not only in reducing a bank's risk-weighted assets, but also in managing the credit risk of particular types of higher-risk assets.

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[138] The risk weight of the financial collateral is assumed to be 20%.

[139] Note that the SSFA risk weight for a 90.00% senior tranche is 33.70%. Thus, the CRT risk weight is 33.70%*90.00% + 20.00%*10.00% = 32.33%. As the risk weight for corporate loans is 100%, the risk weight reduction is 100.00% - 32.33% = 67.67%.

[140] Recall that the reference pool size is determined by dividing the targeted risk weight reduction amount by the decrease in the risk weight accomplished by the CRT. Thus, $1,039,545 / 67.67% = $1,536,197.72.
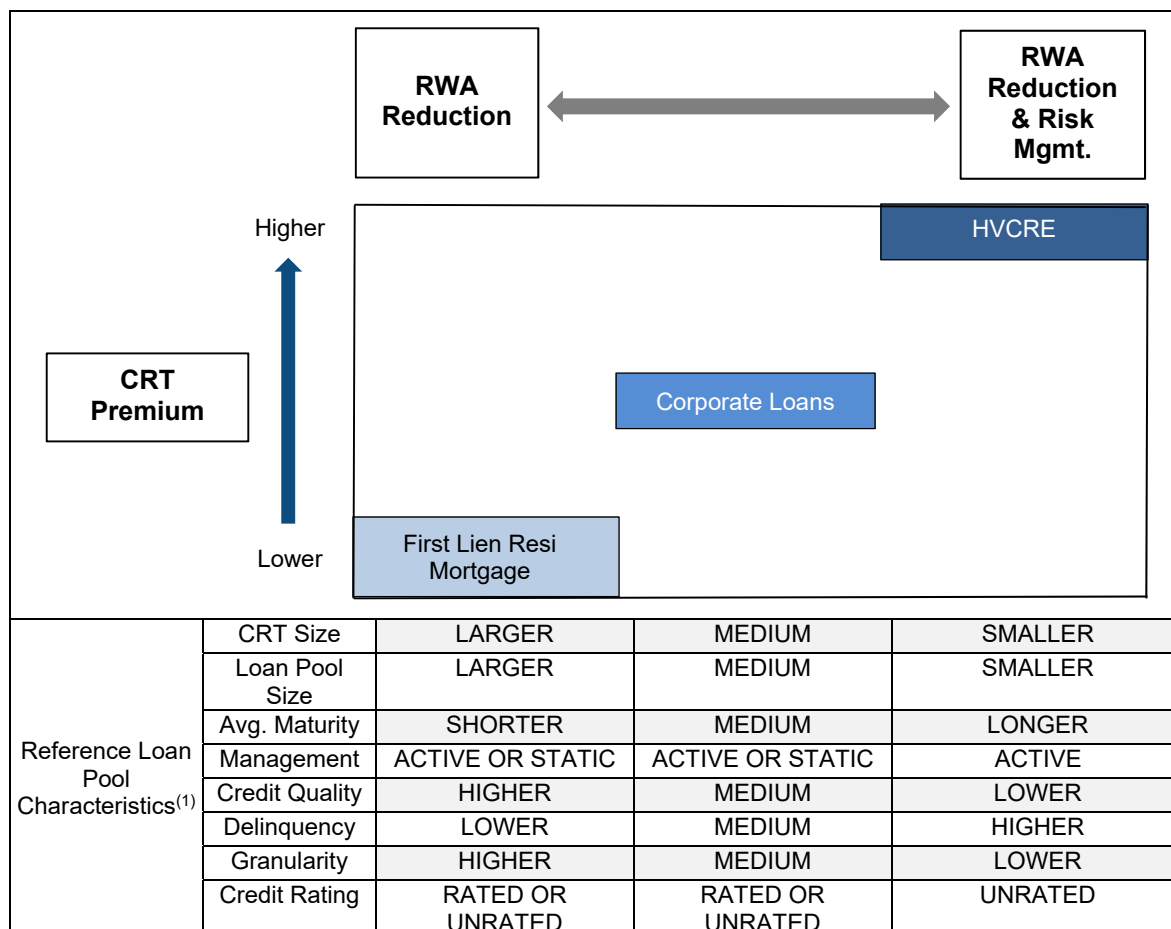
[141] In comparing two junior tranche sizes, J%(Option 1) and J%(Option 2), J%(Option 2) will result in the lower cost if:

$$\frac{\text{Premium (Option 2)}}{\text{Premium (Option 1)}} < \frac{\text{J\%(Option 1)}}{\text{J\%(Option 2)}} * \frac{\text{Risk Weight Reduction (Option 2)}}{\text{Risk Weight Reduction (Option 1)}}.$$ Using our example, we see that $\frac{7.25\%}{7.00\%} < \frac{12.5\%}{10.0\%} * \frac{67.67\%}{80.00\%}$.

The chart below provides a high-level illustration of the relationship between the underlying asset type and the characteristics of the CRT.

Reference Loan Pool Characteristics[1]	CRT Size	LARGER	MEDIUM	SMALLER
	Loan Pool Size	LARGER	MEDIUM	SMALLER
	Avg. Maturity	SHORTER	MEDIUM	LONGER
	Management	ACTIVE OR STATIC	ACTIVE OR STATIC	ACTIVE
	Credit Quality	HIGHER	MEDIUM	LOWER
	Delinquency	LOWER	MEDIUM	HIGHER
	Granularity	HIGHER	MEDIUM	LOWER
	Credit Rating	RATED OR UNRATED	RATED OR UNRATED	UNRATED

(1)   *Note that the reference loan pool characteristics are qualitative assessments and subject to change based on market conditions.*

Finally, we note that Efficiency Bank could use both a numerator strategy and a denominator strategy to reach its CET1 capital objective. Such an approach might be useful if, for example, Efficiency Bank is not able to issue common stock in the amount necessary to increase its CET1 ratio to the desired level. A blended approach might also be useful if Efficiency Bank doesn't have a sufficient amount of loan assets that meet required eligibility or credit standards for inclusion in a CRT. The bank's cost for a blended approach would simply be the weighted average of the cost of the numerator component (issuing new capital) and the denominator component (RWA reduction *via* a CRT).

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VI. FILING AND SANDING: LEGAL CONSIDERATIONS

Earlier in this paper, we presented the user's manual for CRTs, which included a discussion of the applicable legal requirements under the Capital Rules. There are also some legal requirements under other regulatory rules that need to be considered and solved for. **In general, each of these other legal requirements has a solution and will not impose an impediment to executing a CRT transaction.**[142]

A full discussion of the other legal requirements is beyond the scope of this paper. The table below provides a very brief overview.

Legal Requirement	**Description**
Risk Retention	The U.S. Risk Retention Rules (Regulation RR) generally require that a sponsor of a securitization transaction retain at least five percent (5%) of the credit risk of the securitized assets. → **CLNs issued by SPEs should typically not be subject to Regulation RR, although some analysis is required to confirm.** → **CLNs issued directly by banks are not subject to Regulation RR.** → **SPE-Issued ABS in connection with cash CRTs generally are subject to Regulation RR.**[143] Note that CLNs issued by SPEs may be subject to the risk retention rules of other jurisdictions (*e.g.*, Europe). → **Solution: Structure the CLNs to comply with applicable risk retention rules or avoid issuing CLNs in those other jurisdictions.**
Volcker Rule	The Volcker Rule contains three prohibitions that are potentially relevant to SPE-issued CLNs. (1) Prohibits any "banking entity" from "sponsoring" a "covered fund." In general, an SPE that issues a CLN would be a covered fund. → **Solution: Structure the SPE to avoid the bank's being considered the sponsor.** (2) Prohibits any banking entity from acquiring or retaining an "ownership interest" in a covered fund, subject to certain exceptions. → **Solution: Structure the SPE to avoid the bank's taking an ownership interest or to qualify for an exception.** (3) Prohibits any banking entity (i) that serves, directly or indirectly, as the investment manager, investment adviser, commodity trading advisor, or sponsor to a covered fund, or (ii) that "organizes and offers" a covered fund, and no affiliate of any of the foregoing, from entering into certain transactions with the covered fund, referred to as "Super 23A" transactions. → **Solution: Although the bank will have a Super 23A transaction with the SPE (*i.e.*, the CDS), it doesn't violate the prohibition described above because it won't be engaged in the activity described in clause (i) or (ii) above.**
Insurance Regulation	If a guarantee or swap used in a CRT is characterized as "insurance" or "financial guaranty insurance" under state insurance laws, the SPE could be deemed to be engaged in the unauthorized business of selling insurance. → **Solution: Avoid using a guarantee in the CRT. If a guarantee is used, structure it to avoid characterization as an insurance contract. Although a CDS could also be considered an insurance contract under certain circumstances, it is**

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[142] The legal issues applicable to a particular CRT and a particular bank, as well as the method for solving those issues are, in many cases, facts and circumstances determinations and must be evaluated by legal counsel on a case-by-case basis.

[143] Note that the form of risk retention may affect the consolidation assessment under GAAP. Horizontal risk retention is always deemed to be "more than insignificant." L-shaped risk retention may be deemed "more than insignificant" as well. Vertical risk retention is generally not considered "more than insignificant."

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Legal Requirement	Description
	generally easier to structure a CDS (*i.e.*, as opposed to a guarantee) to avoid that characterization, given that the Dodd-Frank Act preempts states from regulating swaps as insurance contracts.
Swap Regulation	The CDSs used in most SPE-issued CLN transactions would be characterized as CFTC-regulated "swaps" or SEC-regulated "security-based swaps" and would therefore be subject to various requirements, including: (i) the potential obligation of the bank to collect and post initial and variation margin, (ii) the need to satisfy the trade reporting requirements of the CFTC or SEC and (iii) the need to satisfy the recordkeeping requirements imposed by the CFTC, the SEC, or, in the case of larger banks, the banking regulators. Moreover, even if a guarantee (rather than a CDS) is used, analysis is required to determine that it is not a "swap" for regulatory purposes. → **Solution: The requirement to collect and post initial and variation margin is applicable only if the bank is a registered swap dealer or security-based swap dealer. Thus, many (if not most) regional banks will <u>not</u> be required to collect or post initial or variation margin. In addition, the requirement of the bank to post and collect initial margin applies only if the counterparty is a "financial end user with material swap exposure" or is itself a regulated swap entity. The initial margin rules are unlikely to apply if the bank's counterparty is an SPE. Note that even if initial or variation margin requirements are applicable, the collateral posted by the SPE at the inception of the transaction would typically satisfy the SPE's (*i.e.*, the bank counterparty's) margin obligations.** The notional CDS used in bank direct-issued CLN transactions (often referred to as an "embedded" CDS or "hypothetical" CDS) is generally thought to be neither a CFTC-regulated swap nor an SEC-regulated security-based swap. The CLN itself (regardless of whether the issuer is an SPE or a bank) is not a "swap" because it falls within the exclusion from "swap" status for "any note, bond or evidence of indebtedness that is a security" or is considered to be a "hybrid instrument" for CFTC purposes. Thus, the CLN itself is neither a CFTC-regulated swap nor an SEC-regulated security-based swap.
Commodity Pool Operator Regulations	A "commodity pool" is a pooled investment vehicle that enters into "commodity interests," which includes a swap. Thus, if an SPE (which is a pooled investment vehicle because it has more than one investor) enters into a swap, then the SPE would be a commodity pool absent an exemption. Absent an exemption, the operator of the SPE would be required to register as a commodity pool operator ("**CPO**") and "commodity trading advisor" ("**CTA**"). → **Solution: (1) Obtain a no-action letter from the CFTC on similar terms to that previously granted to Fannie Mae and Freddie Mac, (2) consider whether it would be reasonable to rely on the *de minimis* size exemption under CFTC Rule 4.13(a)(3), (3) conduct an offshore offering of the CLNs in reliance on the so-called "Super Reg. S" exemption, or (4) register as a CPO/CTA under the "registration lite" regime described in CFTC Rule 4.7.** In addition, if the swap is an SEC-regulated security-based swap, and not a CFTC-regulated swap, then the operator of the SPE would <u>not</u> be required to register as a CPO or a CTA. This distinction turns, in part, on whether the reference assets are (a) consumer assets, in which case the swap is likely to be a CFTC-regulated swap, thus raising the CPO and CTA concern, or (b) non-consumer assets, in which case the swap is likely to be an SEC-regulated security-based swap, in which case there would be no CPO or CTA concern. Swaps relating to baskets of consumer assets are very likely to be CFTC-regulated because the underlying obligors (*e.g.*, borrowers on residential mortgages) will not have been issuers of

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Legal Requirement	Description
	securities. By contrast, swaps involving a basket comprised of obligors that have issued securities (even equity to a parent company) will likely be security-based <u>if</u> the basket is very small <u>or</u> one or both of the counterparties can make discretionary changes to the basket.
Bank Holding Company Act (BHCA) / Regulation W	Under the BHCA, it is important that the SPE not be characterized as being controlled by the bank or one of its affiliates. → **Solution: Structure the SPE either to avoid control by the bank or one of its affiliates.** Under Regulation W, it is important that the SPE not be characterized as a nonbank affiliate of the bank for purposes of Sections 23A and 23B. → **Solution: Structure the SPE to avoid characterization as a nonbank affiliate of the bank. This would require that affiliates of the bank do not control the SPE under either the BHCA "control" standards or under the slightly more stringent standards of Regulation W.**
Rule 192 – Conflicts of Interest	Under Rule 192, a securitization participant with respect to an asset-backed security may not directly or indirectly engage in any conflicted transaction with respect to that asset-backed security. Rule 192 provides exceptions, including for risk-mitigating hedging activities. Rule 192 applies to ABS issuances on and after June 9, 2025, but it has some potential look-back elements. Rule 192 applies to CLNs issued by SPEs. → **Solution: Satisfy the requirements for the risk-mitigating hedging activities exception, including putting a compliance policy in place.** The impact of Rule 192 on other types of CRTs will depend on whether any of the reference portfolio assets are included in a separate ABS transaction. → **Solution: (1) Do not include any CRT reference portfolio assets in a separate ABS or (2) satisfy the requirements for the risk-mitigating hedging activities exception.**

VII. BUFFING AND POLISHING: CONCLUSION

The use of CRTs for capital optimization and credit risk management is not new. CRTs have been used by European banks and U.S. non-bank Agencies for many years. The current market environment and regulatory guidance have heightened bank and investor interest, leading to a recent increase in issuance. The legal and accounting complexities associated with CRTs have been successfully managed and solutions will vary based on the type of CRT transaction. In addition:

- CRTs provide significant flexibility in capital and credit risk management with the ability to tailor coverage corresponding to the maturity of the underlying loans.

- CRTs absorb credit losses, thereby providing an important credit risk management tool that can reduce risk of loss and loan concentration.

- The use of CRTs by U.S. banks is growing with more regional and community banks expected to use them as the product becomes better understood over time.

- Unlike dividend payments on common stock and preferred stock, premiums paid by the bank to the credit protection provider under a CRT may be tax deductible, depending on the bank's particular circumstances.

- Market development for regional and community banks may take time; the pooled trust preferred stock (TPS) market took almost six years to develop from the first approval of TPS as a form of tier 1 capital in 1996 to the greater use in pooled TPS in 2001 and 2002.

While it's clear that CRTs can play an important role in capital and risk management for U.S. banks, banks will use them only if they know how and when to use them, and whether their cost compares favorably to the cost of issuing common stock, preferred stock, or subordinated debt. As such, it may take time for the market to fully develop. Since the large majority of U.S. banks do not have efficient access to capital markets for common stock, preferred stock, and long-term subordinated debt, it is reasonable to expect that such banks will utilize this important tool to enhance their capital and risk management. There are a number of factors that could facilitate the adoption of CRTs, including:

- Further education of banks and other market participants on the comparison of numerator and denominator options, along with the costs and benefits of each option, including CRTs;

- The development of an even broader and deeper investor pool for U.S. bank risk;

- To the extent possible, standardizing and streamlining deal documentation; and

- Developing the market for smaller CRT transactions to provide for efficient execution for community and regional banks.

To recap:

✓ Using the toolbox metaphor, this handbook provides detailed guidance for banking institutions considering strategies to meet capital and risk management objectives.

- o We identify the upper-tray tools in the toolbox, including common stock, preferred stock, and subordinated debt, as sources of capital, which is the numerator of the Basel III capital ratios.

- o We identify the lower-tray tools in the toolbox, including whole portfolio sales, untranched hedge of whole portfolio loans, and credit risk transfers (either synthetic or cash), as means of reducing risk-weighted assets, which is the denominator of the Basel III capital ratios.

✓ We address the recurring questions that we identified in the Executive Overview.

- o **Who should consider using a CRT transaction for capital, risk management and other strategic purposes?**

  We identify the various use cases for CRTs, including:

  - Capital Management

    - Supporting an expected increase in loan demand within new or existing markets or sectors.

    - Alleviating the excess regulatory capital burden associated with loan portfolios that are assigned high credit risk weights but exhibit low actual credit risk.

    - Providing the flexibility to bolster capital ratios to meet or exceed peer group levels without diluting existing ownership.

    - Facilitating regulatory approval of a potential merger or acquisition with or by another bank.

  - Credit Risk Management and Other Strategic Objectives

    - De-risking existing loans on the balance sheet for a period consistent with the remaining life of the loans.

    - Avoiding selling loans with below market yields that cannot be sold without a loss.

    - Ensuring the bank's resilience during economic cycles or regulatory changes.

    - Enhancing the ability of the bank to respond swiftly to future strategic or competitive opportunities.

- o **What are the different types of CRTs, and how do you select the most appropriate type for your bank?**

  We review the four types of CRTs: (1) synthetic CRT (unfunded) – CDS with eligible counterparty, (2) synthetic CRT (funded) – SPE-issued CLNs, (3) synthetic CRT (funded)

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– bank directly-issued CLNs, and (4) cash CRT – SPE-issued ABS and highlight their respective regulatory, accounting, and commercial differences.

- ○ **What are the five key inputs in the configuration of a CRT?**

  We identify (1) the risk weight of the assets in the CRT's reference portfolio, (2) the size of the junior credit tranche, (3) the size of the senior credit tranche, (4) the resulting SSFA risk weight on the senior credit tranche, and (5) the risk-weight applicable to the collateral or counterparty as the five key inputs and explain how those are used to calculate risk weights for securitization exposures under SSFA.

- ○ **How do you size the senior and junior tranches, and how does the SSFA model fit in?**

  - We explain that a common convention is to set the senior tranche to be as thick as possible (and for the junior tranche to be as thin as possible) consistent with the SSFA's 20% risk weight floor on the senior tranche.

  - We point out tweaks that banks can consider in further optimizing the split, such as applying a marginal cost/marginal benefit analysis.

- ○ **What are the key legal and accounting issues when considering a CRT strategy?**

  - We summarize the specific legal and operational requirements under the Capital Rules for CRTs and discuss how those requirements are typically addressed.

  - We discuss elements of the three key accounting standards (ASC 860 (Financial Instruments – Transfers and Servicing), ASC 326 (Financial Instruments – Credit Losses), and ASC 815 (Derivatives and Hedging)) applicable to CRTs and the implications for accounting disclosure of these transactions.

- ✓ We discuss how CRTs are priced and present a simple breakeven pricing model to help banks evaluate CRT costs against alternative options. The model incorporates both the CRT's configuration and the bank's weighted average cost of regulatory capital to compare the CRT's cost with the cost of traditional capital instruments such as common stock, preferred stock, or subordinated debt.

We encourage all banking institutions subject to the Basel III capital rules to use this handbook to better understand the potential cost and benefits of using a CRT strategy for capital and risk management. As noted earlier in this paper, the FDIC Manual's guidance on sound capital planning highlights why it is so important for a bank to have access to a full set of capital management tools. Without such access, a bank with a capital plan is like a builder with a detailed blueprint but only a hammer and hacksaw to build with.

Discuss these strategies with your management team, Board and regulators and consider a proof of concept transaction to establish the platform at your bank for future issuance. You can never have too many tools in the toolbox!

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VIII. GLOSSARY

- "**Banking regulators**" means Office of the Comptroller of the Currency (the "**OCC**"); the Board of Governors of the Federal Reserve System (the "**Federal Reserve Board**"); and the Federal Deposit Insurance Corporation ("**FDIC**").

- "**Capital Rules**" means the rules establishing minimum capital requirements and overall capital adequacy standards for US banks are set forth in 12 CFR §217.1 *et seq*. (for banks regulated by the Federal Reserve Board), 12 CFR §3.1 *et seq*. (for banks regulated by the OCC), and 12 CFR §324.1 *et seq*. (for banks regulated by the FDIC). The rules are identical in all relevant respects.

- "**Credit derivative**" means a financial contract executed under standard industry credit derivative documentation that allows one party (the protection purchaser) to transfer the credit risk of one or more exposures (reference exposure(s)) to another party (the protection provider) for a certain period of time.

- "**Credit risk mitigant**" means collateral (including financial collateral), a credit derivative, or a guarantee.

- "**Eligible credit derivative**" means a credit derivative in the form of a credit default swap, nth-to-default swap, total return swap, or any other form of credit derivative approved by the banking regulator, provided that:

  1. The contract meets the requirements of an eligible guarantee;

  2. Any assignment of the contract has been confirmed by all relevant parties;

  3. If the credit derivative is a credit default swap or n^{th}-to-default swap, the contract includes the following credit events:

     (i) Failure to pay any amount due under the terms of the reference exposure, subject to any applicable minimal payment threshold that is consistent with standard market practice and with a grace period that is closely in line with the grace period of the reference exposure; and

     (ii) Receivership, insolvency, liquidation, conservatorship or inability of the reference exposure issuer to pay its debts, or its failure or admission in writing of its inability generally to pay its debts as they become due, and similar events;

  4. The terms and conditions dictating the manner in which the contract is to be settled are incorporated into the contract;

  5. If the contract allows for cash settlement, the contract incorporates a robust valuation process to estimate loss reliably and specifies a reasonable period for obtaining post-credit event valuations of the reference exposure;

  6. If the contract requires the protection purchaser to transfer an exposure to the protection provider at settlement, the terms of at least one of the exposures that is permitted to be

transferred under the contract provide that any required consent to transfer may not be unreasonably withheld;

7. If the credit derivative is a credit default swap or nth -to-default swap, the contract clearly identifies the parties responsible for determining whether a credit event has occurred, specifies that this determination is not the sole responsibility of the protection provider, and gives the protection purchaser the right to notify the protection provider of the occurrence of a credit event; and

8. If the credit derivative is a total return swap and the bank records net payments received on the swap as net income, the bank records offsetting deterioration in the value of the hedged exposure (either through reductions in fair value or by an addition to reserves).

- "**Eligible guarantee**" means a guarantee that:

1. is written;

2. is either:

    (i) unconditional, or

    (ii) a contingent obligation of the U.S. government or its agencies, the enforceability of which is dependent upon some affirmative action on the part of the beneficiary of the guarantee or a third party (for example, meeting servicing requirements);

3. covers all or a *pro rata* portion of all contractual payments of the obligated party on the reference exposure;

4. gives the beneficiary a direct claim against the protection provider;

5. is not unilaterally cancelable by the protection provider for reasons other than the breach of the contract by the beneficiary;

6. except for a guarantee by a sovereign, is legally enforceable against the protection provider in a jurisdiction where the protection provider has sufficient assets against which a judgment may be attached and enforced;

7. requires the protection provider to make payment to the beneficiary on the occurrence of a default (as defined in the guarantee) of the obligated party on the reference exposure in a timely manner without the beneficiary first having to take legal actions to pursue the obligor for payment;

8. does not increase the beneficiary's cost of credit protection on the guarantee in response to deterioration in the credit quality of the reference exposure;

9. is not provided by an affiliate of the bank, unless the affiliate is an insured depository institution, foreign bank, securities broker or dealer, or insurance company that:

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(i)   does not control the bank; and

(ii) is subject to consolidated supervision and regulation comparable to that imposed on depository institutions, U.S. securities broker-dealers, or U.S. insurance companies (as the case may be); and

10. is provided by an eligible guarantor.

▪ "**Eligible guarantor**" means (1) a sovereign, the bank for International Settlements, the International Monetary Fund, the European Central Bank, the European Commission, a Federal Home Loan Bank, Federal Agricultural Mortgage Corporation (Farmer Mac), the European Stability Mechanism, the European Financial Stability Facility, a multilateral development bank (MDB), a depository institution, a bank holding company, a savings and loan holding company, a credit union, a foreign bank, or a qualifying central counterparty; or (2) an entity (other than a special purpose entity):

1. that at the time the guarantee is issued or anytime thereafter, has issued and outstanding an unsecured debt security without credit enhancement that is investment grade;

2. whose creditworthiness is not positively correlated with the credit risk of the exposures for which it has provided guarantees; and

3. that is not an insurance company engaged predominately in the business of providing credit protection (such as a monoline bond insurer or re-insurer).

▪ "**Financial collateral**" means collateral:

1. In the form of: (i) cash on deposit with the bank (including cash held for the bank by a third-party custodian or trustee); (ii) gold bullion; (iii) long-term debt securities that are not resecuritization exposures and that are investment grade; (iv) short-term debt instruments that are not resecuritization exposures and that are investment grade; (v) equity securities that are publicly traded; (vi) convertible bonds that are publicly traded; or (vii) money market fund shares and other mutual fund shares if a price for the shares is publicly quoted daily; and

2. in which the bank has a perfected, first-priority security interest or, outside of the United States, the legal equivalent thereof (with the exception of cash on deposit; and notwithstanding the prior security interest of any custodial agent or any priority security interest granted to a central counterparty[144] in connection with collateral posted to that central counterparty).

▪ "**GAAP**" means generally accepted accounting principles as used in the United States.

▪ "**Guarantee**" means a financial guarantee, letter of credit, insurance, or other similar financial instrument (other than a credit derivative) that allows one party (beneficiary) to transfer the

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[144] A "central counterparty" is a counterparty (for example, a clearing house) that facilitates trades between counterparties in one or more financial markets by either guaranteeing trades or novating contracts.

credit risk of one or more specific exposures (reference exposure) to another party (protection provider).

- "**High volatility commercial real estate (HVCRE) exposure**" means, subject to certain exclusions, a credit facility secured by land or improved real property that:

  1. Primarily finances, has financed, or refinances the acquisition, development, or construction of real property;

  2. Has the purpose of providing financing to acquire, develop, or improve such real property into income-producing real property; and

  3. Is dependent upon future income or sales proceeds from, or refinancing of, such real property for the repayment of such credit facility.

- "**Resecuritization**" means a securitization which has more than one underlying exposure and in which one or more of the underlying exposures is a securitization exposure.

- "**Securitization exposure**" means:

  1. An on-balance sheet or off-balance sheet credit exposure (including credit-enhancing representations and warranties) that arises from a traditional securitization or synthetic securitization (including a resecuritization), or

  2. An exposure that directly or indirectly references a securitization exposure described in paragraph (1) of this definition.

IX. FREQUENTLY ASKED QUESTIONS

- **How will the cost of a CRT compare to directly issuing tier 1 capital given the current market conditions?**

  For most regional and community banks that are not rated investment grade, investors will typically require a preferred stock dividend of 8% to 10%, which is not tax deductible. Since risk reduction payments may be tax deductible, the after-tax cost of a CRT transaction will generally be less than the cost of a similar amount of preferred.

  For publicly traded regional or community banks, the EPS dilution from issuing common stock is a function of the multiples of price to earnings or price to book value at which the common stock currently trades. The lower the multiples of book value or earnings at which the public bank can issue stock, the more attractive the risk reduction transaction will be relative to a common stock offering. Private and sub-S banks, or mutual savings institutions, or other institutions without direct or efficient access to tier 1 capital will likely find the CRT transaction is much more cost-effective than issuing common stock or preferred stock.

- **Will first loss protection against a high risk weighted loan portfolio enable U.S. banks to materially reduce losses in the severely adverse stress test scenario?**

  Yes. Banks are allowed to include the impact of interest rate hedges and credit loss protection in their stress test analysis. Under the severely adverse case stress test, banks are expected to maintain a common equity tier 1 capital ratio of at least 5%. A risk reduction transaction can provide protection against credit losses suffered under worst case stress-test scenarios, thereby reducing the amount of excess common equity that a bank might otherwise have to maintain.

- **How will a CRT transaction avoid characterization as a "high cost credit protection" transaction?**

  The BIS has expressed concerns about the use of high cost credit protection without significant risk transfer. This concern appears to be focused on transactions where the present value of the premium payments on the risk reduction transaction significantly exceeds the present value of expected losses on the portfolio of referenced assets. We do not think this concern would apply to CRT transactions conducted by regional and community banks, as the sizing of the junior (*i.e.*, first loss) credit tranche, and the related credit protection premium, would be based in part on the expected lifetime loss for the referenced loan portfolio with credit protection payments and related CLN write-downs based on realized losses. The premiums paid for the first loss protection will be based on required market returns for comparable risk transactions, thereby ensuring that the cost of credit protection is commensurate with the expected credit loss. Moreover, banks will compare the cost of a CRT transaction to the cost of new capital issuance, thus providing an additional check on the cost of credit protection afforded by CRTs. There will be no rebate mechanism for premiums.

- **Can banks use a CRT transaction to reduce loan type concentration in certain types of loans?**

  Yes, we think this should be the case. A CRT transaction changes the nature of the bank's credit risk exposure – the bank's exposure to the underlying mortgage loans, auto loans, commercial real-estate loans, etc., is replaced with a senior securitization exposure, with respect to the senior tranche (and also, in the case of a synthetic CRT, a credit exposure to the financial collateral (in the case of a funded synthetic CRT) or the counterparty (in the case of an unfunded synthetic CRT)). In addition, because banks are allowed to include the impact of interest rate hedges and credit loss protection in their stress

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test analysis they should be able to receive credit for reducing loan type concentration through a CRT against the loan portfolio with significant concentration.

- **How will SPE-issued CLNs and the cash custodial account impact average assets and risk weighted assets?**

  So long as the SPE is not consolidated with the bank under GAAP and the cash collateral is not deposited with the bank, the CLN is not on the bank's balance sheet and the cash collateral provided by the SPE is held by the custodial bank. As such, this structure would not "gross up" the bank's balance sheet.

- **How will the CRT be impacted by the insolvency of the bank?**

  Whether the CRT remains in place following the insolvency of the bank is primarily up to the FDIC. Under the Federal Deposit Insurance Act ("FDIA"), the FDIC, as conservator or receiver, may enforce the CDS against the SPE or other CDS counterparty (or the CLN against the holders thereof, in the case of a directly-issued CLN) even if there is a provision in the CDS (or directly-issued CLN indenture) providing for termination, default, acceleration or exercise of rights upon, or solely by reason of, the insolvency of the bank.

  o If the FDIC were to enforce the CDS (or the directly-issued CLN), the CRT transaction would continue despite the insolvency of the bank. The bank would continue to receive credit protection under the CRT provided that it continues to make required payments under the CDS (or the directly-issued CLN) pursuant to the terms thereof.

  o If the FDIC were to repudiate the CDS (or the directly-issued CLN), the effect would be to terminate the CDS (or accelerate the maturity of the directly-issued CLN). Such repudiation would result in a claim of the CDS counterparty (or the directly-issued CLN holders) against the conservatorship or receivership for amounts owed through the date of the appoint of the FDIC as conservator or receiver.

  Notwithstanding the foregoing, the SPE or other counterparty may exercise its right to terminate the CDS upon a FDIC receivership unless the FDIC transfers the CDS to a bridge bank within one business day from the commencement of such receivership.[145]

- **Isn't there a risk that the credit risks shed by CLN-issuing banks becomes overly concentrated in a narrow group of non-bank investors?**

  We don't see that as a significant risk, in that there is already a broad and deep pool of investors. As we noted earlier in the paper, Freddie Mac and Fannie Mae have conducted may credit risk transactions since 2013, under which they transferred a portion of credit risk on approximately $6.7 trillion of unpaid principal balance of single-family residential mortgages. These transactions have built a diverse base of sophisticated investors with a deep knowledge of, and interest in, CRTs. This investor base includes asset managers, hedge funds, insurance companies, and REITs, creating a new market for pricing and trading mortgage credit risk. This broad and deep pool of sophisticated investors not only provides a

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[145] The FDIC may transfer the CDS to another party, including a bridge bank, without any approval, assignment, or consent with respect to such transfer.

source of stable funding for CRTs, it also helps to ensure that the credit risk shed by banks *via* CRTs does not become overly concentrated in a narrow or shallow portion of the non-banking sector.

- **If an investor borrows money from a third-party bank to help finance its investment in a CLN, isn't the credit risk shed by the CLN-issuing bank just coming back into the banking system *via* the loan to the investor by that third-party bank?**

No. First, the advance rates on such loans are low (typically, 70% or less), meaning that a large portion of the CLN purchase price is funded by the investor's equity, not the bank loan. Second, and more importantly, the loan made by the third-party bank will have its own credit risk weight based on the characteristics of that loan (*e.g.*, whether the loan is non-recourse or full recourse). The lending bank will have to hold capital against any loan that it makes to an investor, and so nothing is "falling through the cracks" from the perspective of the overall amount of capital in the banking system. All credit risks are being captured and risk weighted accordingly.

There's nothing unusual about one bank's reducing its risk-weighted assets and another bank's increasing its risk-weighted assets in connection with the same transaction. For example, a bank may choose to simply sell a loan portfolio to reduce its risk-weighted assets, and the loan buyer may finance its purchase of that loan portfolio by borrowing funds from another bank. The selling bank has clearly achieved a *bona fide* reduction of its risk-weighted assets, and the lending bank has clearly increased its risk weighted assets as a result of its loan to the buyer. The selling bank will no longer have to hold capital against the loans that it sold, whereas the lending bank will have to hold capital against the loan that it made to the buyer. From the perspective of the overall amount of capital in the banking system, all credit risks and related capital requirements have been captured and allocated to the bank holding them. The same principle applies when a bank issues a CLN, instead of selling a loan portfolio, to reduce its risk weighted assets.

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X. APPENDICES

Appendix 1

Distribution of Bank Size and Banking Assets

Bank Size (Assets (A))	# of Banks in this Category	% of Banks in this Category	Banking Assets Held by Banks in this Category ($ in thousands)	% of Banking Assets Held by Banks in this Category
U.S. GSIBs	8	0.18%	$15,639,178,000	51.90%
$250B < A < U.S. GSIBs	8	0.18%	$3,856,865,537	12.80%
$100B < A < $250B	20	0.45%	$3,637,219,075	12.07%
$10B < A < $100B	125	2.82%	$3,620,279,987	12.02%
$3B < A < $10B	237	5.35%	$1,287,565,752	4.27%
A < $3B	4,036	91.02%	$2,090,036,439	6.94%
Total:	*4,434*	*100.00%*	*$30,131,144,790*	*100.00%*

Source: S&P Global Market Intelligence data as of September 30, 2024.[146]

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[146] Raymond James as of June 30, 2024.

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Appendix 2

Simplified Supervisory Formula Approach (SSFA)

SSFA is a mathematical model used to assign risk weights to securitization exposures under the Capital Rules' standardized approach. Under SSFA, the risk weight for a securitization exposure is the average value of the marginal risk weighting function, $RW'(t)$, over the interval $t = A$ to $t = D$, where **A** and **D** are the attachment and detachment points, respectively, of the securitization exposure.

$$RW'(t) = 1,250\% * e^{\left(-\frac{1}{pK_A}\right)(\max t - K_A, 0)}$$

where:

- **p** is the supervisory calibration parameter (the p-factor), which has a fixed value of 0.5.

- K_A is the capital requirement of the underlying exposures, adjusted for defaults.

- **t** is a given point of seniority in the securitization's capital structure, ranging from 0 (the very bottom) to 1 (the very top).

Note that when $t - K_A \leq 0$, the expression simplifies to: $RW'(t) = 1,250\% * e^{(0)} = 1,250\%$. This means that any portion of a securitization tranche that sits below K_A is assigned a 1,250% risk weight. After the point K_A, marginal risk weights decline exponentially as seniority increases. The rate of decline is governed by the term $\left(-\frac{1}{pK_A}\right)$.[147] A larger denominator causes marginal risk weights to decline relatively slowly, thus leading to relatively higher risk weights.[148] A smaller denominator causes marginal risk weights to decline relatively rapidly, thus leading to relatively lower risk weights.[149]

Although the marginal risk-weighting function, $RW'(t)$, is not explicitly referenced in the Capital Rules, it can be recovered from the formula that is in the Capital Rules, which provides the closed-form solution – *i.e.*, the average value of $RW'(t)$ over the interval [A, D]. That formula[150] is:

$$RW_{SSFA} = \left[\left(\frac{K_A - A}{D - A}\right) * 1,250\%\right] + \left[\left(\frac{D - K_A}{D - A}\right) * 1,250\% * K_{SSFA}\right]$$

This portion of the function provides that any portion of a securitization exposure junior to K_A is assigned a risk weight equal to 1,250%. This portion of the function provides that any portion of a securitization exposure senior to K_A is assigned a risk weight equal to 1,250% * K_{SSFA}.

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[147] $RW'(t)$ is an exponential decay function, and the term $\left(-\frac{1}{pK_A}\right)$ is the rate of exponential decay. Exponential decay functions are commonly used in hedging and other financial calculations.

[148] This is why the Basel III Endgame proposal to double of the p-factor (from 0.5 to 1.0) is so troubling. Taken to the extreme, as the p-factor approaches infinity, the denominator approaches infinity, which causes the rate of decline to approach zero. Thus the marginal risk weight would remain stuck at 1,250% across the entire capital structure.

[149] As the denominator approaches 0, the rate of decline approaches infinity. Thus, the marginal risk weight for all points senior to K_A would immediately drop to zero.

[150] *See* 12 C.F.R. §217.43(c).

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The various parameters used in the function RW$_{SSFA}$ above are described in the following table.

Parameter	Description
K_A	$(1 - W) * K_G + (0.5 * W)$
K_G	Weighted average total capital requirement of the underlying exposures. If an underlying asset has a risk weight of 100%, its K_G would be 8%.
W	Proportion of the underlying exposures that are: (i) in default, (ii) 90 or more days past due, (iii) with certain exceptions, has contractually deferred payments for 90 days or more, (iv) held as real estate owned, (v) subject to a bankruptcy or insolvency proceeding, or (vi) in the process of foreclosure.
A	Attachment point for the securitization exposure, which represents the threshold at which credit losses will first be allocated by the exposure.
D	Detachment point for the securitization exposure, which represents the threshold at which credit losses of principal allocated to the exposure would result in a total loss of principal.
K_{SSFA}	$\dfrac{e^{a*u} + e^{a*l}}{a(u - l)}$
a	$\left(-\dfrac{1}{pK_A} \right)$
p	A "supervisory calibration parameter" equal to 0.5. Note that p = 1.5 for resecuritization exposures.
u	$D - K_A$
l	$\max(A - K_A, 0)$
e	2.71828..., the base of the natural logarithms.

Appendix 3

Deriving the Synthetic CRT Provisional Break-Even Pricing Formula

As used below:

$Asset_{RW}$ is the risk weight assigned to the bank assets in the reference portfolio.

$Premium_{ATX}$ is the after-tax premium the bank is required to pay for credit protection under the CDS in a given synthetic CRT (measured as cost per notional dollar hedged).

$\Delta Capital$ means the amount of incremental regulatory capital a bank would need to increase its targeted capital ratio to its desired level, assuming no changes to risk-weighted assets.

ΔRWA means the amount of risk weighted assets a bank would need to shed to increase its targeted capital ratio to its desired level, assuming no changes to capital. For clarity, if the bank needs to decrease its risk-weighted assets by $100, ΔRWA is expressed as $100, not -$100.

$SSFA_{RW}$ is the risk weight assigned to the senior credit tranche under SSFA.

TCR' is the bank's targeted capital ratio. The targeted capital ratio can be the CET1 capital ratio, the tier 1 capital ratio or the total capital ratio, depending on the bank's strategic objectives.

$WACC_R'$ is the bank's weighted average cost of capital for the amount of incremental regulatory capital that it would need to raise to reach $TCR.'$ $WACC_R'$ varies based on the composition of the incremental capital raised, whether through CET1, AT1, or T2 instruments.

Denominator Strategy: Reduce Total Risk Weighted Assets by ΔRWA		Numerator Strategy: Increase Total Regulatory Capital by ΔCapital
Denominator Strategy ATX Cost	$=$	**Numerator Strategy ATX Cost**
Notional Amount of Hedge $*$ Premium$_{ATX}$	$=$	ΔCapital $*$ WACC_R$'$
{Divide each side by ΔRWA}		
$\dfrac{\text{Notional Amount of Hedge} * \text{Premium}_{ATX}}{\Delta\text{RWA}}$	$=$	$\dfrac{\Delta\text{Capital} * \text{WACC\_R}'}{\Delta\text{RWA}}$
Note that: Notional Amount of Hedge= Size of junior credit tranche (J%) $*$ Notional Amount of Reference Portfolio (N$_P$)		Note that: $\dfrac{\Delta\text{Capital}}{\Delta\text{RWA}} = \text{TCR}'$
$\dfrac{\text{J\%} * \text{N}_P * \text{Premium}_{ATX}}{\Delta\text{RWA}}$	$=$	TCR$'$ $*$ WACC_R$'$
Note that: ΔRWA $=$ Asset$_{RW}$ $*$ N$_P$ $-$ (S% $*$ SSFA$_{RW}$ $*$ N$_P$) $-$ (J% $*$ C$_{RW}$ $*$ N$_P$) where C$_{RW}$ is the risk weight of the financial collateral (unfunded CRT) or derivative counterparty (funded CRT).		
$\dfrac{\text{J\%} * \text{N}_P * \text{Premium}_{ATX}}{\text{Asset}_{RW} * \text{N}_P - (\text{S\%} * \text{SSFA}_{RW} * \text{N}_P) - (\text{J\%} * \text{C}_{RW} * \text{N}_P)}$	$=$	TCR$'$ $*$ WACC_R$'$
Note that: N$_P$ in the numerator and denominator cancels out.		
$\dfrac{\text{J\%} * \text{Premium}_{ATX}}{\text{Asset}_{RW} - (\text{S\%} * \text{SSFA}_{RW}) - (\text{J\%} * \text{C}_{RW})}$	$=$	TCR$'$ $*$ WACC_R$'$
Rearranging to solve for Premium$_{ATX}$ gives the provisional break-even after-tax price for the denominator strategy. We call that break-even price Premium$'_{ATX}$.		
$\text{Premium}'_{ATX} = (\text{TCR}' * \text{WACC\_R}') * \left[\dfrac{\text{Asset}_{RW} - (\text{S\%} * \text{SSFA}_{RW}) - (\text{J\%} * \text{C}_{RW})}{\text{J\%}}\right]$		

Note that:

- $\text{Premium}'_{ATX}$ is the provisional breakeven after-tax Premium the bank must pay to the SPE or the counterparty for credit protection. The Premium that must be paid as described in the CDS documentation will be expressed in pre-tax dollars. Therefore, the breakeven pre-tax Premium would be $\text{Premium}'_{ATX} * \frac{1}{1-t}$, where **t** is the bank's marginal tax rate.

- We refer to $\text{Premium}'_{ATX}$ as the "provisional" breakeven after-tax Premium because prudent bank management and boards will prepare a detailed financial analysis, including market-based assumptions, balance sheet and income statement models, impact on earnings-per-share, capital ratios and *pro forma* financial results in comparing alternative strategies. The impact of transaction costs, as well as the impact of RWA reduction on the amount of AACL included in T2, and deducted from RWA, would need to be considered as part of this analysis.

- Note that the pricing of the CLNs involves two components: (1) a pass-through of a portion of the Premium that is paid by the bank under the CDS documentation and (2) investment earnings (*e.g.*, money market or SOFR-based returns) on the amount invested by the CLN investors. Of course, the returns that CLN investors require will directly impact the cost of credit protection to the bank (*i.e.*, the Premium).

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XI.   BIOGRAPHIES

Christopher B. Horn, Cadwalader

Christopher Horn is a partner in the Financial Services Group. He focuses his practice on securities regulation with a particular focus on regulatory issues in securitizations and structured finance. He has experience representing issuers, borrowers, and commercial and investment banks in a variety of public and private asset-backed securities offerings, commercial paper conduit facilities and other forms of financing involving a wide variety of assets. Chris also has experience representing trustees in connection with RMBS litigation and regulatory matters.

Chris frequently advises on the regulatory aspects of securitization and structured finance transactions, with a particular focus on the evolving impact of the Dodd-Frank Act and the U.S. bank regulatory capital rules. He has published numerous articles on structured finance topics and authored multiple comment letters on behalf of clients and industry trade groups relating to the proposed rules under the Dodd-Frank Act and Regulation AB, as well as the U.S. bank regulatory capital rules.

Chris is a frequent speaker at industry conferences and is an active member of the Securitization and Structured Finance Committee of the American Bar Association. Widely recognized for his work with industry associations, Chris routinely works on high-profile projects for the Securities Industry and Financial Markets Association (SIFMA) and the Structured Finance Association (SFA). Chris is also an Adjunct Professor of Law at the New York University School of Law, where he teaches "The Law of Securitization."

Chris earned his J.D., *cum laude*, from University of Illinois College of Law, where he was Associate Editor of *University of Illinois Law Review*, and his B.A., from Northwestern University. He is admitted to practice in the States of New York and Illinois.

Jed Miller, Cadwalader

With over 15 years of experience, Jed focuses his practice on novel and innovative structured financing solutions, with an emphasis on transactions that combine securitizations and derivatives. He regularly represents buy-side and sell-side institutions in connection with:

- Synthetic securitizations, credit-linked notes, credit default swaps (including tranched portfolio CDS), derivative product companies (DPCs) and other credit-risk transfer (CRT) products.

- Cash securitizations of a wide range of asset classes, including fund interests (CFOs and rated feeders), corporate loans, receivables, municipal securities (tender option bonds), commercial and residential mortgages, intellectual property, automobile loans, and distressed and non-performing assets.

Jed is frequently called upon by clients to advise on securities law, UCC, bankruptcy, tax and other legal and regulatory issues. He is an expert on U.S. bank regulatory capital rules (Regulation Q)—in particular, as they relate to capital relief strategies that involve synthetic securitizations, credit default swaps and other financial products—as well as Dodd Frank's risk retention rules for securitization transactions.

Jed authors publications on a variety of topics related to the financial markets and makes frequent speaking appearances at structured finance industry events. In 2023, Jed was named a "key lawyer" by Legal 500 in Cadwalader's Tier 1 Derivatives and Structured Products practice. In 2022, he was named a "Rising Star Partner" by *IFLR1000* in the area of Derivatives, and in 2021, Jed was named a "Rising Star" by *Law360* in the area of Structured Finance. Jed is a member of the New York City Bar's Structured Finance Committee and the Structured Finance Association's Credit Risk Transfer Market Committee.

Jed earned his J.D., *cum laude*, from Case Western Reserve University, and his B.A., *magna cum laude*, from Oklahoma State University. He is admitted to practice in the State of New York.

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Andrew Karp, Cadwalader

Andrew is a partner in Cadwalader's bank regulatory practice and resident in the New York office. Andrew is a seasoned attorney with extensive experience in-house at major banks, major law firms and bank regulators. Andrew has substantial experience in complex bank regulatory issues such as the Volcker Rule, bank M&A, bank control issues, bank capital rules (Regulation Q), bank prudential standards (Regulation YY), affiliate transactions, Bank Holding Company Act issues, tying, bank receiverships, QFCs, non-U.S. activities, sanctions, and bank capital requirements.

Andrew has over 25 years' experience representing banks and other financial institutions. Most recently he served as Deputy General Counsel and then Senior Special Counsel to the General Counsel at the Federal Deposit Insurance Corporation from 2020 to 2024. Prior to joining the FDIC, Andrew spent 10 years at the Bank of Montreal, including as its U.S. General Counsel, and five years as a Managing Director and Senior Managing Counsel at Bank of New York Mellon. Earlier in his career, Andrew worked in private practice at international law firms, including Cadwalader. Andrew began his career as an attorney in the Office of the General Counsel at the Federal Reserve System.

Andrew was named to the 2023 *Law360* Banking Editorial Board, and has been recognized in *Legal 500* and *International Law Office/GC Magazine* (including as Financial Regulatory Lawyer of the Year in 2013).

Andrew received his J.D. in 1987 from Vanderbilt University Law School and is a 1984 graduate of Georgetown University (B.A., History).

Ivan Loncar, Cadwalader

Ivan Loncar, co-chair of the Financial Services Group, focuses his practice on derivatives, structured finance and municipal finance (including distressed municipal finance).

Ivan represents dealers, banks, and other financial institutions in connection with (i) unfunded derivatives involving a wide range of products (*e.g.*, interest rate swaps, credit default swaps, total return swaps, commodity swaps, etc.) and counterparty types and (ii) funded derivative products (*e.g.*, credit linked notes and other structured notes, repackaging transactions, market access trades, etc.). He also has extensive experience with the structuring of derivatives product companies and the repackaging of swap receivables, capital relief trades (CRTs) and other structured transactions that combine securitization techniques and derivative products.

Ivan is regularly ranked as a leading lawyer in derivatives and structured finance in legal directories, including *Chambers Global, Chambers USA, Legal 500 US, IFLR 1000* and *The Best Lawyers in America.* Ivan has also been recognized by *Legal 500 US* as a leading lawyer in municipal bankruptcy and derivatives and structured products. Notably, Ivan has been described by clients in *Chambers USA* as "tremendous" and "incredibly thoughtful and knowledgeable," and in *Legal 500 US* as "simply outstanding" in the municipal derivatives field and as an "expert in fixed income and credit derivatives and structured financial products." Ivan was part of the team that was named 2020 Regulatory Team of the Year by *IFLR* Americas.

Ivan is active in the International Swaps and Derivatives Association (ISDA) and Structured Finance Association (SFA) and was the co-chair of the SFA's Derivatives in Securitization Task Force.

Ivan received his LL.B. from University of Belgrade School of Law and his LL.M. from Columbia University School of Law. He is admitted to practice in the State of New York.

Thomas Killian, TWK Advisors
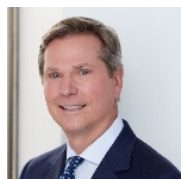
Thomas Killian is the Managing Member of TWK Advisors LLC, an advisory boutique specializing in advising investors and banking institutions considering strategic and regulatory capital strategies, balance sheet restructuring, and distressed bank acquisitions.

During his 45-year career in banking, including 32 years as a Partner and Managing Director at Sandler O'Neill and Piper Sandler, he completed over 58 transactions aggregating more than $20.5 billion in transaction value. Included among these transactions are 17 pooled trust preferred securitizations aggregating over $7 billion. He published more than 25 industry reports and comment letters covering complex regulatory and accounting considerations such as CECL, Basel III Endgame, TLAC and the Bank Merger Act that impact bank and non-bank financial institutions.

He advised numerous government agencies on significant large-scale projects for the U.S. Treasury and the FDIC. He has represented Sandler O'Neill and Piper Sandler in conferences and meetings with the Federal Financial Institutions Examinations Council, the Federal Reserve, and the Federal Deposit Insurance Corporation to discuss bank capital structure, CECL, Dodd-Frank and Basel III related issues. Mr. Killian holds a Bachelor of Science from the University of North Carolina at Chapel Hill, where he was a John Motley Morehead Merit Scholar, and a Masters in Business Administration from Northwestern University's J.L. Kellogg Graduate School of Management.

We gratefully acknowledge the contributions of Karen Fishman as contractor to TWK Advisors in the preparation of this report.

Mario J. Mastrantoni, KPMG

Mario Mastrantoni is a partner and the banking and capital markets leader in KPMG's Accounting Advisory Services practice. With more than two decades of controllership, technical accounting, and financial reporting and analysis experience, he has worked with multiple financial institutions across consumer finance, commercial finance, capital markets and structured finance businesses. Mario joined KPMG from the financial services industry in 2021.

Prior to joining KPMG, Mario spent over 15 years at Wells Fargo and led the accounting policy and SEC reporting functions. Mario was also a member of the AICPA's Depository Institutions Expert Panel and was a member of the FASB's Transition Resource Group for Credit Losses. Mario has a Bachelor of Business Administration in Accounting from Siena College.

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Alan J. Kuska, KPMG
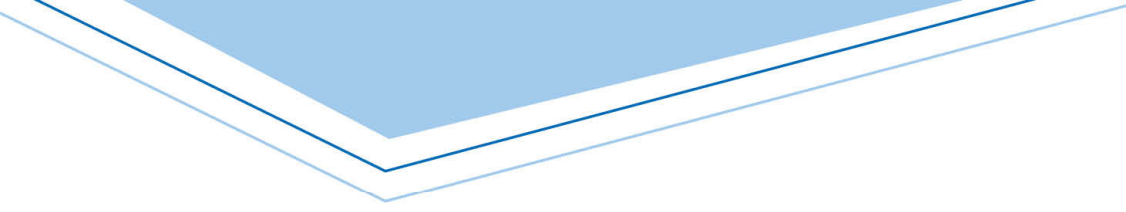
Alan is a director in the Complex Accounting Group within KPMG's Accounting Advisory Services practice with over 25 years of experience serving clients in the financial services industry. His areas of focus include business combinations, transfers and servicing of financial instruments, debt/equity, income tax credits, and consolidation under both US GAAP and IFRS. He has advised multiple regional banks on capital relief transactions since 2021.

Tyler J. Swarmer KPMG

Tyler is a Director in KPMG's Accounting Advisory Services practice, based in Charlotte, with over 8 years of experience in the financial services sector, specifically banking and capital markets. He specializes in providing advisory services with a particular focus on derivative and hedge accounting, acquisition accounting, financial reporting. Tyler delivers technical accounting guidance on complex transactions and the application of U.S. GAAP standards, including the development of comprehensive accounting policy documents and position whitepapers for financial services clients. His expertise also extends to credit relief trades, where he has provided insights and solutions related to the technical accounting and reporting of these trades.

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