**DSR** and **IRC** are components used in regulatory capital calculations, especially for **market risk capital under Basel rules**, and they affect **Risk-Weighted Assets (RWA)** indirectly through **market risk capital charges**. Here's what they are:

**2. IRC – Incremental Risk Charge**

* **What it is:** A legacy Basel 2.5 market risk capital measure (pre-FRTB).
* **Role in RWA:** Captures potential **losses from credit migrations and defaults** over a 1-year horizon at 99.9% confidence level, for credit-sensitive instruments **not captured by VaR or SVaR**.
* **Applies to:** Bonds, credit default swaps (CDS), and other positions sensitive to credit migration.
* **Phased out:** In jurisdictions adopting **FRTB**, IRC is being replaced by DSR (specifically DRC).

**DSR – Debt Specific Risk**

* **What it is:**  
  A **market risk capital component** under **Basel II.5** rules that captures **issuer-specific risk** in **debt instruments** held in the trading book.
* **Purpose:**  
  It accounts for the **idiosyncratic risk** (specific to the issuer) not captured by general risk models like VaR.
* **Calculation:**  
  Based on **standardized risk weights** depending on:
  + **Issuer credit rating** (investment grade vs high yield)
  + **Remaining maturity**
  + **Instrument type** (e.g., corporate bond, sovereign, securitized product)

**Summary: Debt Specific Risk (DSR) Model Overview**

The **Debt Specific Risk (DSR)** model is designed to measure **idiosyncratic (issuer-specific) credit spread risk** in **non-securitized credit products** (corporate bonds, CDS, CDS indices), **excluding** default, migration, and broad market risks. This is a **modeled component of Market Risk Capital**, distinct from General VaR and Stressed VaR.

**Key Features of the DSR Model:**

* **Captures:** Daily spread volatility not explained by market-wide movements.
* **Does NOT capture:** Default, migration, or event risk (those are covered under IRC or DRC).
* **Inputs include:**
  + Individual bond spreads (including callable and non-callable)
  + Ticker-level CDS spreads
  + Sector CDS time series
  + Generic rating-based spread curves
  + Zero curves
  + One year of historical data (CUSIP-level)
* **Methodology:** A regression model decomposes total credit spread risk into:
  + **Market Component** (captured in General VaR)
  + **Idiosyncratic Component** (captured in DSR)
* **Calibration:** Biweekly, using Markit and RFDM data
* **RWA Impact:** DSR feeds into modeled specific risk capital, which contributes to total Market Risk RWA

**Callable Bonds and DSR: Special Considerations**

Callable bonds introduce **additional complexity** into DSR modeling due to their **embedded option** features. These bonds differ from plain vanilla (option-free) bonds because their **spread behavior is impacted by callability** and **issuer-specific volatility assumptions**.

**3 Key Angles to Handle Callable Bonds in DSR:**

1. **Embedded Option Volatility Impact**
   * Callable bonds' prices reflect both credit and **interest rate volatility**.
   * To isolate the **pure credit spread** (for DSR purposes), we need to **strip out the option value**.
   * This requires:
     + Observable bond prices
     + An appropriate option-adjusted spread (OAS) calculation
     + Volatility inputs (market-implied or modeled)
2. **Front Office Pricer Alignment**
   * Front Office (FO) pricers typically model callable bonds using **log-normal defaultable term structures**.
   * DSR should align with the FO pricer **inputs**:
     + Use **name-specific credit spreads** instead of generic or rating-based curves
     + Ensure **Credit DV01** is calculated using implied vol, not oversimplified proxies
3. **VaR Model Consideration**
   * Current VaR models (e.g., RVF+) may not account for **hazard rates** or defaultable bond features.
   * For callable bonds to be accurately reflected in DSR or total VaR:
     + A shift toward models incorporating **spread drivers** and **interest rate volatility** may be needed
     + Any such shift would constitute a **model change** and require governance approval

**DSR and Callable Bonds: Incorporation Strategy**

To **incorporate callable bonds effectively in DSR**:

1. **Separate callable vs. option-free treatment**
   * Treat callable bonds using **option-adjusted spreads (OAS)**
   * Maintain option-free bond logic for standard DSR calculations
2. **Enhance inputs**
   * Pull **implied volatility** and OAS from FO pricers or vendor models
   * Use **issuer-level credit spread curves** for greater precision
3. **Model Enhancements (future state):**
   * Integrate callable bond logic into DSR with **modular regression layers**
   * Factor in **call probability** as an input (either deterministic or stochastic)
4. **Governance**
   * Document modeling assumptions, especially for callable bonds
   * Clearly state whether **option effects** are explicitly excluded, adjusted, or modeled

**Debt Specific Risk (DSR) – Full Model Documentation**

**1. Purpose of the DSR Model**

The **Debt Specific Risk (DSR)** model is designed to capture **idiosyncratic risk** (issuer-specific spread movements) in **unsecuritized credit products** such as:

* Corporate bonds (non-securitized)
* CDS (Credit Default Swaps)
* CDS indices

**DSR excludes:**

* Broad-based market price changes
* Default risk
* Credit migration risk
* Event risk

In simple terms: DSR models **what’s left over** — the risk that is not explained by general market movements.

**2. Inputs to the DSR Model**

* **Bond prices/yields** from Markit (CUSIP-level)
* **Individual bond spreads** (including callable and non-callable bonds)
* **Ticker-level CDS spreads**
* **CDS sector time series** ()
* **1-year historical bond spread per CUSIP**
* **Zero curves** and generic spread curves (based on rating, tenor)
* **Spread-to-Treasury**
* **Spread-to-generic rating time series**

Data feeds include:

**3. Spread Calculations and Calibration**

For each issuer:

1. Pull bond prices and derive YTM.
2. Interpolate to required tenor.
3. Calculate:
   * Spread to Treasury
   * Spread to rating-based time series
   * Spread to sector CDS
4. Use historical spread data for Monte Carlo calibration.

**4. Historical Data Requirements**

* **DSR / IRC**: Requires **1 year** of daily historical spread data.
* **IDR (e.g., CCAR models)**: May require history back to **2008**.

**5. Callable Bonds in DSR – Three Angles**

**Angle 1: Embedded Volatility**

* Callable bonds include an option to call.
* This embeds **interest rate volatility** into the price.
* DSR must **isolate credit spread risk** from optionality.
* Requires:
  + Option-Adjusted Spread (OAS)
  + Implied volatility input

**Angle 2: Front Office Pricer**

* FO pricer typically uses **defaultable log-normal models**.
* Must ensure inputs to FO and DSR align:
  + Use **name-specific spreads**, not generic rating curves.
  + Determine correct **Credit DV01** (realized vs. implied vol-based).

**Angle 3: VaR Consideration**

* Current VaR model (e.g., **RVF+**) does **not** incorporate:
  + Defaultable term structures
  + Hazard rates
* Using callable bond logic may require:
  + Model change approval
  + Introduction of **Spread Driver** and **IR\_VOL**

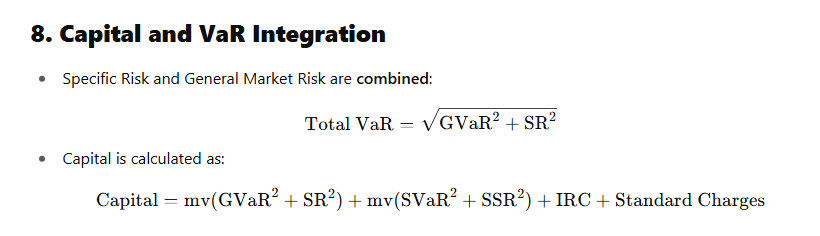
**6. Regression-Based Modeling Approach**

* DSR uses a **beta regression model**:
  + Models daily **total spread return** of issuer
  + Decomposes into:
    - **Market component** (General VaR)
    - **Specific component** (DSR)
* Calibrated **biweekly**

**7. Historical Data Used for Calibration**

* 1-year **bond spread series** by CUSIP
* 1-year **CDS spread series** by tenor and convention
* 1-year **generic CDS spread series**
* 1-year **generic bond zero curves** (RFDM)
* **Issuer type** (ODRStaging) and **rating** (EDS)

**8. Capital and VaR Integration**



**9. Products Covered Under DSR**

* **Corporate Bonds (non-callable)**
* **High-Yield Bonds (non-callable)**
* **CDS (single name)**
* **CDS Index (CDX)**

**10. Exclusions and Standard Charges**

* **Securitized instruments (e.g., SCDO, RMBS, CLOs)** are excluded.
* Moved to **Standardized Specific Risk Charge (SSRC)**

**11. Governance and Taxonomy Changes**

* **April 2017**: Agency Bonds (non-callable) moved to Standard Charge
* **July 2019**: Bonds with cleanup calls reclassified as **option-free**, aligning with industry practice (not a model change)

**12. Desk Strategy – Investment Grade (IG)**

* **Focus:** Investment grade bonds (BBB- or higher), derivatives
* **Functions:**
  + Market making
  + Primary distribution
  + Internal trade flows
* **Hedging Instruments:**
  + Corporate bonds
  + CDS, CDX
  + Treasuries, IRS, futures
  + FX hedges (for non-USD)

**13. Desk Strategy – High Yield (HY)**

* **Focus:** Sub-investment grade (BB+ or lower), bonds, CDS
* **Functions:**
  + Secondary market making
  + Distribution of risk
* **Restrictions:** No correlation/arbitrage strategies
* **Hedging Tools:** Same as IG, with added electronic trading for odd-lots

**14. Market Risk Capital and RWA Components**

* **Market Risk RWA (as of Feb 2025):** ~$66.6B
* **Standardized Specific Risk RWA:** ~$15B (23% of total)

**Components include:**

* Corporate debt (with call features)
* GSE debt (agency bonds, MBS)
* Equities (basket options, vol futures)

**15. Modeled vs. Non-Modeled Risk**

* **Modeled Specific Risk:**
  + Captured in GVaR, SVaR, IRC
* **Non-modeled Specific Risk:**
  + Reported under Standardized Charges
  + Based on spot RWA calculation

**16. Product Mapping and Decision Flow**

* If **regulatory model approval exists**, DSR is modeled.
* Otherwise, exposure is shifted to **standard charges**.

Examples:

* **Equity securities** → Equity SSR
* **Tranched debt** → Securitization charge
* **Option-free bonds** → Debt SSR (if not modeled)

**17. Legal Entity and Model Governance**

* **Model ID:** 10014 – Market Risk Debt Specific Risk Model
* **Entities:** Wells Fargo Bank NA, Wells Fargo Securities Intl.
* **Version History:**
  + 2005: Initial DSR model
  + 2014: Incorporated term structure and Student-t distribution