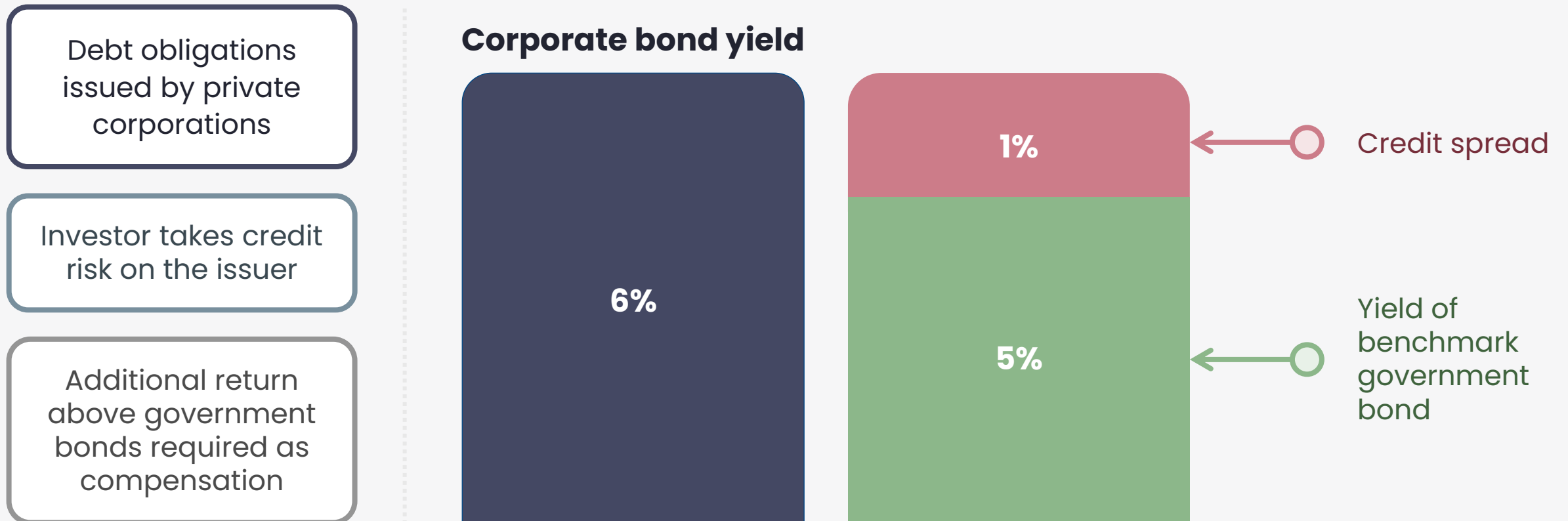


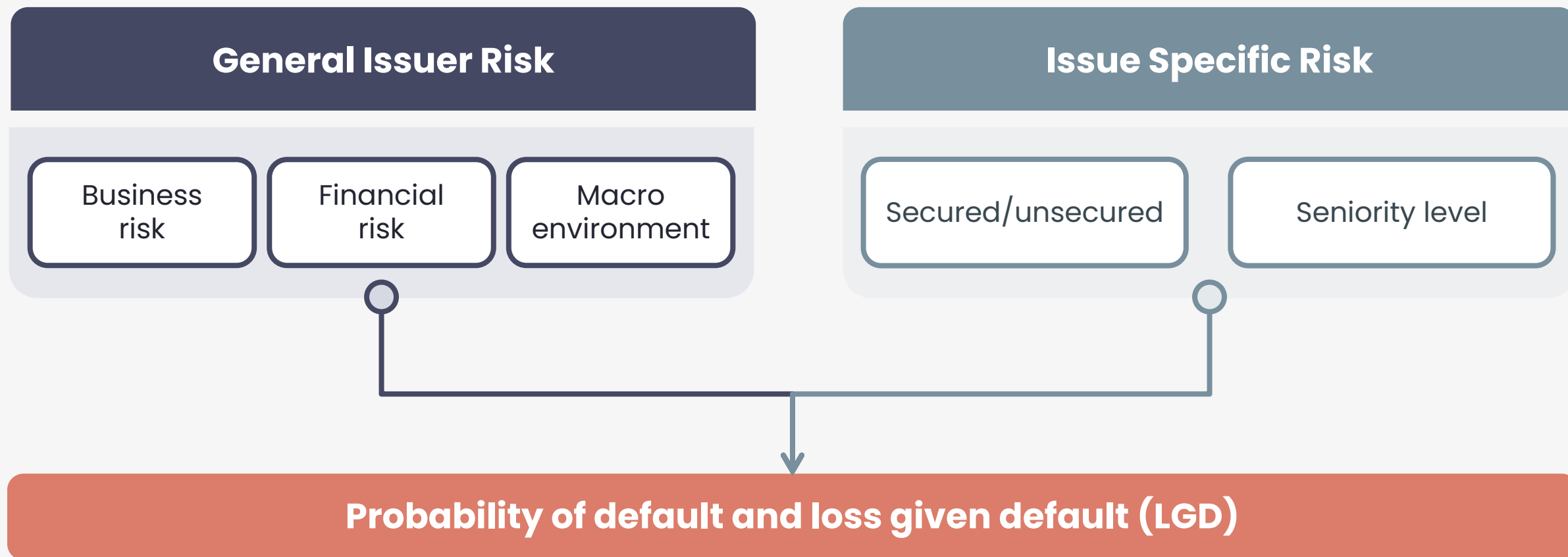


Introduction to Corporate Bonds and CDS

Corporate Bonds and Credit Spreads



How to Assess Credit Risk

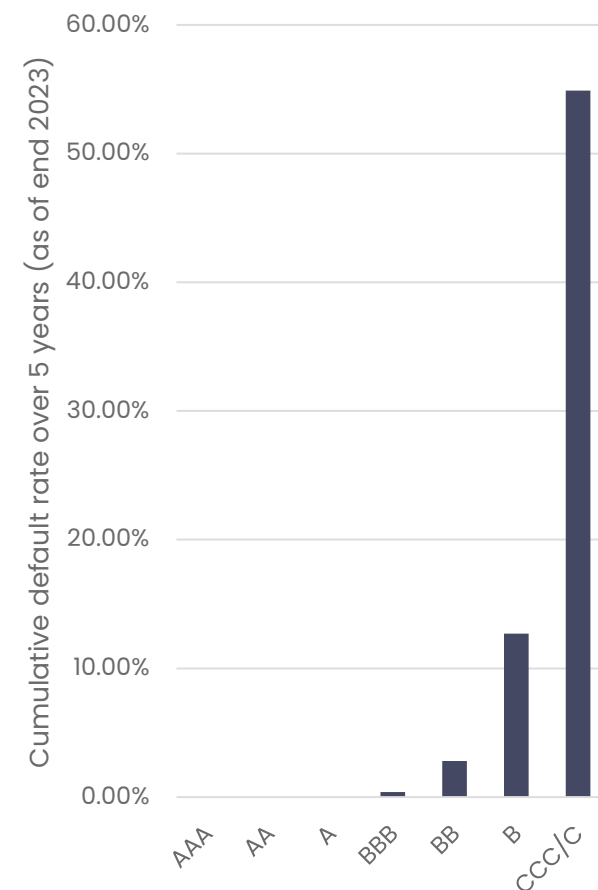


Credit Ratings

Moody's	S&P	Fitch	
Long-term	Long-term	Long-term	
Aaa	AAA	AAA	Extremely strong capacity to meet commitments
Aa1	AA+	AA+	Very strong capacity to meet financial commitments
Aa2	AA	AA	
Aa3	AA-	AA-	
A1	A+	A+	Strong capacity to meet financial commitments, somewhat susceptible to adverse economic conditions and changes in circumstances
A2	A	A	
A3	A-	A-	
Baa1	BBB+	BBB+	Adequate capacity to meet financial commitments, but more subject to adverse economic conditions
Baa2	BBB	BBB	
Baa3	BBB-	BBB-	
Ba1	BB+	BB+	Less vulnerable in the near-term but faces major ongoing uncertainties to adverse business, financial and economic conditions
Ba2	BB	BB	
Ba3	BB-	BB-	
B1	B+	B+	More vulnerable to adverse business, financial and economic conditions but currently has the capacity to meet financial commitments
B2	B	B	
B3	B-	B-	
Caa1	CCC+	CCC+	Currently vulnerable and dependent on favorable business, financial and economic conditions to meet financial commitments
Caa2	CCC	CCC	
Caa3	CCC-	CCC-	
Ca	CC	CC	Currently highly vulnerable
	C	C	Bankruptcy petition is filed but payments continue
C	RD	DDD	Payment default on financial commitments

Investment grade (IG)

High Yield (HY)



Loss Given Default

If an issuer defaults, investors' claims follow a priority waterfall:

Secured creditors are paid first from collateral, with any shortfall treated as unsecured debt. Remaining assets and cash flows then repay senior unsecured and subordinated creditors in order of priority

SECURED

Debt instruments (usually loans) are backed with specific collateral pledged by the issuer

In case of bankruptcy, lenders have the legal right to foreclose on the collateral

UNSECURED

Debt instruments that only give a general claim on the issuer's assets and cash flows

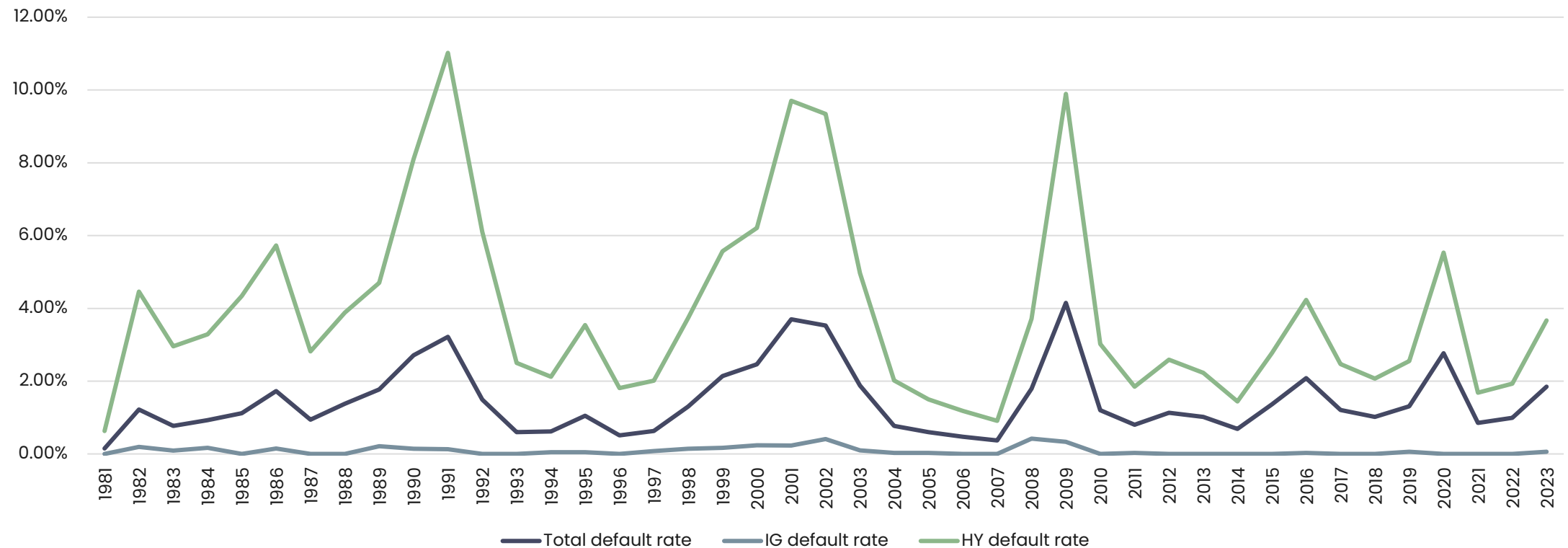
Senior unsecured

Subordinated

If assets and cash flows are insufficient to cover all claims, creditors incur losses. LGD (Loss Given Default) is the percentage of the original investment lost in default, while the recovery rate is the percentage creditors manage to recover

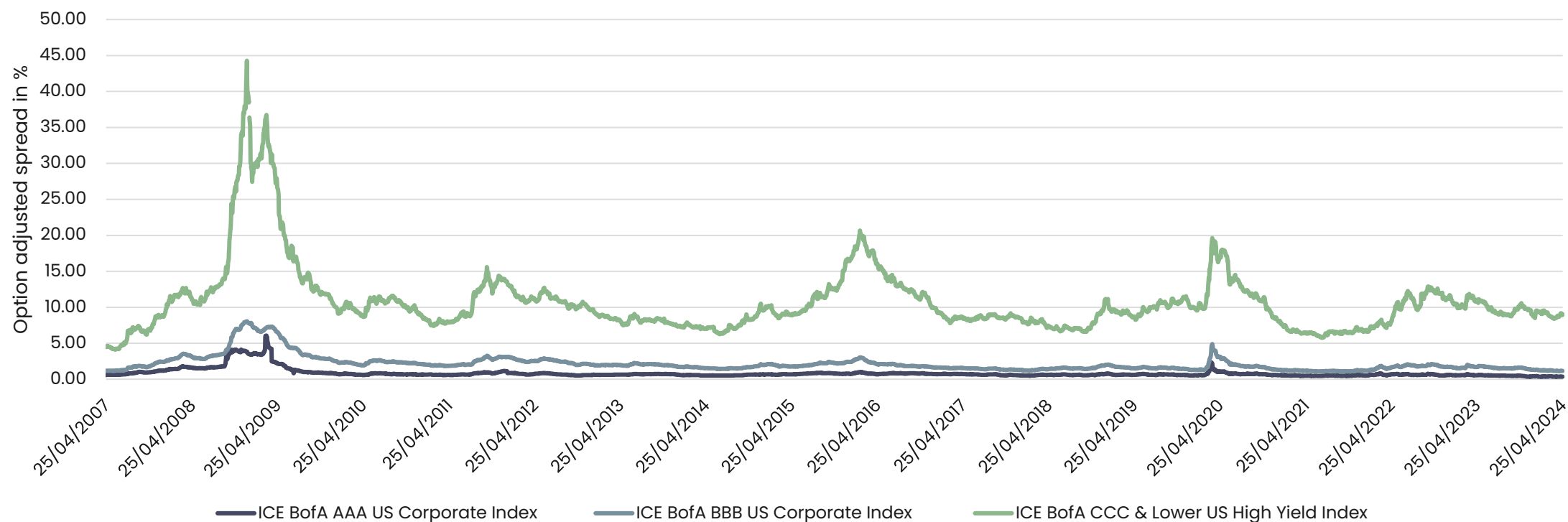
$$\text{LGD} = 1 - \text{Recovery Rate}$$

Historical Default Rates



Source: S&P Global Ratings, 2023 Annual Global Corporate Default and Rating Transition Study

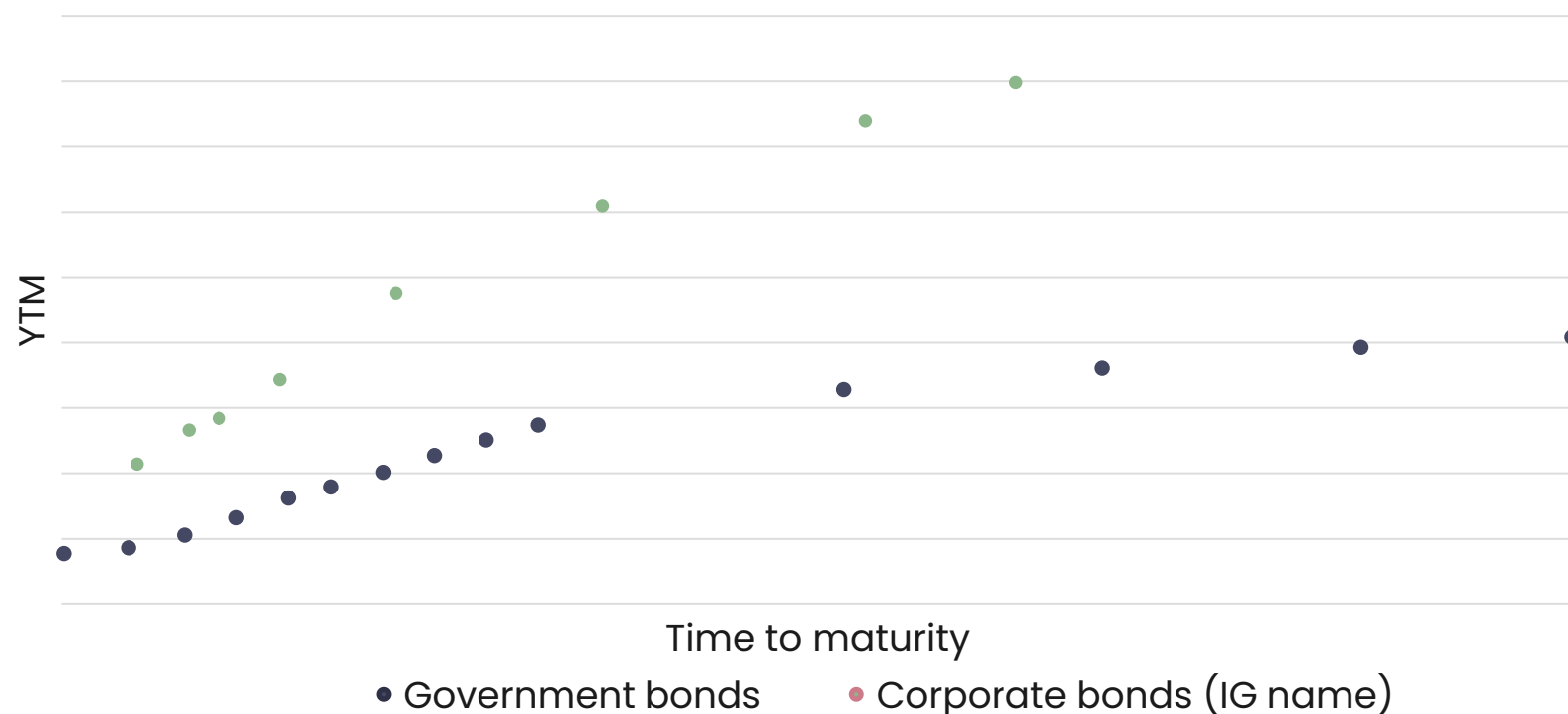
Historical Credit Spreads



Source: Federal Reserve Bank of St. Louis, FRED

Term Structure of Credit Spreads

Usually upward sloping: higher spreads for higher maturities



Different Types of Credit Spreads

In practice, **market participants** use a broad range of **different spread measures**

Most commonly used are:

G-spread

I-spread

Z-spread

OAS

ASW-spread

CDS basis

Traditional Credit Spread

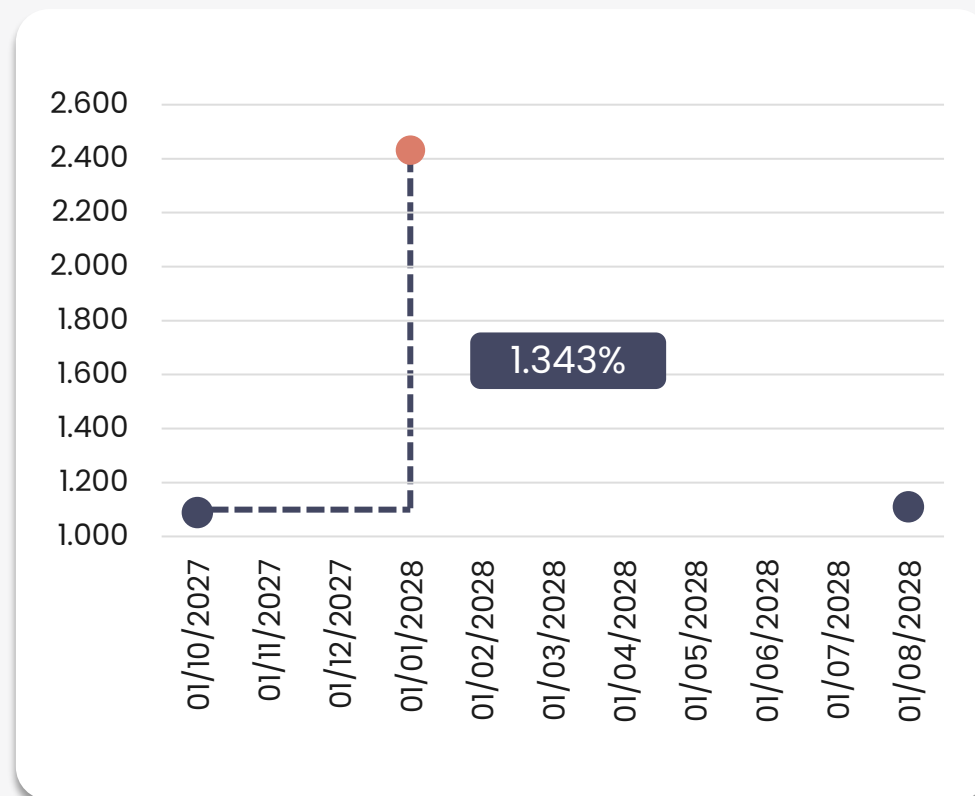
Spread between **YTM of corporate bond** and **government bond** with **closest maturity**

Issuer:	Deutsche Telekom International Finance		
Coupon:	3.25%	Clean price:	104.08%
Maturity:	17/01/2028	YTM:	2.432%

Benchmark bond:	Coupon:	Maturity:	Price:	YTM:
German Bund	1.30%	15/10/2027	101.05%	1.089%
German Bund	0.25%	15/08/2028	95.07%	1.108%

Traditional Spread 1.343%

Market data and calculations as of July 2022



G-Spread

Spread between **YTM of corporate bond interpolated government bond yield**

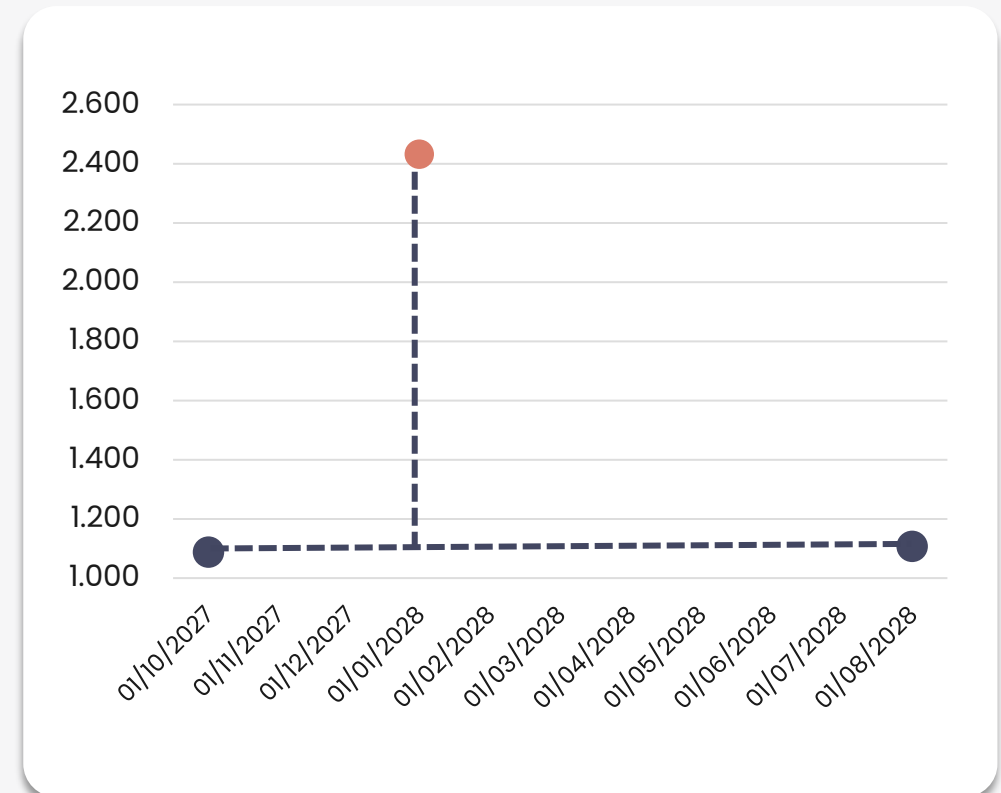
Issuer:	Deutsche Telekom International Finance		
Coupon:	3.25%	Clean price:	104.08%
Maturity:	17/01/2028	YTM:	2.432%

Benchmark bond:	Coupon:	Maturity:	Price:	YTM:
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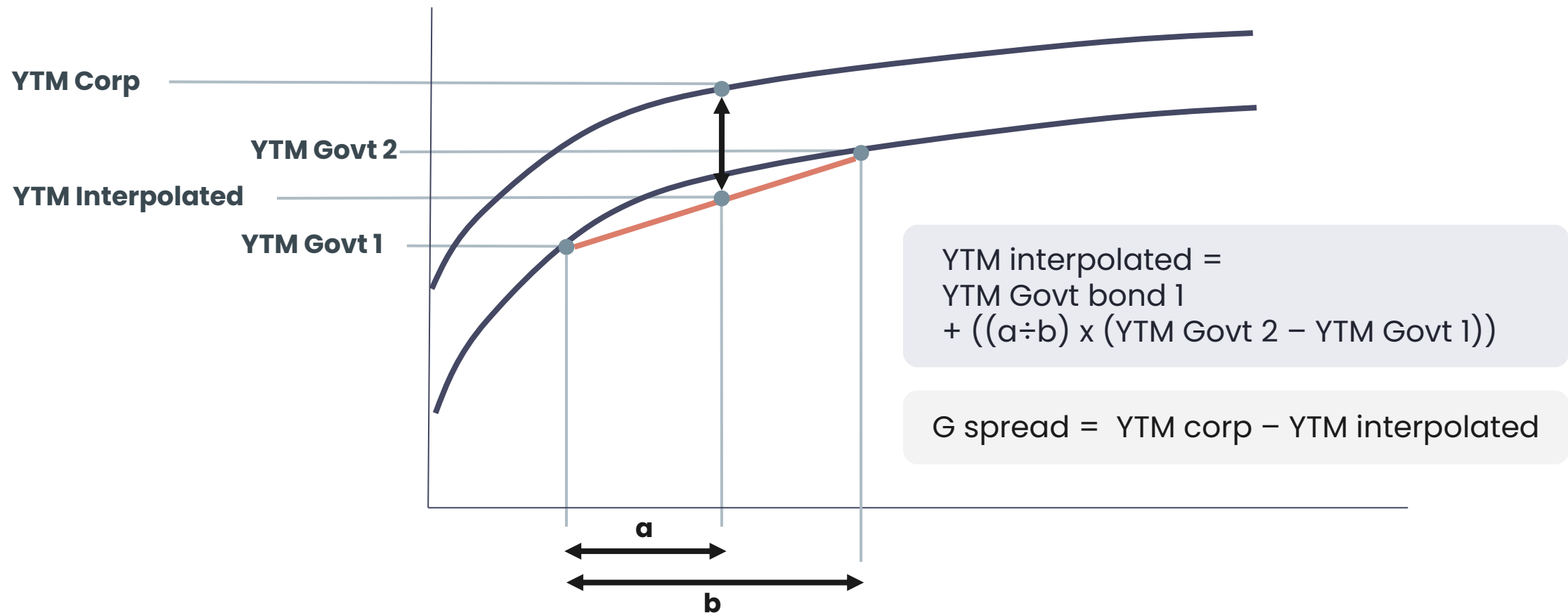
Interpolated government yield: 1.095%

G-spread: 1.337%

Market data and calculations as of July 2022



G-Spread



I-Spread

Spread between **YTM of corporate bond** and **interpolated swap rate**

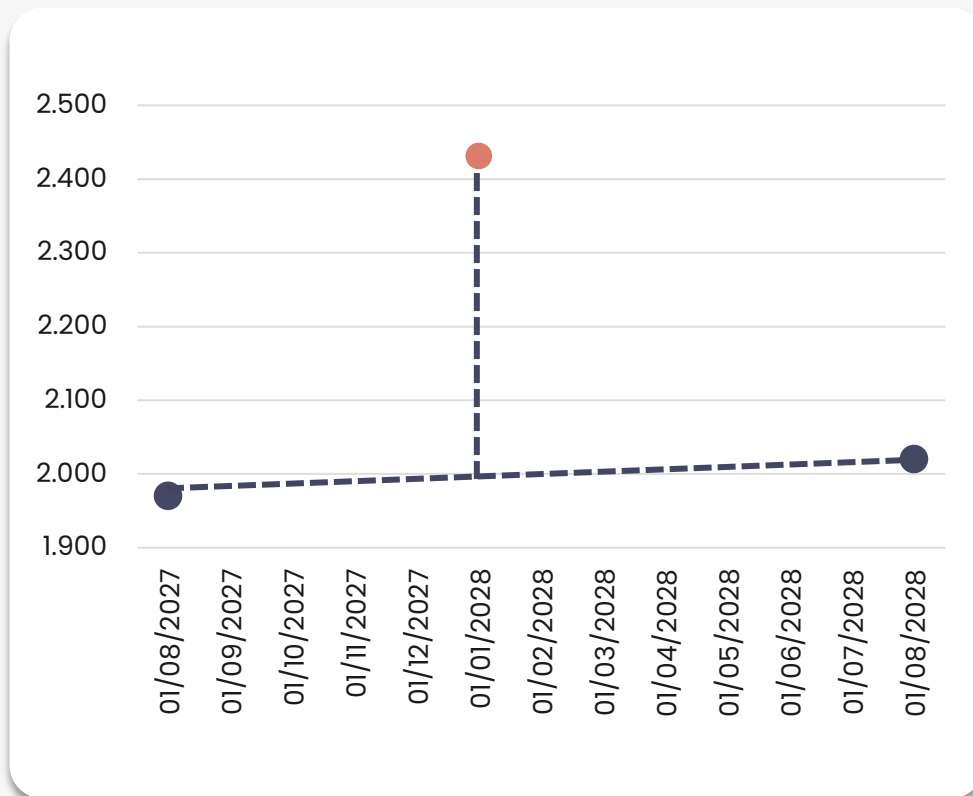
Issuer:	Deutsche Telekom International Finance		
Coupon:	3.25%	Clean price:	104.08%
Maturity:	17/01/2028	YTM:	2.432%

EUR swaps:	Swap rate:
5Y	1.97%
6Y	2.02%

Interpolated swap rate: 1.989%

I-spread: 0.443%

Market data and calculations as of July 2022



Credit Derivatives Overview

Credit derivatives allow for the **hedging** of credit risk, as well as **speculation on credit risk**

Hedging

Buying protection to reduce concentration risk, selling protection to increase diversification

Separate credit risk from lending relationship

Speculation

Outright long and short credit positions

Relative credit vies and curve trades

Underlying can be a single credit or a pool of credits. They can be customized but majority of transactions follow standard format

Single Name Credit Default Swap (CDS)

Single name CDS are protection contracts between two counterparties (protection buyer and protection seller) that provide a mechanism to hedge or trade credit risk on a single name.

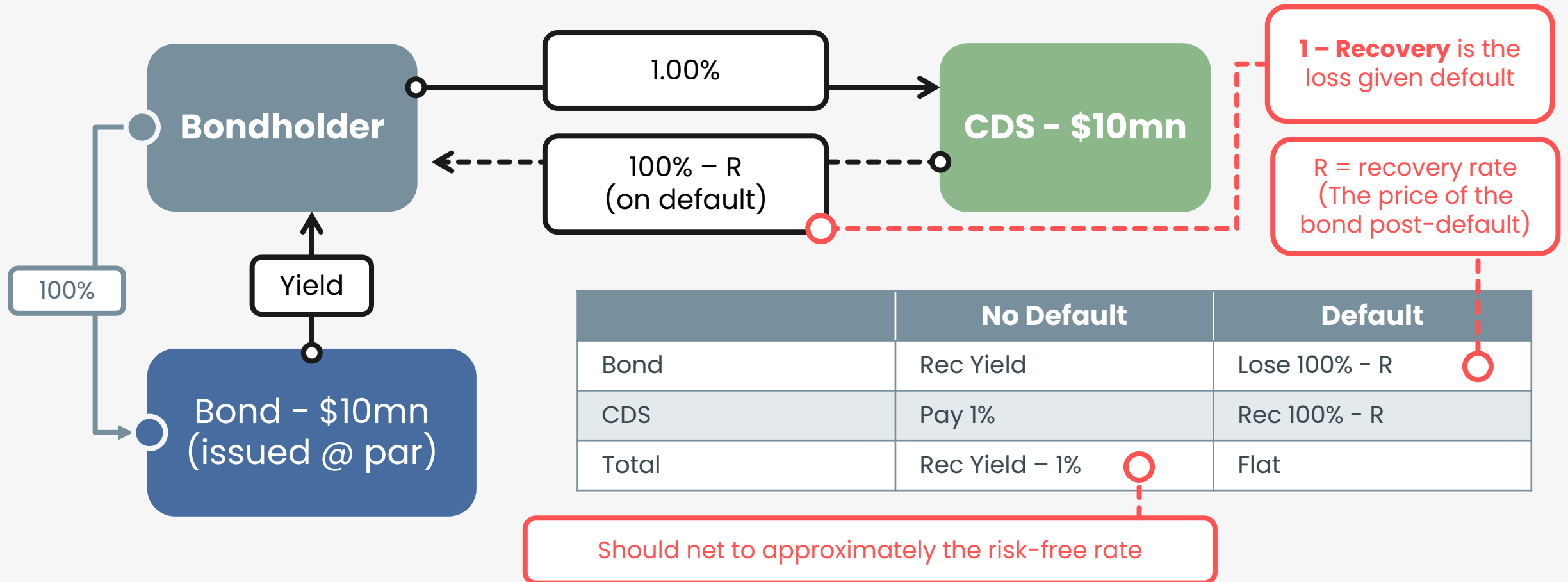


CDS trade specifications:

Notional	Maturity	Reference Entity	Reference Obligation	Credit Event	Premium
Calculation basis for CDS premium as well as for cash settlement	For how long is the credit risk transferred?	Precise identification of underlying credit	Precise identification of underlying seniority	What constitutes as credit event?	Agreed upon regular premium payments
10,000,000 USD	5Y	Company XYZ	4% 21 May 2035 ISIN: US0000000000 Senior unsecured	Bankruptcy and failure to pay	100 bps (quarterly, ACT/360)

Insuring Against Default

CDS were designed to act as **credit insurance** for bondholders



Determining If a Credit Event Has Occurred

Several actions by the borrower may **trigger protection payment** under the terms of the **CDS, for example:**

Bankruptcy – reference entity declared bankrupt



Failure to pay / default – reference entity fails to make payment(s) when due



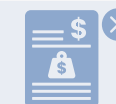
Restructuring (only some jurisdictions) – debt is altered negatively for lender



Repudiation – reference entity refuses to recognize debt



Moratorium – reference entity pauses payments on debt



Calculating the Recovery Rate

When a bondholder suffers a default, their **loss is instant**

It is the difference between the **price they paid** for the bond, and its **new price post-default**

Loss

=

Initial bond price

–

post-default price

The post-default price will be the market's **expectation of the future recovery rate**

Therefore, the payment on the protection leg of a CDS is a function of the **market-implied recovery rate** after a credit event

Determined by an **auction of the relevant bonds**

Credit event
determined



Auction held
to establish
market price



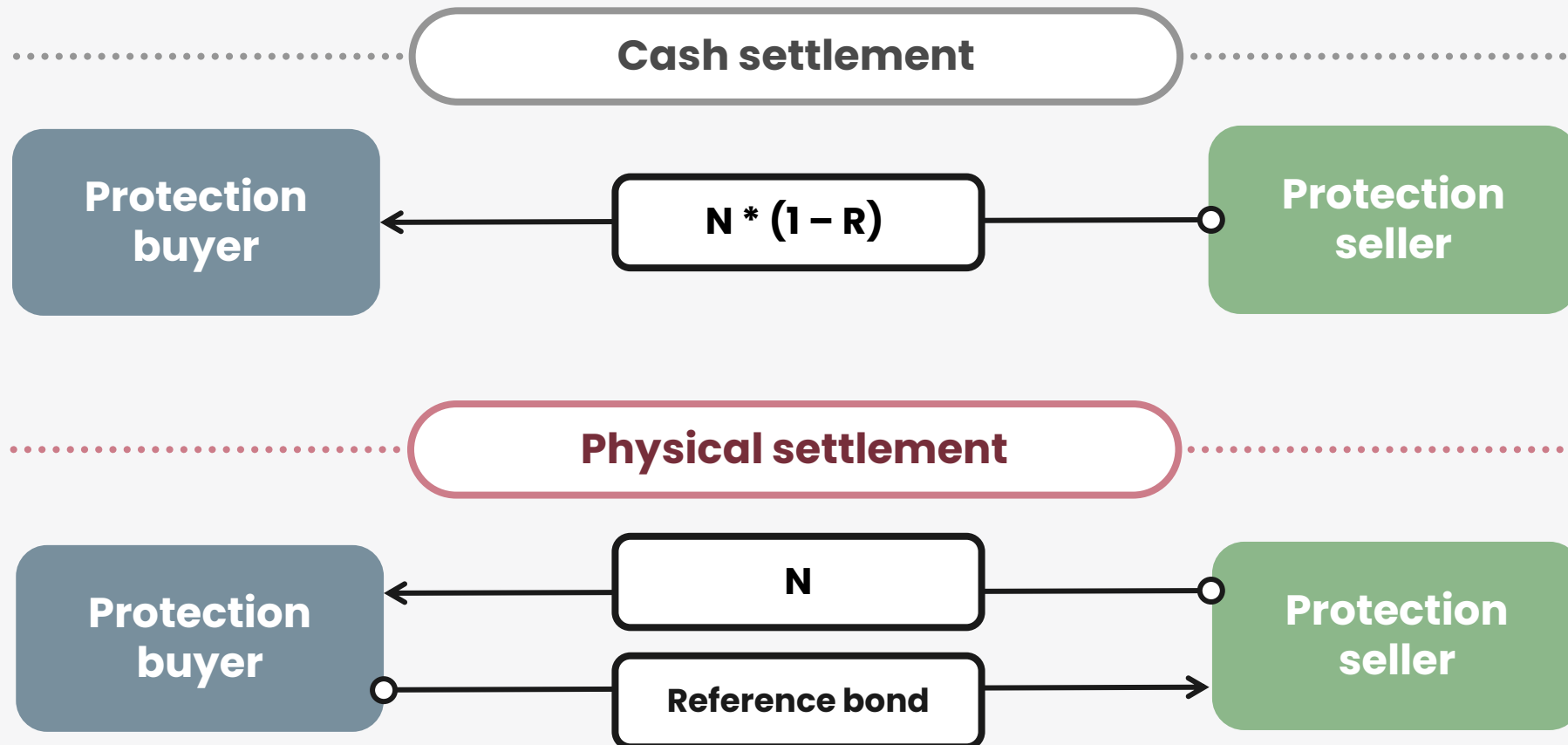
Recovery rate
determined



CDS contracts
settled

Settlement Style

Credit default swaps can **cash-** or **physically-settle** the default leg



Is there any **economic difference** between **cash** and **physical settlement**?

Who would want **each one**?



Central Clearing for CDS

During the **Financial Crisis of 2007–09**, it became obvious that **bilateral CDS** trading had a **flaw**

What if the default of the reference entity was **correlated** with the **default of your counterparty**?

e.g. **Lehman Brothers protection** offered by **Bear Stearns**

The market moved to a **centrally cleared** approach to trading, like with exchange-traded derivatives



This requires **standardized contracts**

Standardized Contracts



Standardized contracts allow for:

Easier clearing

Easier netting and trade compression

Easier unwinding of trades and crystallising of P/L



Standardized terms include:

IMM dated **standard maturities** and **premium payments**

Coupons – **100 bps and 500 bps most popular**

Credit event language

Recovery assumptions for pricing and **margin**ing



Standardized contracts examples:

SNAC – Standard North American Corporate Contract

STEC – Standard European Corporate Contract

STAC – Standard Australian Corporate Contract

CDS Upfront Amounts

CDS trades follow a standard coupon schedule with payments made quarterly on the 20th of March, June, September, and December. The first full coupon is paid in full, irrespective of the trade date

An upfront amount is typically paid at the start of the trade and is usually determined using the ISDA CDS Standard Model

Upfront payment/upfront PV

Compensation for protection buyer (seller) if fair premium is below (above) quoted coupon to align standard coupon with actual market premium

Accrued premium

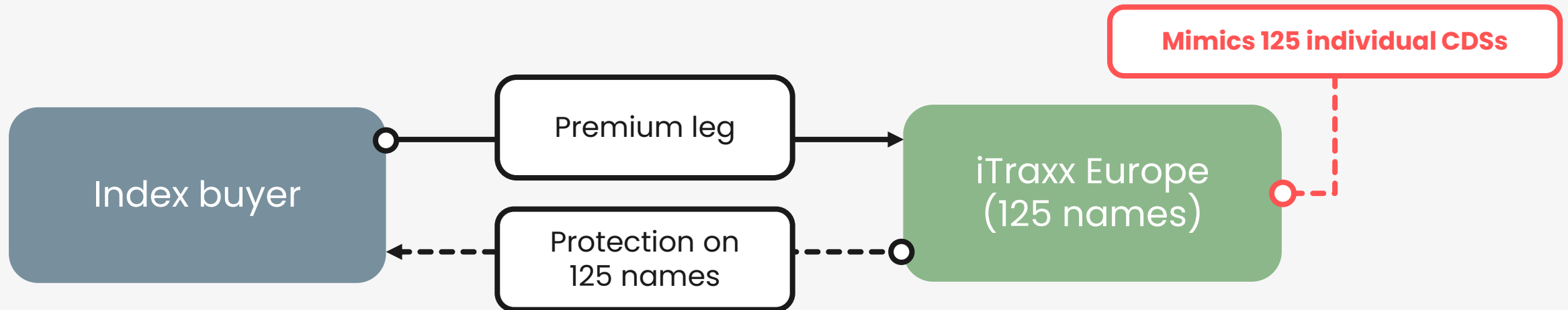
Accrued premium paid from protection seller to protection buyer for the time between the previous (hypothetical) coupon date and trade date

CDS Indexes

Credit indexes have been developed to allow for the **trading** of broad combinations of CDSs

The most popular are **iTraxx** and **CDX**

They work like a **basket of individual CDS swaps**



For example, buying iTraxx Europe in **€125mn** buys protection in **€1mn on 125 names**

Credit Index Default Process

Default is **processed** in the same way as for a **single-name CDS**

Before default

Index buyer

€125mn * coupon

Protection on 125 names

iTraxx Europe
(125 names)

One name defaults

Index buyer

€1mn * (1 - R)

iTraxx Europe
(125 names)

Continuation position

Index buyer

€124mn * coupon

Protection on **124** names

iTraxx Europe
(125 names)

The background of the slide is a grayscale photograph of a city skyline, featuring several prominent skyscrapers. The One World Trade Center is the most prominent building on the right side, reaching towards the top of the frame. Other buildings of varying heights and architectural styles fill the rest of the skyline. The sky is a uniform light gray. The logo 'FINANCIAL EDGE' is centered in the upper half of the image. 'FINANCIAL' is in a thin, all-caps sans-serif font, while 'EDGE' is in a bold, all-caps sans-serif font. A small, stylized graphic of a building corner is positioned to the right of the 'E' in 'EDGE'.

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