Guide to Day Count Conventions and Interest Payments

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Interest

Interest payments are calculated by,

$$\text{Interest} = \frac{\text{P} \times \text{R} \times \text{Days}}{\text{Denominator}}$$

Where,

$$\text{P} = \text{Principal amount}, \text{R} = \text{Interest rate in \% p.a.}$$

Days and Denominator vary across day counting conventions. The ratio $\frac{\text{Days}}{\text{Denominator}}$ can also be called the Year Fraction, the fraction of the year covered by the accrual period, which scales the per annum interest. e.g. interest of 5% per annum for ½ year, has

$$\text{YF} = \frac{1}{2}, \text{ and Interest} = \text{P} \times 5\% \times \frac{1}{2}$$

Day count conventions

ACT/360

Typically used in USD/EUR/CHF money markets and repo.

- Day count = Actual day count
- Denominator = 360 (Fixed)

Example:

Leap: 15 Dec 2023 to 15 Mar 2024 → 91 days

$$\text{Interest} = \frac{(100M \times 5\% \times 91)}{360} = 1{,}263{,}888.89$$

Non-leap: 15 Dec 2024 to 15 Mar 2025 →90 Days

$$\text{Interest} = \frac{(100M \times 5\% \times 90)}{360} = 1{,}250{,}000.00$$

ACT/365 Fixed

Most common in GBP/JPY Money Markets, most non-US/EU Gov. Bonds.

- Day count = Actual day count
- Denominator = 365 (Fixed)

Example:

Leap: 15 Dec 2023 to 15 Mar 2024 → 91 days

$$\text{Interest} = \frac{100\text{M} \times 5\% \times 91}{365} = 1{,}246{,}575.34$$

Non-leap: 15 Dec 2024 to 15 Mar 2025 →90 Days

$$\text{Interest} = \frac{100M \times 5\% \times 90}{365} = 1{,}232{,}876.71$$

For the same period, ACT/365 interest is $\approx 98.6\%$ (slightly less) of owed ACT/360 interest. ($\frac{360}{365} \approx 0.986$)

ACT/365L

Usually seen in GBP FRN's.

- Day count = Actual
- Denominator depends on coupon frequency,
    - Annual: Denominator = 366 if 29 Feb falls within the period (excluding start date) else 365
    - Non-Annual: Denominator = 366 if period end is in a leap year, else 365.

Example:

Leap: 15 Dec 2023 to 15 Mar 2024 → 91 days

D2 = 15 March 2024, leap year → Denominator = 366

$$\text{Interest} = \frac{100\text{M} \times 5\% \times 91}{366} = 1{,}243{,}169.40$$

Non-leap: 15 Dec 2024 to 15 Mar 2025 →90 Days

D2 = 15 March 2025, not in leap year → denominator = 365

$$\text{Interest} = \frac{100\text{M} \times 5\% \times 90}{365} = 1{,}232{,}876.71$$

ACT/ACT (ISDA)

Commonly used in US treasuries and long-dated derivatives.

- Day count = actual day count split by year
- Denominator = actual days in the year (366 for leap years otherwise 365)

For trades with a leap year component, the interest calculation is split into the constituent parts.

Example:

Leap: 15 Dec 2023 to 15 Mar 2024

Split:

- 2023: 16 days, denominator = 365
- 2024: 75 days, denominator = 366

Calculate the interest for each constituent year,

$$I_{23} = \frac{100M \times 5\% \times 16}{365} = 219{,}178.08$$

$$I_{24} = \frac{100M \times 5\% \times 75}{366} = 1{,}024{,}590.16$$

$$\text{Interest} = I_{23} + I_{24} = 1{,}243{,}768.25$$

Non-leap: 15 Dec 2024 to 15 Mar 2025

Split:

- 2024: 16 days, denominator = 366
- 2025: 74 days, denominator = 365

$$I_{24} = \frac{100M \times 5\% \times 16}{366} = 218{,}579.24$$

$$I_{25} = \frac{100M \times 5\% \times 74}{365} = 1{,}013{,}698.63$$

$$\text{Interest} = I_{24} + I_{25} = 1{,}232{,}277.87$$

ACT/ACT splits the accrual period at the calendar year boundary, dividng each portion by its own year's actual length (365 or 366). Alternatively, ACT/365L uses a single denominator for the whole period, choosing 365 or 366 by rule based on coupon frequency and where the leap day falls.

Note: A separate variant, ACT/ACT ICMA, is used for most European government bonds (Bunds, OATs, BTPs, Gilts). ICMA divides actual days by (frequency × actual days in the reference coupon period), which produces exactly 1/Frequency of a year for every regular coupon period. Because it requires knowledge of the bond's coupon schedule, it is not covered in detail here.

30/360 Day Count Formula

All 30/360 conventions assume each month to have 30 days, and a 360-day year. The base day count formula is:

$$\text{Days} = (Y_2 - Y_1) \times 360 + (M_2 - M_1) \times 30 + (D_2 - D_1)$$

Conventions differ in how D1 and D2 are adjusted, before applying the formula.

US Bond basis

Typically used in US corporate bonds, municipal bonds; seen as collateral in USD Repo.

- Adjustment rules (in order)
  - $D_1 = \min(D_1, 30)$
  - If $D_2 = 31$ **and** $D1 \geq 30$, set $D_2 = 30$

Example:

Period: 15 Jan 2026 – 31 Jan 2026

$$\text{Days} = (2026 - 2026) \times 360 + (1 - 1) \times 30 + (31 - 15) = 16$$

$$\text{Interest} = \frac{100M \times 5\% \times 16}{360} = 222{,}222.22$$

30E/360

Typically used in Eurobonds and european corporate bonds; seen as collateral in EUR Repo.

- If D1 = 31 → set to 30
- If D2 = 31 → set to 30

Also known as the Eurobond basis.

Example:

Period: 15 Jan 2026 – 31 Jan 2026

(Adjusted Equivalent: 15 Jan 2026 – 30 Jan 2026)

$$\text{Days} = (2026 - 2026) \times 360 + (1 - 1) \times 30 + (30 - 15) = 15$$

$$\text{Interest} = \frac{100M \times 5\% \times 15}{360} = 208{,}333.33$$

The two conventions only diverge when exactly one of the dates is the 31st. This arises due the US basis allowing months to end on the 31st. As seen in the example, a period of 15 Jan to 31 Jan would have 16 days according to the Bond Basis convention, whereas the 30E/360 snaps the maturity date to 30 Jan, and gives 15 days.

This produces a small quirk, for two “equivalent”, end of month February trades, the one starting Feb 29th has one less accrual day vs one starting Feb 28th (Non-leap year) according to the day count formula.

30E/360 ISDA

Rarely used outside specific OTC derivatives.

Adjustment Rules:

- If D1 = 31 or D1 is last day of Feb
    - Set D1 = 30
    - Otherwise D1 = D1
- If D2 = 31 or D2 is last day of Feb but not the maturity date (e.g. coupon payment) (if maturity on Feb28/29 then D2 = 28/29 respectively)
    - Set D2 to 30
    - Otherwise D2 =D2

Differences Across Conventions

Convention	Days Basis	Denominator	Special Handling
ACT/360	Actual	360	None
ACT/365 Fixed	Actual	365	Fixed year
ACT/ACT ISDA	Actual	Split by year	Sum of constituents
ACT/365L	Actual	365 or 366	Leap day
30/360 US	30-day months	360	US adjustments
30E/360	30-day months	360	31 snapped to 30
30E/360 ISDA	30-day months	360	EOM handling

Date ordering

Given a value date, maturity date and payment frequency, construct a schedule of intermediate payment dates. There are two approaches:

Forward generation

Start from the value date, step forward at the specified frequency. The leftover period becomes the back stub and is paid at the end.

Back generation

Start from maturity date and step backwards at the specified frequency. The leftover period becomes the front stub and is paid at the start.

Example:

29 Jan - Aug 15 (Non-Leap)

Period	Forward Generation	Back Generation
1	29 Jan – 28 Feb (Feb has no 29th → adjusted)	29 Jan – 15 Feb (Front Stub)
2	28 Feb – 29 Mar (rolls back to scheduled 29th)	15 Feb – 15 Mar
3	29 Mar – 29 Apr	15 Mar – 15 Apr
4	29 Apr – 29 May	15 Apr – 15 May
5	29 May – 29 June	15 May – 15 June
6	29 June – 29 July	15 June – 15 July
7	29 July – 15 Aug (Back Stub)	15 July – 15 Aug

Date rolling

Date rolling answers the question: What do I do when the scheduled payment date lands on a non-business day?

- Following
  - Push it forward to the next possible business day.
- Modified following
  - Push it forward to the next possible business day,
  - UNLESS: the next business day is a new month, then roll it back to the previous business day.
- Previous
  - Roll the date back to the previous business day.
- Modified previous
  - Roll the date back to the previous business day.
  - UNLESS: the previous business day is in the previous month, then roll it forward to the next business day