This image shows the Conservative LTV (Loan-to-Value) calculation logic used at Barclays for different loan types and collateral structures. It outlines five cases—each representing a unique combination of lien positions and fallback usage when computing how much collateral (Appraisal Value or AV) is available to back a loan.

Here's a breakdown in words:

Case 1 – Pure Lien 1

- Loan type: Only backed by Lien 1 assets.
- Collateral: All collaterals are clearly marked as Lien 1.
- Lien 1 Debt Estimation: Take the actual outstanding debt of each loan.
- Allocated AV Calculation: Use proportional allocation: \left(\frac{\text{Loan Debt}}{\sum \text{Debt across all Lien 1 loans exposed to that collateral}}\right) \times \text{Gross AV of Asset}
- LTV Calculation: \text{Loan Debt} / \text{Allocated AV}
- Fallback Used: No

Case 2A – Pure Lien >1 (With Known Lien 1 Exposure)

- Loan type: Only backed by Lien > 1 assets.
- Collateral: Lien > 1 assets are shared with other Lien 1 loans.
- Lien 1 Debt Estimation: Sum of actual known Lien 1 loans tied to the shared collaterals.
- Allocated AV Calculation: \text{Total AV} - \text{AV attributed to known Lien 1 loans}
- LTV Calculation: \text{Loan Debt} / \text{Allocated AV}
- Fallback Used: No

Case 2B – Pure Lien >1 (Missing Lien 1 Data)

- Loan type: Only backed by Lien > 1 assets.

- Collateral: No Lien 1 mapping found (Lien 1 data missing).
- Lien 1 Debt Estimation: Use fallback LTV (derived from similar collaterals by province and type) and multiply by Gross AV.
- Allocated AV Calculation:
  \text{Total AV} - \text{Estimated Lien 1 Debt (via Fallback)}
- LTV Calculation: \text{Loan Debt} / \text{Allocated AV}
- Fallback Used: Yes

Case 3A – Mixed Lien (Lien 1 + Lien >1, Known Exposure)

- Loan type: Backed by both Lien 1 and Lien > 1 assets.
- Collateral: Lien > 1 assets are shared with known Lien 1 loans.
- Lien 1 Debt Estimation: Use actual Lien 1 debt from dataset.
- Allocated AV Calculation:

    - Use proportional allocation for Lien 1,
    - Use 2A logic for Lien > 1.
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- LTV Calculation: \text{Loan Debt} / \text{Allocated AV}
- Fallback Used: No

Case 3B – Mixed Lien (Lien 1 + Lien >1, Partially Missing Exposure)

- Loan type: Backed by both, but some Lien > 1 assets have no Lien 1 mapping.
- Collateral: Partially missing Lien 1 info for shared assets.
- Lien 1 Debt Estimation: Use fallback method like in 2B for assets with no mapping.
- Allocated AV Calculation:
    - Combine known allocation (2A logic) + fallback AV estimation.
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- LTV Calculation: \text{Loan Debt} / \text{Allocated AV}
- Fallback Used: Yes (Partially)

Summary of What This Logic Achieves:

- It ensures conservative LTV estimation by:
    - Fully accounting for all loans using the same collateral.
    - Prioritizing Lien 1 obligations before calculating available AV for Lien > 1.
    - Using fallback logic only when unavoidable, based on comparable data.
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Let me know if you want a visual flowchart or how to implement this in code.

In the context of this LTV calculation logic, fallback refers to a backup method used to estimate Lien 1 debt exposure when the actual data is missing or unavailable.

Why is fallback needed?

When calculating Loan-to-Value (LTV), we need to understand:

- How much of a collateral's value is already committed to other (Lien 1) loans, so we don't "double count" it for Lien > 1 loans.
- If we can't find any Lien 1 loans associated with a collateral (i.e., no direct mapping in the dataset), we can't estimate how much value is already taken.

That's when fallback logic is used.

How does fallback work here?

Fallback uses a proxy value:

- It looks at comparable collaterals (same province and collateral type) where actual Lien 1 loans are known.

- It calculates the average Lien 1 LTV in those comparable cases:
  \text{Fallback LTV} = \frac{\text{Total Debt}}{\text{Gross Appraisal Value}} \text{ (across similar assets)}
- Then, it applies this fallback LTV to estimate how much of the current collateral's AV would likely have been consumed by a Lien 1 loan.

Example

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Suppose a collateral in Gujarat, of type "Land", has no known Lien 1 mapping.

If from other "Land" assets in Gujarat we know that Lien 1 typically consumes 40% of the value, and this collateral has a Gross AV of 10 Cr, we estimate:

\text{Estimated Lien 1 Debt} = 40\% \times 10 \text{ Cr} = 4 \text{ Cr}

This estimated 4 Cr is subtracted before calculating LTV for the current Lien > 1 loan.

When is fallback used?

- Pure Lien > 1 loans with no Lien 1 mapping at all → Fallback is fully used (Case 2B)
- Mixed Lien loans where some assets have missing Lien 1 mapping → Fallback is partially used (Case 3B)

Would you like me to show fallback logic in Python code or a diagram?