**SLIDE 8**

If I were to sum up the methodology in one sentence, it would be: we go from CMAs to Factors to Assets to Optimization.

1. De-smoothing of Asset Class Returns:

* The process begins with de-smoothing asset class returns using a proprietary methodology.
* This step removes biases and distortions in the data, providing a clearer picture of the “true economic returns” of all asset classes.
* This helps us in understanding the actual performance of assets, free from artificial influences.

1. Decomposition into Core Drivers:

* The methodology then decomposes these true economic returns into core drivers that influence factor returns.
* This is a two-step process that I'll talk about in a few minutes in some more detail.
* This involves identifying the fundamental components that drive the returns and risks of individual factors and consequently, assets.
* It provides a detailed understanding of what does and does not influence each factor, allowing for a more precise projection of future returns.

1. Integration of Externally-Provided Capital Market Assumptions (CMAs):

* The use of PNCI's CMAs helps in enhancing the projection process.
* These CMAs, combined with the core drivers from above, allow for a comprehensive projection of both expected returns and associated risks for various factors.
* This step ensures that the projections are grounded in current market assumptions and expectations of risk, returns, and correlations of various asset classes.

1. Derivation of Expected Returns and Standard Deviations:

* The projected factor risks and returns are then used to derive expected returns and standard deviations for individual assets.
* This provides detailed risk-return profiles for each asset, which are essential for making informed investment decisions.
* As mentioned earlier, **we go from CMAs to Factors to Assets**.

1. Optimization and Harmonized Asset Allocation:

* The final step involves optimizing the expected risk and return metrics to achieve a harmonized asset allocation.
* The optimization process ensures that the asset allocation is efficient, balancing both alternative and public market securities to achieve the desired investment goals.
* This step leverages financial econometrics and machine learning to refine the allocation strategy, ensuring it is robust and adaptable to changing market conditions.
* And so **we go from CMAs to Factors to Assets to Optimization**.

**SLIDE 9**

So let’s talk a little bit about the methodology so you know what you’re getting.

INPUTS:

* The methodology starts with historical returns data for a range of asset classes.
  + This data serves as a foundation for understanding past performance and trends, providing a basis for projecting future returns.
* Alongside historical data, PNCI’s Capital Market Assumptions (CMAs) are incorporated.
  + These assumptions include expected returns, volatilities for each asset class, and their respective correlations.
* CMAs are crucial for grounding the projections in current and expected market realities.

**Customization and Case Study:**

* In the case study which I’ll talk about in a few minutes, PNCI’s CMAs have been utilized.
  + This highlights the flexibility of the methodology in incorporating different sets of assumptions, depending on the client’s requirements and available data.

REFINEMENT TO CORE DRIVERS:

* WHAT ARE CORE DRIVERS?
  + Core drivers are fundamental factors or variables that primarily influence the behavior of the asset classes.
  + This step may include statistical methods like factor analysis, principal component analysis, and (later) machine learning techniques to identify these core influences.
* IDENTIFICATION OF LATENT DRIVERS:
  + The refinement process is thorough and includes the potential identification of latent (unseen) drivers, if they exist.
  + These latent drivers might not be immediately apparent but can have significant impacts on asset returns and risks.
    - Identifying these drivers can provide deeper insights into the underlying forces affecting the market.

**SLIDE 10**

Moving on. As I mentioned earlier, the refinement is a two-step process.

* We use advanced machine learning techniques in our proprietary methodology to further refine the set of core drivers.
  + This step involves filtering the initially identified drivers down to a more concentrated subset that has the most significant impact on factor (and therefore, fund) return projections.
* The refinement process narrows down the core drivers to a final set of (say) 5 core drivers, from the original number which is usually much larger (19, in our case).
  + These selected drivers are the most relevant factors influencing the returns, ensuring that the analysis focuses on the most impactful variables.
* **And so, we go from CMAs, to Factors, to Assets to Optimization.**
* Once we identify the core drivers, we then project out factor returns.
* To get asset-level returns we use our Global Multi-Asset Model which is in its third version currently.
* Using GMAM:
  + Global Multi-Asset Model:
    - These factor expected returns are incorporated into our Global Multi-Asset Model, which calculates the exposures of different assets to these factors.
    - This comprehensive model integrates the various factors to provide a holistic view of the expected returns for each asset.
* The final output is the expected return distribution for each individual asset.
* This detailed information helps in constructing portfolios that align with the investor’s goals.

**SLIDE 11**

Let’s move on to our Case Study, which uses PNCI CMAs for asset return projections.

**SLIDE 12**

In our analysis, we focus on using PNCI’s Capital Market Assumptions (CMAs) to derive our factor projections.

* By incorporating PNCI’s CMAs, which detail expected returns, standard deviations, and correlations for various asset classes, we:
  + ensure that our projections are closely aligned with PNCI’s market outlook and risk preferences.
  + create projections that are specifically tailored to PNCI’s investment strategies and objectives.
  + can identify key factors that influence portfolio performance, ensuring our strategies are well-suited to meet your expectations.

Overall, integrating PNCI’s CMAs into our analysis ensures that our work is directly relevant to their needs and grounded in their unique perspective on the market.

**SLIDE 13**

Let’s start with the projected factor returns.

1. **Variation in Projected Returns**: The projected returns vary significantly across the factors, from a high of 13.36% for “Alt Trend” to -7.62% for “Alt HF Crowding.”
   * This indicates differing outlooks and potential strategies among the factors.
2. **Negative Returns**: Notably, “US Dollar” and “Alt HF Crowding” have negative projected returns, indicating an expected decline in value.

* This could be due to anticipated unfavorable market conditions or specific strategic considerations for these factors.

**Diversification Insights**:

* The diversity in projected returns suggests that these factors represent a broad range of investment opportunities and risks.
* Investors might consider using this information to balance their portfolios, considering the potential returns and the associated risks (as indicated by our projected risk estimates – which are coming soon).

**SLIDE 14**

Let’s look at some asset-level return projections derived from PNCI CMAs.

**SLIDE 15**

* Here, we have a multi-strategy fund’s projected return distribution.
  + The projected mean (5.28 – red dashed line) is slightly higher than the historical mean (4.63 – green dashed line). This suggestsan optimistic outlook for the fund’s future performance compared to its historical average.
  + The distribution appears slightly skewed to the right, indicating that while most projected returns cluster around the mean, there is a small probability of achieving higher returns, extending beyond the historical range.
  + The projected standard deviation (0.86) offers an indication of expected volatility around the projected mean. Given the relatively narrow spread, it suggests that the fund’s returns are anticipated to be consistent, with limited extreme deviations.
* Overall, the data suggests a positive projection relative to historical performance, potentially indicating a more favorable economic outlook or changes in fund management strategies.

**SLIDE 16**

* Next, we have a private credit fund’s projected return distribution.
  1. The projected mean return is 4.56, slightly lower than the historical mean of 5.11. This difference, highlighted by the red (projected) and green (historical) dashed lines, suggests a more conservative outlook for future performance compared to past returns.
     + The histogram also appears to be bimodal, with two peaks, one around 7% and the other around 2%, indicating higher probabilities of one of those returns occurring.
  2. The projected standard deviation is 2.48, indicating a relatively wide spread around the projected mean. This suggests a high level of volatility and uncertainty in the projected returns.
  3. This histogram like the previous one, is also right-skewed, with positive returns going out to above 12%. However, there are also noticeable frequencies of returns extending into the negative, indicating potential downside risks.
  4. The fact that the projected mean is lower than the historical mean may suggest a less favorable economic environment or changes in the fund’s risk profile.

**SLIDE 17**

* And finally, we have a private credit fund’s projected return distribution.
  1. The projected mean return is 9.79, slightly lower than the historical mean of 10.42, as indicated by the red (projected) and green (historical) dashed lines. This suggests a slight decrease in expected future returns compared to past performance.
  2. The projected standard deviation is 1.13, indicating moderate variability around the projected mean. This level of standard deviation suggests that while the majority of projected returns are clustered around the mean, there is still a reasonable spread indicating some level of volatility.
  3. The distribution is slightly right-skewed, with a noticeable tail extending towards higher returns. This skewness indicates the possibility of achieving significantly higher returns, though less frequently.
  4. The projected mean being lower than the historical mean could suggest a conservative outlook for the fund’s future performance, possibly due to changes in market conditions or fund strategy.

**SLIDE 18**

**Reconciliation of Research and Production Proof of Concept:**

1. **Finalizing Reconciliation**:

* The team is currently finalizing the reconciliation between the Research Proof of Concept (RPOC) and the Production Proof of Concept (PPOC).
* This crucial step serves two purposes:
  1. It ensures that the theoretical models and research findings are effectively translated into practical, actionable strategies that can be implemented in a real-world setting.
  2. It provides an opportunity for a secondary evaluation, serving as a vital check and balance mechanism.

**Production Code:**

* The next step will be to take the PPOC and convert it to production-level code, which will then be integrated into the ex-ante optimization process.
* This forward-looking optimization aims to create efficient asset allocations by balancing alternative assets and public securities, ensuring that the portfolios are not only diversified but also optimized for the best possible risk-adjusted returns.
* The final step will be to integrate the optimization results into our Unified Analytical Framework, or UAF.
  + The UAF assesses the value of assets and portfolios to advisors and clients balancing expected return, risk, and liquidity considerations (stay tuned for more on this!).