



External Data for Wholesale Loss Forecasting

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Model Taxonomy

- Model taxonomy supports the use of external data and models
- **Champion** is the basis for wholesale loss forecasts that inform capital adequacy
 - Model complexity appropriate to the materiality of the portfolio
- **Challenger** provides alternative perspective, insurance against champion model limitations, and informs overlays
 - Data and technique independent of the champion model maximize alternative perspective
- **Benchmark** support results with alternative loss forecasts
 - Simpler models lacking sophistication appropriate for the materiality of the portfolio
 - Provide a different or broader perspective
 - Generally lower approval standards

Challenger model objectives motivate the need for alternative data, but expectations remain high





Benefits of External Data

- Challenger decision is not internal versus external, but how well does the proposed approach offset champion model weaknesses
- Challenger objectives – alternate perspective, insurance against limitations, and methodological exploration
- Independent information – alternate data and/or methods – maximize challenge value
 - “Hedge” to internal alternatives – methodological and data limitations
 - External data often support alternative techniques – providing additional business support
- Various sources can satisfy external data needs but each have pros and cons

External data provide strong alternative perspective, but have limitations



Sources of External Data

- Various sources of external data exist to support Wholesale stress testing
 - **Consortium and Vended Public Data**
 - Pros: Generally long history with detailed financial data
 - Cons: Requires rigorous defense to support applicability
 - **Regulatory Reporting**
 - Pros: Long history aggregated across peer banks
 - Cons: Lacks sufficient portfolio details
- External data sources have relative advantages and limitations – ultimate selection should be informed by the champion limitations
- Mitigation of data limitations is required for a successful model

No “correct” external data source – each has benefits and limitations

Pre-profiling of External Data

- Established internal expectations to evaluate external data **BEFORE** the engagement
 - Outline expectations of data representativeness, comprehensiveness, and quality
 - Vendor standing in the industry and SME's view of external data relevance
 - Determine data ownership, internal or third-party, as support for validation
 - Lack of ownership restricts development and validation capabilities – Can model validation replicate?
 - Detail all data benchmarking that can support external data
 - Proving applicability and identifying limitations through benchmarking improves the outcome

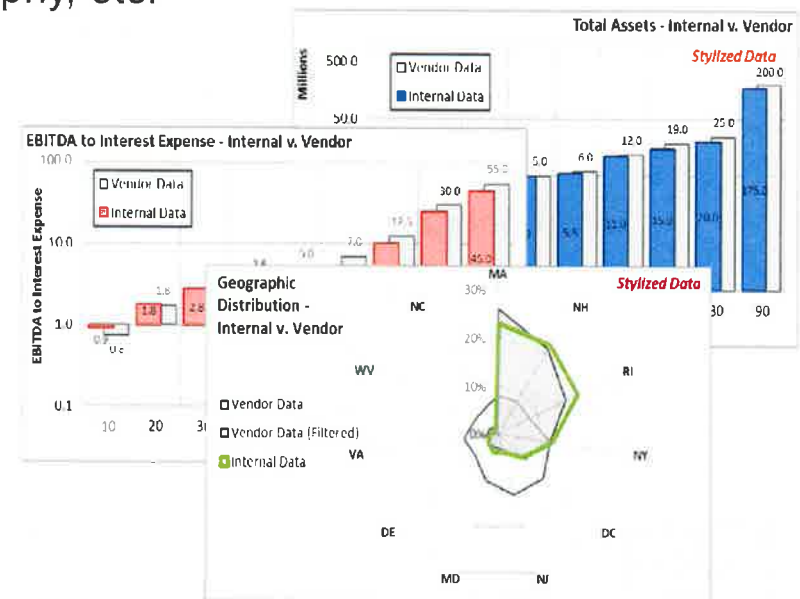


Pre-engagement due diligence mitigates future challenges



Analytical Evaluation of External Data

- Create analytical support to assess relevance and comprehensiveness of data
 - **Applicability** – measure external data’s relevance to the portfolio
 - **Comprehensive** – measure data’s ability to model the entire portfolio
 - Sufficient default and loss set and availability through economic cycle(s)?
- Compare key metrics – verify external data span portfolio and key metrics are similar
 - Distribution by industry, property type, geography, etc.
 - Key underwriting and risk ratios
- Filtrations maximize similarity between external data and portfolio
- Statistical comparisons (e.g., Information Value & Chi-Squared) are helpful, but SME buy-in is required.



Analytical methods evaluate data applicability and comprehensiveness



SME Evaluation of External Data

- Engage SMEs to evaluate external data and key metrics
 - Provide business intuition and experience not easily replicated in analytical analyses
- Require SME guidance and approval for key data and development decisions
- SMEs contribute to external data review through:
 - Support for provider selection – is the vendor a recognized expert?
 - Selection key risk measure comparisons – what metrics define the portfolio?
 - Evaluation of data – SMEs review key risk measures and results
- Applicability concerns may not be fully resolved
 - calibrate for persistent limitations
 - Share assumptions and limitations with governance process

SME evaluation defines success – calibration for remaining limitations



Champion/Challenger Criterion

- Champion/Challenger decision is comprehensive to key modeling considerations
 - Data considerations – Representativeness, Comprehensiveness, and Quality
 - Management and SMEs review and compare consideration ratings between models

Consideration	Evaluation	Internal Data Model	External Data Model
Data Representativeness	<i>Which of internal and external data is more representative of the portfolio today</i>	A	B
Data Comprehensiveness	<i>Which of internal and external data captures more economic cycles</i>	B	B
Data Quality	<i>Which of internal and external data is more consistent and reliable throughout history</i>	C	B

- Evaluations are judgmental and no formal weights are provided
- Model considerations complete the champion/challenger selection process

Comprehensive evaluation, of data and approach, determine model role



Conclusions

- External data offer independent challenge to internal approaches – multi-cycle data that support alternative approaches
- Expectations for challenger approaches is high – support must be comprehensive
- Comparison of key data dimensions is required and filtration is often necessary
- Use SME review to identify comparative issues hidden from analytical review
- Persistent differences require model calibration – calibration carries risks and limitations
- Senior management and portfolio SMEs should review all known limitations during model evaluation

*External data are a valuable resource, but **KNOW THE LIMITATIONS***
