



# FRB Modeling Symposium - PPNR

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June 25, 2014

# Overview

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- BB&T has developed a suite of econometric models and tools for PPNR forecasting.
  
- Categories include:
  - Major noninterest income and expense items (Insurance, BankCard, CheckCard, etc.).
  - Credit-related income and expense forecasts
  - Wholesale and retail loans and deposits
  
- Challenger models are also being developed for the most material noninterest income and expense categories.
  
- The CheckCard model was developed to forecast debit card income. This category is composed primarily of interchange income and associated fees.



# BB&T Modeling Philosophy

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- BB&T strives to build models consistent with business rationale and economic intuition.
- To achieve this goal, developers collaborate with line of business (LOB) managers to understand the fundamental drivers of revenue and expense.
- Developers also discuss data quality, availability, and relevance with LOB management to determine whether to rely upon internal data or to construct models using external data.
- LOB management provides insight into key factors that shape the modeling framework and approach:
  - Business strategy
  - Acquisitions
  - Regulation
  - Data availability
  - Strategic initiatives
  - Economic intuition

# Internal vs. External Data

## Internal Data

### Pros

Greater granularity

Enables greater segmentation

Specific to BB&T's business mix

### Cons

Adjustments for one-time events

Limited history

## External Data

### Pros

Longer data series

Limited adjustments for one-time events

Consistent data definitions

### Cons

Not specific to BB&T's characteristics

Lacks granularity

- Regulatory data for debit card revenue was not readily available prior to the first quarter of 2008, so internal data was preferred.
- Generally, internal data is preferred when available given its greater relevance to BB&T's business mix.



# Internal Data Limitations

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- Limited history
  - Internal data covered only the latest recession
    - Model responsiveness trained on retail sales activity specific to a single downturn
  
- Existing data impacted by acquisitions
  - BB&T has been acquisitive over time
    - Revenue spikes over time result in a non-stationary data series
  
- Exogenous factors influence debit card revenue
  - May require the use of event variables or model overlays



# CheckCard Background

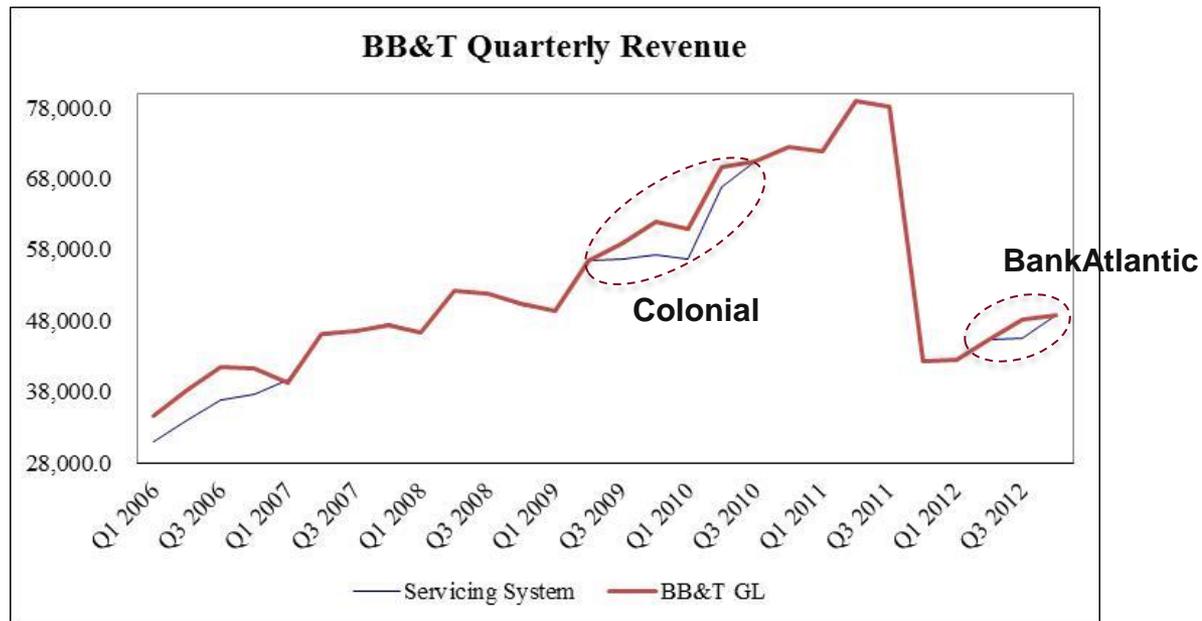
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- Historically, baseline and stress projections were developed based on management's judgment regarding the impact of indicators such as:
  - Activation
  - Penetration
  - Usage
  - Marketing initiatives, and
  - Macroeconomic scenarios
  
- As stress testing evolved, BB&T relied on its Service Charges model to provide a corroborative data point for the forecasting process.
  
- BB&T now models CheckCard income as a means of increasing transparency and repeatability. Retail sales and active debit cards are the model's primary revenue drivers.
  
- The most significant challenges for developing the model were related to internal data consistency and relevance.



# Internal Data

- BB&T began with monthly data on all debit card fees and accounts dating back to 2006.
- Differences in revenue were identified between BB&T's servicing system and GL due to acquisitions during this time period:



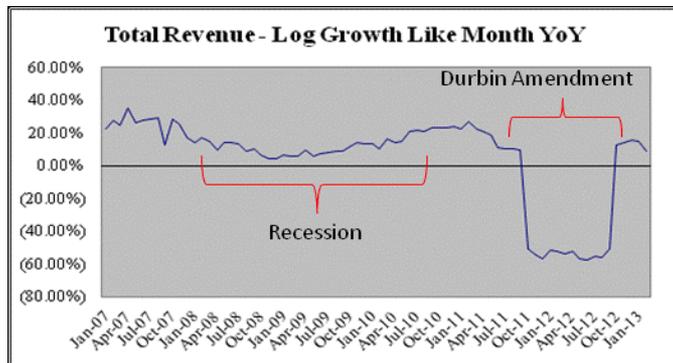
# Revenue Scaling

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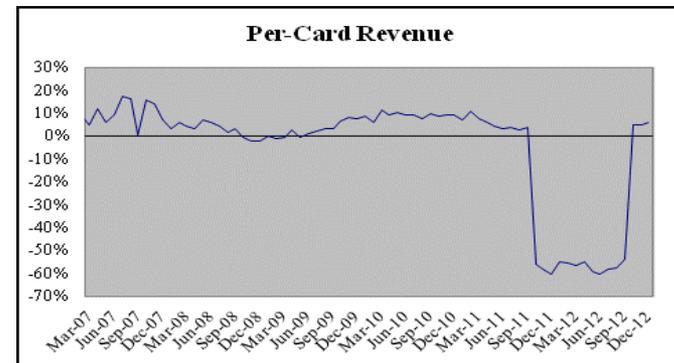
- The raw data required transformations to establish a stationary series and normalize for external factors.
- Required acquisition data were not available, so back-casting growth was not an option.
- Active accounts and debit card fees from acquisitions were maintained consistently by the LOB throughout the time series, so scaling revenues could offer a solution.
- Scaling revenue by the number of active accounts enabled management to ignore the timing in accounting for acquisitions.
  - Scaling by number of accounts properly separates the phenomena and allows the developer to project revenue with the appropriate factors.
  - These numbers were reconciled with reported numbers back to 2007.
- Event variables were also considered as a means of controlling the exogenous factors impacting the data.

# Adjusted Revenue

- By isolating the revenues on a per card basis, the impact of DDA penetration on revenues is minimized and the effect of acquisitions is neutralized.
- Adjusted growth rates average 9.6% in 2007 compared to the average 2007 unadjusted rate of 25.5%.
- Adjusted rates observed during the recession reach (2.3%), giving management confidence in the model's ability to sufficiently pressure revenues in stress scenarios.



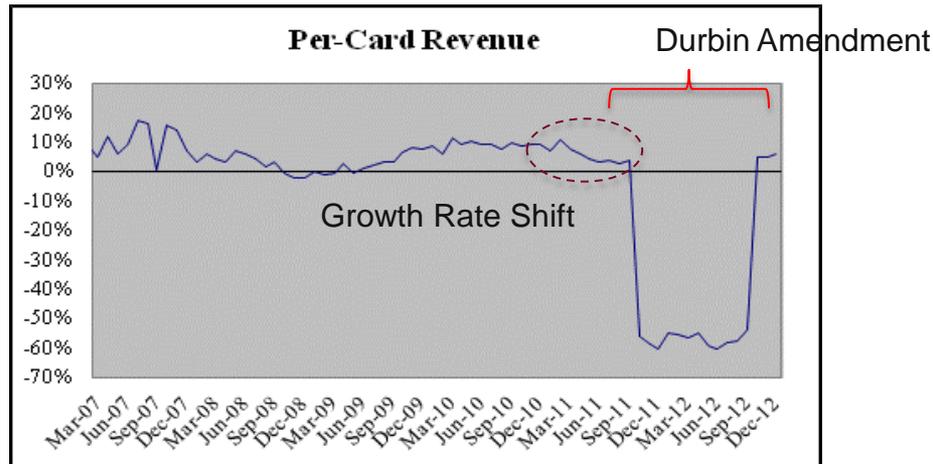
Unadjusted: 12 month log difference in debit card revenue



Adjusted: 12 month log difference in debit card revenue per total active cards

# Event Variables

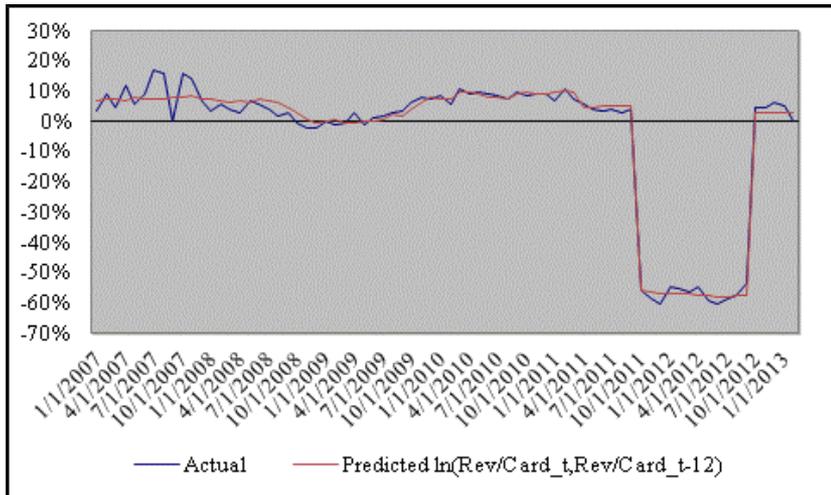
- There are two breaks in the data series that require the use of event variables.
  - The Durbin Amendment causes a clear break in revenue growth
  - There is also a break in the series resulting in lower growth rates beginning April 2011



- The growth rate shift was likely due to product maturation and pricing changes.
- Event variables were added to allow retail sales growth to drive the bulk of the changes, resulting in a more conservative forecast.

# CheckCard Model

- The model uses BB&T debit card revenue per card data to build an ordinary least squares (OLS) regression of CheckCard revenues against retail sales. We expect a positive coefficient indicating revenue improves as retail sales increase.
- Forecasted active debit cards are an input into the CheckCard model.
- The event variables improve the model's statistics and the series break results in more conservative forecasts.



Adjusted R Square 98.4%  
 Implied R Square\* 77.2%  
 Durbin Watson 1.79

	Coefficients	Standard Error	t Stat	P-value
Intercept	0.05904	0.004181772	14.1	0.000%
ln(Ret Sales_t, Ret Sales_t-12)	0.52634	0.065976612	8.0	0.000%
Durbin	(0.60878)	0.012440784	(48.9)	0.000%
Series Break	(0.05106)	0.010624426	(4.8)	0.001%

\*The implied R<sup>2</sup> represents the adjusted R<sup>2</sup> beginning in 2008 and ending prior to the series break.



# Active Debit Card Projection

- To forecast active cards, the developer worked closely with the LOB to determine appropriate drivers.
- Due to acquisitions and reporting changes, assessing correlations with macroeconomic factors was not particularly useful.
- Regional employment at a six-month lag was identified as the primary driver of card growth.
  - Economically intuitive as account openings and activity displays a lagged relationship with employment.
  - Correlation between active cards and year over year log growth rates.
- This relationship is used as the basis for growing actual active cards over the forecast horizon.

Factor	Correlation
Consumer_Credit	45.8%
6 Month Lag	34.2%
NAT_Employment	47.9%
6 Month Lag	54.3%
NAT_Labor_Force	58.3%
6 Month Lag	40.9%
REG_Employment	44.1%
6 Month Lag	56.9%
GDP_Real	11.4%
6 Month Lag	48.3%
Personal_Income	37.0%
6 Month Lag	58.2%
Disp_Income_Real_NAT	43.3%
6 Month Lag	54.7%



# Model Overlays

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- To incorporate additional exogenous factors into modeled results, BB&T applies model overlays through a formalized challenge and review process.
- The CheckCard Model provides LOB management with the initial forecast for all scenarios.
- Managers consider model limitations, characteristics of the economic environment, and their knowledge of planned business initiatives when evaluating output.
- Challenge meetings further vet modeled results and overlays.
- For cases where modeled output is inconsistent with management expectations, documentation is provided to support overlays.



# Regulatory Risk Overlay

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- During the CCAR 2014 planning process, additional uncertainty surrounded the level of interchange rates as a result of the outstanding FRB appeal of the transaction cap court ruling.
- Through discussions with senior management, BB&T felt it would be prudent to include a regulatory risk overlay to the stress scenarios where the cap on interchange income was reduced to \$0.07/transaction.
- The cap was assumed to go into effect in Q2 2014, the earliest possible effective date.
  - Baseline: \$0.21 cap per transaction
  - Stress: \$0.07 cap per transaction

# Questions?

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