Stress Testing Modeling Symposium

Residential Mortgage Modeling Issues
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Views are my own and not those of the Federal Reserve Bank of Philadelphia or Federal Reserve System

Issue 1: “Aiming for Model Robustness”

- Dynamic:
  - Can the model’s fit to historical variation in payment performance be improved?
  - **Are forward loss projections robust to alternative specifications?**
  - Is there potential over-fitting of historical relationships?
- Cross-sectional:
  - Subject to available data, does the model incorporate a complete set of portfolio risk characteristics?
  - Are the relative impacts of various risk characteristics robust to alternative specifications?

Issue 1: “Aiming for Model Robustness”

- Stress testing context implies:
  - Dynamic variables limited to those for which have scenarios
  - Variable selection should be guided by theory
  - “Less can be more”
  - Important to identify and assess impact of factors left out of model
  - Elevated model risk and diminishing returns to model specification testing

Issue 2: Loan Modifications

- Reduced-payment loan modifications were a substantial percentage of *re-performing* (cured from delinquency) loans during crisis period
  - Rough estimates based on industry data show 30 percent of cures in 2008 were reduced-payment mods, rising to 45 percent in 2009 and 40 percent in 2010
  - Most are rate reducing mods, but recently 20 to 30 percent involve principal reduction
- Payment performance of re-performing loans has improved since 2008, reflecting declining re-default among modified loans

Issue 2: Loan Modifications (Challenges)

- How relevant are historical data? (evolving loan modification strategies and re-default behavior)
- How will modified loans perform in a renewed stress environment?
- Selection effects (unobserved characteristics, such as not being burdened with a second lien)
- Incorporation of post-default modification into loss severity estimates
- Is revenue reduction associated with rate modification adequately captured in PPNR models?
- Similar issues apply to loss mitigation generally, such as to HELOC account management strategies

Issue 2: Loan Modifications (Solutions)

- Modeled relationships (as much as possible) should be well-grounded in empirical data
- Assumptions concerning future loan modification strategy, where unavoidable, should be documented
- These assumptions should be conservative

Issue 3: Second Liens as Risk Factor for First Mortgage

- Unobserved heterogeneity affects modeling first lien mortgage repayment
  - Unobserved second liens are one aspect of this
  - In securities data, combined loan-to-value ratio as of origination is generally recorded, but subsequent second-lien borrowing is not
  - In bank portfolio data, only the loan-to-value ratio of the first-lien is generally recorded

Issue 3: Second Liens as Risk Factor for First Mortgage (Problems)

- Dynamic: unexplained “burnout” effects—unobserved changes in risk composition reflected in changing rates of delinquency
- Cross-sectional: unexplained differences in default rates across banks

Issue 3: Second Liens as Risk Factor for First Mortgage (Solutions)

- Unobserved heterogeneity accounted for indirectly through baseline hazard rates and included explanatory variables or proxies such as vintage effects
- Merging consumer credit reporting data into first-lien mortgage performance data is a potential solution
  - Depends on ability to consistently match borrowers across the two databases
  - Depends on ability to distinguish the second lien among possibly mortgage accounts in the credit reporting data
  - Worth exploring as a longer-term model development effort

Issue 4: Expiring Interest-Only Periods

- Expiring interest-only periods are a potential risk factor primarily for HELOCs
  - Due to high prepayment and default rates of first-lien closed-end interest-only ARMs, relatively few remain on book

Issue 4: Expiring Interest-Only Periods (Problem)

- HELOC interest-only periods set to expire mostly beginning in 2015
- Need to rely on inferences based on best available data and expert judgment

Issue 4: Expiring Interest-Only Periods (Solutions)

- A substantial number of first-lien interest-only mortgages began amortizing in 2011; may be able to draw inferences from these
- HELOC payment reset risk may be mitigated by modification or roll-over strategies
- Again, risk quantification should be empirically based to the extent possible, and assumptions should be conservative