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:
  o Can the model’s fit to historical variation in payment performance be improved?
  o **Are forward loss projections robust to alternative specifications?**
  o Is there potential over-fitting of historical relationships?

• Cross-sectional:
  o Subject to available data, does the model incorporate a complete set of portfolio risk characteristics?
  o Are the relative impacts of various risk characteristics robust to alternative specifications?
Issue 1: “Aiming for Model Robustness”

• Stress testing context implies:
  o Dynamic variables limited to those for which have scenarios
  o Variable selection should be guided by theory
  o “Less can be more”
  o Important to identify and assess impact of factors left out of model
  o 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
  o 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
  o 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
  o Unobserved second liens are one aspect of this
  o In securities data, combined loan-to-value ratio as of origination is generally recorded, but subsequent second-lien borrowing is not
  o 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
  o Depends on ability to consistently match borrowers across the two databases
  o Depends on ability to distinguish the second lien among possibly mortgage accounts in the credit reporting data
  o 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
  o 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