Algorithms & “Big Data” (AI/ML) in Lending

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Machine Learning in Credit Decision Making

• Long employed in some areas (e.g., fraud detection)
• Now a “hot topic”
  • Touted by start-ups as technological advantage
  • Incumbent firms also playing up forays in AI and ML
  • Strong demand for ML and data science specialists
ML/Credit Startups

• Consumer
• Mortgage
• Small business
• Technology
Some Large Incumbents Highlighting AI/ML Initiatives

- Commercial banks
- Investment banks
- Credit scoring firms
Assessing Current Practice

• Techniques and methods employed
• Pervasiveness in the industry (what sorts of firms are adopting, availability of standardized products and services)
• Domains of application (e.g., consumer credit, mortgage, commercial, etc.)
• Trends and projections

Status: significant adoption claimed
• Many startup companies
• Incumbents forming AI groups and hiring ML specialists
• No hard data
Effects of ML Technology: Bias?

• Biases inherent in data sources
  • [Caliskan et al., 2017]

• Discovery of proxies for suspect classification features
  • [Netzer et al., 2016]

• Issue: How to define unwanted discrimination
Effects of the Technology on Lending Practice

• Bias (unintended) of machine-derived lending policies
  • Biases inherent in data sources
  • Discovery of proxies for suspect classification features
  • Issue: How to define *unwanted* discrimination

• Algorithmic implications
  • Changes in standard terms for issuing and revoking credit
  • Actions triggered by new categories of conditions
  • Faster reactions to observed information
  • Privacy considerations

Status: Much press discussion
- Clear demonstrations of potential problems
- Mainly hypothetical and anecdotal
- Academic work *starting* at abstract level
Implications for Financial Stability

• Correlated decision making based on common algorithms and data
• Cascading behavior based on rapid reactions to events
• Predictability of future credit allocations

Status: Some attention
• Fairly speculative at this point
Discussion Questions

• How can we measure actual scope and extent of technology adoption?
• Will pervasive AI/ML make lending policies and practices harder to understand?
• How can we identify manifestations of hypothetical concerns (e.g., bias in lending) in practice?
• What legal or technological measures may be available to regulate these implications?
  o Do algorithms present special regulatory difficulties, or opportunities?