

## **BA230M: Asset-Backed Security Markets**

Professors Christopher Palmer and Nancy Wallace  
[palmer@haas.berkeley.edu](mailto:palmer@haas.berkeley.edu) and [wallace@haas.berkeley.edu](mailto:wallace@haas.berkeley.edu)

Haas School of Business  
University of California, Berkeley  
2.0 Units (30 lecture hours)

Fall 2016

Class meets Monday/Wednesday 9:30-11:30 AM in Room F320

### **Course Overview**

This empirical course will apply the latest tools of economics and finance to provide a detailed understanding of the structure and operation of the securitized bond markets in the U.S., including what can go wrong. As one of the major innovations in U.S. capital markets, there is robust demand from a wide variety of employers for 230M graduates who intimately understand the complexities of securitization and can work with the massive datasets required thereby. Discussing 230M class projects in interviews provides an opportunity to showcase that skillset to potential employers. We will extend the study of fixed-income securities and credit risk with advanced topics on securitized lending, mortgages, and mortgage-backed securities, applying these lessons to many other asset-backed securities including asset-backed commercial paper, auto loans, credit card receivables, crowdsourced lending, equipment, third-world debt, repo, commercial leases, and energy derivatives. Of necessity, problem sets will involve developing Big Data skills to handle the massive individual-loan datasets underlying many asset-backed securities, as well as Monte Carlo simulation and option-based pricing techniques. We will consider the basic mechanics of structuring ABS deals, including how to value, trade, rate, and stress-test such securities, as well as the risk management techniques employed in both the pooling and slicing (tranching) phases of the securitization process. Finally, we consider a proposal to use medical R&D securitization to cure cancer.

## **Course Materials**

### **Required Textbooks**

Veronesi, Pietro, *Fixed Income Securities*, John Wiley & Sons, 2010.

Lakhbir Hayre, *Salomon Smith Barney Guide to Mortgage-Backed and Asset-Backed Securities*, John Wiley & Sons, 2001.

### **Reader**

Additional readings will be posted on **bcourses.berkeley.edu**

### **Course Requirements**

Course requirements include three graded problem sets, a term project, and final exam.

### **Grading**

Course grades will be determined using the following weights:

25% Term project

50% Problem sets

25% Final

### **Course Structure**

The course will meet for 2 hour classes, twice a week, for 7½ weeks (= 30 hours).

All Friday/Thursday discussion sessions are not always in the same room or at the same time.

The times and locations are shown on the syllabus.

The last two class sessions are used for student term project presentations.

### **Graduate Student Instructors**

Name	Email Address	Office Hours
David Echeverry-Perez	david_echeverry@haas.berkeley.edu	1:00-2:00 Monday
Haoyang Liu	haoyang_liu@haas.berkeley.edu	2:00-3:00 Wednesday

## Lectures, Homework Sets, and Discussion Session Dates

### Lecture 1: Introduction to Asset-Based Security Markets

**August 15 (Monday)**

Christopher Palmer & Nancy Wallace

1. Course organization
2. Unique features of asset-backed (structured) securities (ABS)
3. Review of ABS product markets

### Lecture 2: Valuation of ABS Cash Flows

**August 17 (Wednesday)**

Christopher Palmer

1. Principles of ABS Valuation
2. Tranched cash flow structures

**Homework Set 1 handed out: Due August 24:** One-factor reduced form MBS valuation

**Discussion Session 1 (Friday August 19): Review of Hull and White and MBS Valuation (F320, 2:00 – 4:00 p.m.)**

### Lecture 3: ABS Valuation and Hazard Modeling

**August 22 (Monday)**

Christopher Palmer

1. Empirical hazard models
2. Empirical models of prepayment behavior
3. Competing risk models
4. Alternative covariate models

**Project Proposal Assignments handed out – Proposals due September 12.**

### Lecture 4: Multi-factor Valuation Models

**August 24 (Wednesday)**

Christopher Palmer

1. Valuation with prepayment and default
2. Structural models of prepayment and default behavior

**Homework Set 2 handed out: Due September 7:** Empirical Hazard Modeling

**Discussion Session 2 (Thursday August 25): Modeling MBS Cash Flows (F320, 10:00 – 12:00)**

### Lecture 5: The Economics of Securitization

**August 29 (Monday)**

Christopher Palmer

1. Limitations of alternative instruments (such as debt and equity)
2. The theoretical foundations of securitization
3. Asymmetric information in the ABS markets
4. Pooling, tranching, and enhancements.

### Lecture 6: CMBS and Indexed derivative products

**August 31 (Wednesday)**

Nancy Wallace

1. CMBS structures and valuation.
2. Mechanics of the Indexed Derivatives Markets.
3. ABX/CMBX and other indexed products

**Discussion Session 3 (Thursday September 1): Hazard Rate Modeling and Tranching (F320, 10:00 – 12:00)**

**Monday September 5 is Labor Day: No Class**

**Lecture 7: Short-term Funding Vulnerabilities**

**September 7 (Wednesday)**

Nancy Wallace

1. Funding the origination pipeline – Master Repurchase Agreements
2. When repo goes wrong
3. FinTech Case Study
4. REMINDER: Project proposals are due

**Homework Set 3 handed out: Due September 19: Indexed CDS valuation**

**Discussion Session 4 (Thursday September 8): Indexed CDS Valuation Modeling (S300T, 10:00 – 12:00)**

**Lecture 8: Market Microstructure, Stress Testing and Asset Backed Market Reforms**

**September 12 (Monday):**

Christopher Palmer

1. The TBA, repo and forward commitment markets.
2. Stress-test methods of risk analysis.
3. Asset backed security market reforms.

**Lecture 9: High-Risk Securitization: Energy and weather derivative products**

**September 14 (Wednesday)**

Nancy Wallace

1. Modeling energy derivatives.
2. Modeling weather derivatives
3. Modeling energy-related structured products: Commercial Mortgages.

**Lecture 10: Machine Learning and Big Data Credit Risk Analytics**

**September 19 (Monday)**

Nancy Wallace

1. Overview of big data structures and database management
2. Machine learning technology and credit risk evaluation
3. Applications: MBS, credit cards, and fintech.

**Lecture 11: Rating Agencies**

**September 21 (Wednesday)**

Nancy Wallace

1. Intro to Rating Agencies
2. Reduced-form credit risk modeling.

**Lecture 12: Insurance-Linked Securities**

**September 26 (Monday)**

Nancy Wallace

1. Review of traditional methods for risk transfer in financial markets
2. Economic benefits of securitization for non-standard (exotic) risk classes
3. Case study: catastrophe insurance

**Lecture 13: Other Products**

**September 28 (Wednesday)**

Christopher Palmer

1. Auto loan securitization structures
2. Chrysler PAT auto loan example
3. Credit card securitization structures
4. Proposal to Securitize Cancer Research R&D

**Lectures 14 and 15: Student Project Presentations**

**No class on October 3 and 5** (finalize student projects)

**October 7 (Friday)**

**October 10 (Monday)**

**Final Exam In Class**

**October 12 (Wednesday), 9:30 a.m. – 12:30 p.m.**