



Business 33453 – Housing and the Economy

Spring Quarter 2013 – Syllabus

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Summary of Topics Covered

Housing contributes over 16% to U.S. GDP and is the largest asset on the household sector's balance sheet, while the mortgage market constitutes the second largest U.S. credit market, just behind Treasuries and well ahead of corporate debt. In this course we study the economic forces driving housing and mortgage markets, and their interactions with the wider macro economy. We begin by developing an equilibrium model of the housing, rental and construction sector. In the process we discuss the drivers of demand for housing services such as economic conditions and demographics, as well as the forces determining the valuation of housing assets, such as the tax treatment of mortgage interest. We use this model to analyze a number of theories of the recent boom-bust episode, perform valuation analysis on regional housing markets and discuss the short-run and long-run effects of possible changes to government policy. We then discuss the drivers of house prices at a more local level, analyzing the role of location, house characteristics and local amenities, as well as considering the role of information frictions in real estate markets. In the process, students will get an opportunity to perform a number of empirical valuation analyses using real-world data. We then move onto understanding the economics of mortgage markets. We begin by considering the risks inherent in mortgage lending, focusing on default and prepayment risk. We discuss the theory and evidence behind different explanations for mortgage default (strategic default versus liquidity defaults), and analyze recent policy proposals to reduce foreclosures. We also learn about the important differences in the valuation of fixed-rate and adjustable-rate mortgages. We next introduce secondary mortgage market, and learn about the structure of mortgage-backed securities and the role of the government through Fannie Mae, Freddie Mac and Ginnie Mae. In the process, we discuss the advantages and disadvantages of securitization. Finally we will consider the channels of feedback from the housing markets to the rest of the economy, focusing on household and bank balance sheets, and discuss recent

government interventions to deal with the housing crisis, as well as the Federal Reserve's quantitative easing policy. The course involves a group project that encourages students to use the newly-acquired tools to identify real estate related investment opportunities. Throughout the course, wherever relevant, I will tell students about my own research as well as current relevant research of other academics from Booth and the wider profession. This course should be interesting to anybody thinking about buying a house, investing in real estate or working in finance more generally (e.g. global macro hedge funds).

Course Time and Location

The University has assigned the following times for the two sections:

33453-01	Tuesday/Thursday	10:10AM-11:30AM	Harper Center, C02
33453-81	Thursday	6:00PM-9:00PM	Gleacher Center, 303

Classes begin in the week starting Monday, April 1, 2013, and will go on for 10 weeks.

Additional (optional) Classes

There will be two additional (and optional) classes in addition to those scheduled through the university. First, Yunzhi Hu will offer a class on an introduction to doing house price evaluation using Stata during the week of the empirical project (see below). The class is on Saturday, April 27 at 10am -12am in Gleacher Room 300. In the second half of the class he will be at the Gleacher computer lab to help you with practical questions. Secondly, there will be a review session on Saturday, June 8 (Week 10, the weekend before your final exam) at 1.30pm – 3pm at Gleacher 400, where you can ask questions about the course.

Prerequisites

Given the relevance of the topic discussed in this course to a broad audience of students I do not want to impose any strict prerequisites. However, basic concepts of microeconomics, macroeconomics and statistics will repeatedly show up, and I expect students to be willing to acquire an understanding of these concepts. Suggested courses are Microeconomics (33001) and one of Business Statistics (41000) or Applied Regression Analysis (41100).

Course Website

We will be using Chalk (<http://chalk.uchicago.edu>) to post most of the material for this class. You will need your CNET ID and password to log in.

Course Components and Grades

The final grade will be comprised of four components as described below. As you know there is a class mean upper bound GPA of 3.33 imposed by the school.

<u>Component</u>	<u>Percentage of Total Grade</u>
Final Exam	40%
Midterm Exam	20%
Quizzes	20%
Group Investment Project	20%

Midterm and Final Exam

There will be an in-class 1 hour 20 minute optional mid-term exam in the second half of Week 5, and a final exam during exam week. Both exams will be closed-book. You are allowed to bring a calculator (though no smartphones). The midterm exam will cover all materials discussed up to the end of Week 4; the final exam will be cumulative and cover all material.

The dates for the final exam are set by Chicago Booth to be:

Full Time Program (33453-01): Tuesday, June 11: 11.30am – 2.30 pm

Evening Program (33453-81): Thursday, June 13: 6.30pm – 9.30pm

If you choose not to take the midterm exam, your final exam will be weighted 60%. If you perform better on the final than the midterm, your final exam will be weighted 60%. Hence, taking the mid-term exam is like a free option for you. Also, if you want to receive a provisional grade, you have to take the midterm exam.

The honor code will be enforced during all exams. There will be no make-up exams. If you start an internship prior to the final exam, you will have to ask your manager to email me by the end of week 3 stating that they are unwilling to move the start date of your internship. You also have to inform Christine Gramhofer (Christine.Gramhofer@chicagobooth.edu), who will be managing the logistics of the off-site exam (I believe you received an email about the procedures on this already).

If you want to switch from your section to the other in the final exam, you must inform me that you wish to do so by May 25 so that a sufficiently large examination room can be booked. If you are unable to take any of the final exam for any medical/family emergency, your course grade will be recorded as Incomplete and you will be permitted to write the exam the next time I teach the course. Of course, you will be required to produce documentation to substantiate your emergency.

Quizzes

There will be two 20-minute quizzes, at the beginning of Week 3 and Week 9. These quizzes will be graded and equally weighted in determining the final grade. Those students that pass the empirical project will have their lowest quiz-score replaced by a full score.

Empirical Project

As part of Topic 2 (House Prices – The Micro Dimension) you will learn about methods to determine how much you should pay for a particular house. To give you an opportunity to apply these skills in practice, I have developed an empirical exercise that will take you through the valuation process for a number of properties, similar to the process that any real estate investor would have to go through. While this project can be time-consuming to do well, I think the returns to those of you interested in the more quantitative side of real estate are enormous.

I will provide you with a training dataset on housing transaction prices and the characteristics of the associated houses for a sample of homes in Douglas County, CO. You can use that dataset to analyze the determinants of prices in that particular market, using the ideas discussed in class. You will then use your insights to determine prices you would be willing to pay for a set of homes for which you know the characteristics, but not the transaction prices. As the “deliverable” for this project you submit a 2-3 page report on what you have learned about the determinants of prices in this market (for example, by showing regression tables and discussing the coefficients) and your price predictions for each home in the test sample.

Since this project will be most easily done if you use some statistical analysis package such as Stata, R, EViews or Matlab, and not everybody will be familiar with these packages, I will allow submissions of up to 6 people. The honor code will require that each member of the group contributes substantially to the project, and can explain the group’s submission. To help you with the project, Yunzhi will do an introductory class on these programs and how to do some of the coding in Stata, which is available to all of you in the Harper or Gleacher computer labs. This project will be evaluated on a pass/fail basis with those students passing the empirical project being able to replace their worst quiz grade with a full score (see above).

Group Investment Project

Throughout the course I want to encourage you to think about how to use the tools learned and the information acquired to identify promising investment opportunities in real estate broadly defined. You should form groups of 5-6 students to discuss and develop your ideas. Please email Yunzhi and me your groups by the end of week 3. We will allocate those students not part of a group by then to existing groups, or form a new group.

As part of the evaluation of this course, each group should pick its most promising idea and outline it to the rest of the class in a 10-15 minute presentation followed by a 5-10 minute Q&A

in Week 10. In addition to the presentation, each group should submit a 4-5 page discussion of their idea by midnight on Sunday of Week 9 (June 2nd). The honor code will require that each member of the group contributes substantially to the project, and can explain the group's submission.

In the discussion and the presentation, I want you to focus on a few key points:

- What is the investment opportunity?
- What are the important assumptions that make this a profitable opportunity?
- Why do you think these assumptions are justified?
- What are the risks involved in your project?

There are many possible directions this could go. You could think about opportunities generated by possible changes in government policy (e.g. should mortgage interest deductibility get removed), infrastructure projects (which parts of town would benefit the most?), firm location decisions (what happens when a large employer comes to town?) or demographic changes and gentrification. Maybe the empirical project allows you to identify a source of mispricing that you think you can exploit. Maybe you can think of opportunities in the secondary mortgage market (e.g. you think that prepayment characteristics or default correlations will change in the future), or maybe you want to think through the effects of changes to the quantitative easing policy that you think are likely. Anything that is related to material covered in the course is admissible.

Case Study

As preparation for Week 8 students will cover the “Rosetree Mortgage Opportunity Fund” case study, which will be discussed in Week 8. There will be no formal evaluation of students' performance here (I don't like grading class participation, since it makes it more “forced” in my view). However, many of the concepts and valuation exercises covered in the case study will be tested in the final exam, so I strongly encourage all of you to take the case preparation and resulting class discussion very serious.

Course Policies

Office hours: By email appointment.

Email Communications: I will allocate Monday and Thursday afternoons for responding to email questions. If your question is urgent, please indicate this in the subject line and I will try to respond within 24 hours. On occasion, I might post some of student questions and my answers to them on Chalk. Of course, all student identifiers will be removed and I will only post your question if you do not request otherwise (i.e., if you do not want your question posted, it is perfectly acceptable to state this in your email).

Regrade Policy: Any regrade request for a quiz/exam must be submitted within 3 days in writing after I return the exam to you. Regrade requests must give substantive reasons why

specific questions were graded improperly. I will regrade the entire exam and provide a response within one week. The exam score and course grade may go up or down or remain unchanged as a result of the regrade. The regrade outcome is final.

Provisional Grades: For those graduating, I will give a provisional grade if you have taken the midterm and performed at a level of at least C. Requests should be submitted before the midterm.

Honor Code: Students must adhere to the standards of conduct outlined in the Chicago Booth Honor Code and Standards of Scholarship. The Honor Code is always in effect. Any violations will be reported to the Dean's Office and punished to the greatest extent possible without exception.

My mid-term review: At the end of week 4 I will provide you with an opportunity to anonymously provide me with feedback about how to improve the course in terms of the speed with which we cover material etc. Obviously, please feel free to send me any feedback or make recommendations throughout the quarter.

Reading List

The Syllabus below gives more of an overview of the topics covered and includes literature on each topic. Overall the course will broadly cover four topics, which will span more than one week. A rough timeline on when we will cover which topics is below.

	Material Covered
Week 1	Why study real estate? Course structure! House Prices - The Macro Dimension (1)
Week 2	House Prices - The Macro Dimension (2)
Week 3	Quiz on first two weeks House Prices - The Micro Dimension (Cities)
Week 4	House Prices - The Micro Dimension (Housing Attributes)
Week 5	Discussion of Empirical Exercise House Prices - The Micro Dimension (Information Issues) Midterm Exam (1 hour, 20 minutes)
Week 6	Mortgages - Primary Mortgage Market
Week 7	Mortgages - Primary Mortgage Market / Secondary Mortgage Market
Week 8	Rosetree Mortgage Case Mortgage - Secondary Mortgage Markets
Week 9	Quiz on Weeks 6 - 8 (Mortgage Markets) Housing and the Real Economy
Week 10	Review Session - Tying it all together Presentation of Class Project Results

Every topic has a number of readings to guide your own study of the material. There is no one required textbook for the course, but you will see below that I have assigned individual chapters from different textbooks for different parts of the course. The two textbooks we will be using chapters from are:

“Urban Economics and Real Estate Markets,” Denise DiPasquale and William Wheaton

“Real Estate Finance and Investments,” William Brueggeman and Jeffrey Fisher

The mandatory reading is indicated by (*), and could constitute part of the mid-term or final exam. I expect you to read the mandatory material in advance of class. This will help you understand the lectures better, and will allow you to participate in the in-class discussions. The other readings are also interesting and will complement the lecture slides. These readings are broad, and you can select those that cover the topics you personally find most interesting. Some of the optional readings will be academic papers that consider the topics we cover in class, but might be harder for some of you to read, due to heavy use of statistics. For others, though, these papers will expand your understanding of the material significantly, and give you a sense of the breadth of tools available to real estate analyst and investors.

I will post the lecture slides in advance of the lectures. I reserve the right to make last minute changes to the slides, so there is no guarantee that the set of slides that is posted will be the most up-to-date. I will make sure that I post the up-to-date version after the class.

Topic 1 – House Prices Part I – The Macro-Dimension

How to measure house prices, and some facts (Week 1)

(*) “House Price Moments in Boom-Bust Cycles” Todd Sinai, Working Paper, The Wharton School, University of Pennsylvania and NBER, April 2012.

(*) “A Guide to Aggregate House Price Measures”, Jordan Rappaport, Federal Reserve Bank of Kansas City, Economic Review, 2007

“How Housing Busts End: Home Prices, User Cost, and Rigidities During Down Cycles,” Karl E. Case and John M. Quigley, Working Paper No. W08-008, Program on Housing and Urban Policy, Institute of Business and Economic Research, Fisher Center for Real Estate and Urban Economics, September 2009

“House Price Index Methodologies,” N. Edward Coulson, Department of Economics, Penn State University

“Superstar Cities,” Chris Mayer, Todd Sinai, Joseph Gyourko, Columbia Ideas at Work, May 2007

“Anatomy of the Beginning of the Housing Boom: U.S. Neighborhoods and Metropolitan Areas, 1993-2009” Fernando Ferreira and Joseph Gyourko, Working Paper, The Wharton School, University of Pennsylvania, August 18, 2011

Long-Run Equilibrium Model – Drivers of home prices (Week 1)

(*) Wheaton and Di Pasquale, Chapter 1

(*) “Understanding House-Price Dynamics,” Makoto Nakajima, Business Review, 2011

(*) “New San Francisco Tech Boom Brings Jobs but Also Worries,” Norimitsu Onishi, June 4, 2012. New York Times.

(*) “Eating Towns, Drinking Towns”, Trulia, 2012

“San Francisco Rents the Highest of Any City In Country,” Aaron Sankin, Huffington Post, March 2012

“How the Rich Get Richer, Rental Edition,” Scott James, February 17, 2012. New York Times

“National Homeownership Strategy: Partners in the American Dream,” Message from the President, U.S. Department of Housing and Urban Development, May 1995

“Why Do Households Without Children Support Local Public Schools?” Hilber, Mayer, Sept. 2004

Long-Run Equilibrium Model – Drivers of home prices – Office Space Example (Week 2)

“Estimating Office Space per Worker,” Norm Miller, May 2012

“U.S. Office Trends Report,” Cassidy Turley, 3rd Quarter 2012

Long-Run Equilibrium Model – Drivers of home prices – Monetary Policy (Week 2)

(*) The Economist (Oct 18th 2007) - Fast and loose How the Fed made the subprime bust worse

“Housing and Monetary Policy,” John B. Taylor, Stanford University, September 2007

Long-Run Equilibrium Model – Drivers of home prices – Housing Supply Elasticity (Week 2)

(*) “The Geographic Determinants of Housing Supply,” Albert Saiz, The Quarterly Journal of Economics, 2010

“A New Measure of the Local Regulatory Environment for Housing Markets: The Wharton Residential Land Use Regulatory Index,” Joseph Gyourko, Albert Saiz and Anito Summers, The Wharton School, March 2007

Long-Run Equilibrium Model – Drivers of home prices – The Role of Expectations (Week 2)

(*) “To Buy or Not to Buy? The Changing Relationship between Manhattan Rents and Home Prices,” Bram, Current Issues in Economics and Finance, Volume 18, No.9, 2012

“Housing Bubbles: A Survey,” Christopher Mayer, Annual Rev. Econ. 2011

Long-Run Equilibrium Model - Government Interventions – Mortgage Interest Deductibility (Week 2)

“Government Intervention in the Housing Market: Who Wins, Who Loses?” Johannes Stroebel and Max Floetotto, Stanford University

“Reforming the Mortgage Interest Deduction” Eric Toder, Margery Austin Turner, Katherine Lim, Liza Getsinger, April 2010.

Topic 2 – House Prices Part II – The Micro Dimension

City Models (Week 3)

(*) Wheaton and Di Pasquale, Chapters 3 and 4

“The Economics Approach to Cities,” Edward Glaeser, NBER Working Paper Series, December 2007

“Urban World: Mapping the Economic Power of Cities,” Dobbs, Richard; Smit, Sven; Remes, Jaana; Manyika, James; Roxburgh, Charles; Resrepo, Alejandra; McKinsey Global Institute

“Reshaping Economic Geography” World Development Report; The World Bank. 2009.

“The Spatial Distribution of Population in 48 World Cities: Implications for Economies in Transition” Alain Bertaud, Stephen Malpezzi, December 17, 2003

City Change (Week 3)

(*) “Changes in the Nature of Urban Spatial Structure in the United States, 1890-2000” Sukkoo Kim, *Journal of Regional Science*, Vol. 47, No. 2, 2007

“Which Chicago Neighborhoods Have Been Most Changed By Gentrification?” Samantha Abernethy, 2012

“Gentrification before Gentrification? The Plight of Pilsen in Chicago,” John Betancur, Urban Planning and Policy Program, University of Illinois at Chicago, A Nathalie P. Voorhees Center for Neighborhood and Community Improvement White Paper, Summer 2005

“Reaction of House Prices to a New Rapid Transit Line: Chicago’s Midway Line 1983-1999” Daniel P. McMillien and John McDonald. *Real Estate Economic*, 2004 V 32, pp. 463-486.

“Historical Perspectives on U.S. Economic Geography,” Sukkoo Kim, Rober A. Margo, NBER Working Paper Series, March 2003

“World Development Report: Part Two, Shaping Economic Geography,” The World Bank

“Urban World: Mapping the Economic Power of Cities,” McKinsey Global Institute, March 2011

Tax Increment Financing (Week 3)

(*) “Urban Revitalization and Tax Increment Financing in Chicago,” Lori Healey and John F. McCormick, Government Finance Review, December 1999

“Stimulus, Chicago-Style” Ben Joravsky, Chicago Reader, March 26, 2009.

“LaSalle Central Redevelopment Project Area: Tax Increment Finance District Eligibility Study, Redevelopment Plan and Project.” Richard Daley, November 6, 2006.

“Tax Increment Financing and Chicago Public Schools Construction Projects,” Chicagoland Researchers and Advocates for Transformative Education, Research Brief #3, 2012

“Tax Increment Finance District Eligibility Study, Redevelopment Plan and Project,” Richard M. Daley, Mayor, LaSalle Central Redevelopment Project Area, S.B. Friedman & Company, 2006

Hedonic Regression Models (Week 4)

(*) “Hedonic Pricing Models: A Selective and Applied Review,” Stephen Malpezzi, 2002

“Statistical Machine Learning: Overfitting and Model Selection,” Justin Domke and Linwei Wang.

“Hedonic Methods and Housing Markets,” N. Edward Coulson, Department of Economics, Penn State University

Information Asymmetries in Housing Markets (Week 5)

“The Impact of Asymmetric Information about Collateral Values in Mortgage Lending,” Johannes Stroebel, University of Chicago

Interesting Online Data Sources, Visualizations and other resources

Income distribution by Census Tract: <http://www.richblockspoorblocks.com/>

Trulia Crime Maps: <http://www.trulia.com/crime/>

Trulia Price Reduction Map: <http://explore.trulia.com/datavis/pricereduct/Q1-2011/>

TED Talk by Eduardo Paes, Mayor of Rio de Janeiro on the “The Future of cities”
<http://www.youtube.com/watch?v=B8Z2G7d2kzs>

Topic 3 – Mortgage Financing

Mortgage Types (Week 6)

- (*) Brueggemann, Fisher, Chapters 3, 4, 5
- (*) Fixed-Rate Mortgage Analysis Spreadsheet on Chalk

Drivers of Mortgage Default (Week 6/7)

- (*) “What Have We Learned About Mortgage Default?” Ronel Elul, Business Review, 2010
- “Mortgage Market and the Financial Crisis: What ‘Triggers’ Mortgage Default?” Ronel Elul, Nicholas S. Souleles, Souphala Chomsisengphet, Dennis Glennon, Robert Hunt, American Economic Review: Papers and Proceedings 100, May 2010
- “Get Sick, Get Out: The Medical Causes of Home Mortgage Foreclosures,” Christopher Tarver Robertson, Richard Egelhof and Michael Hoke, 2006
- “Foreclosure and Bankruptcy-Policy Conclusions from the Current Crisis,” Theresa Kuchler and Johannes Stroebe, Stanford Institute for Economic Policy Research, April 2009
- “Moral and Social Constraints to Strategic Default on Mortgages,” Luigi Guiso, Paula Sapienza, Luigi Zingales, NBER Working Paper Series, July 2009

Securitization – Market Structure, MBS Pricing (Week 7)

- (*) Brueggemann and Fisher, Chapter 19, Chapter 20
- (*) “The Role of Securitization in Mortgage Lending,” Richard Rosen, Chicago Fed Letter, The Federal Reserve Bank of Chicago, November 2007
- (*) “Questions and Answers about the Financial Crisis: Prepared for the U.S. Financial Crisis Inquiry Commission,” Gary Gorton, NBER, February 2010
- “Report on Special Purpose Entities,” Basel Committee on Banking Supervision, September 2008.
- “Securitization,” Gary Gorton and Andrew Metrick, NBER Working Paper 18611, December 2012.
- “The Rise and Fall of the U.S. Mortgage and Credit Markets: A Comprehensive Analysis of the Meltdown,” James Barth, Tong Li, Wenling Lu, Triphon Phumiwasana and Glenn Yoga. Milken Institute, 2009
- “The Economics of Structured Finance,” Joshua Coval, Jakub Jurek and Erik Stafford, Harvard Business School Working Paper 09-060. 2008
- “Special Purpose Vehicles and Securitization” Gary Gorton and Nicholas Souleles, Working Paper, The Wharton School, University of Pennsylvania. September 2005.

“Analysis of Mortgage-Back Securities: Before and After the Credit Crisis” Harvey Stein, Alexander Belikoff, Kirill Levin, Zusheng Tian, 2011

“Asset-Backed Securities: Cost and Benefits of ‘Bankruptcy Remoteness’,” Kenneth M. Ayotte, Stav Gaon, Columbia Business School

“The Rise and Fall of the U.S. Mortgage and Credit Markets: A Comprehensive Analysis of the Meltdown,” James R. Barth, Jong Li, Wenling Lu, Triphon Phumiwasana and Glenn Yago, The Milken Institute, 2009

“The Joint Forum: Report on Special Purpose Entities,” Basel Committee on Banking Supervision, September 2009

“Can Metropolitan Housing Risk be diversified? A Cautionary Tale from the Recent Boom and Bust” John Cotter, Stuart Gabriel, Richard Roll, July 11, 2012

“The Economics of Structured Finance,” Joshua D. Coval, Jakub Jurek and Erik Stafford, Working Paper, Harvard Business School, 2008

“Special Purpose Vehicles and Securitization,” Gary Gorton and Nicholas Souleles, NBER, September 2005

Fannie Mae, Freddie Mac and Ginnie Mae (Week 8)

(*) Guaranteed to Fail, Chapter 1, Chapter 8

(*) “Fannie and Freddie: The Saga in Charts,” Matt Philips, The Wall Street Journal, Feb 11, 2011

“Credit Ratings and the Evolution of the Mortgage-Backed Securities Market” Jie He, Jun Qian and Philip Strahan, American Economics Review: Papers and Proceedings, 2011

“Guaranteed Mortgage Pass-Through Certificates (Single-Family Residential Mortgage Loans)” Fannie Mae, February 1, 2012

“Fannie Mae and Freddie Mac: Analysis of Options for Revising the Housing Enterprises’ Long-Term Structures,” United States Government Accountability Office, Report to Congressional Committees, September 2009

TBA Market (Week 8)

“Written Statement On Behalf of The Securities Industry and Financial Markets Association: Examining the Housing Finance System: The To-Be-Announced Market,” Thomas Hamilton, August 3, 2011

“TBA Trading and Liquidity in the Agency MBS Market,” James Vickery and Joshua Wright, Federal Reserve Bank of New York Staff Reports, Staff Report No. 468, August 2010

Information Issues in Securitization (Week 8)

“Did Securitization Lead to Lax Screening? Evidence from Subprime Loans” Benjamin Keys, Tanmoy Mukherjee, Amit Seru, Vikrant Vig, *The Quarterly Journal of Economics*, February 2010

“Securitization and Mortgage Default,” Ronel Elul, Working Paper Federal Reserve Bank of Philadelphia. May 12, 2011.

Topic 4 – Housing and the Real Economy (The Great Recession)

Household Balance Sheet Channel (Week 9)

(*) “Household Balance Sheets, Consumption and the Economic Slump.” Atif Mian, Kamallesh Rao and Amir Sufi, Working Paper, The University of Chicago, June 2012

“What Explains High Unemployment? The Aggregate Demand Channel.” Atif Mian and Amir Sufi, Working Paper, The University of Chicago, July 2012

“Is Housing Wealth an “ATM”? The Relationship Between Household Wealth, Home Equity Withdrawal, and Saving Rates,” Vladimir Klyuev and Paul Mills, *IMF Staff Papers*, Vol, 54, No.3, 2007

“Sources and Uses of Equity Extracted from Homes,” Alan Greenspan and James Kennedy, *Oxford Review of Economic Policy*, Vol 24, No. 1, 2008

“From Power Tools to Carpets, Housing Recovery Signs Mount,” Kate Linebaugh and James Hagerly, *The Wall Street Journal*, January 27, 2013

Bank Balance Sheet Channel (Week 9)

(*) “The Employment Effects of Credit Market Disruptions: - Firm-level Evidence from the 2008-09 Financial Crisis.” Gabriel Chodorow-Reich, Working Paper, UC Berkeley, 2013

“The Effects of Bank Capital on Lending: What Do We Know, and What Does it Mean?” Jose M. Berrospide and Rochelle M. Edge, Finance and Economics Discussion Series Divisions of Research & Statistics and Monetary Affairs Federal Reserve Board, Washington, D.C., 2010

“The Real Effects of Financial Constraints: Evidence from a Financial Crisis,” Murillo Campello, John R. Graham, Campbell R. Harvey, National Bureau of Economic Research, 2009

“Did TARP Increase Lending?” Casey Mulligan, *The New York Times*, October 7, 2009

“The Balance Sheet Recession in the U.S.” Martin Wolf, *Financial Times*, July 19, 2012

Quantitative Easing (Week 9)

(*) “Quantitative Easing Explained,” Economic Information Newsletter, April 2011

(*) “Four Stories of Quantitative Easing,” Brett W. Fawley and Christopher J. Neely, Federal Reserve Bank of St. Louis Review, January/February 2013, 95 (1), pp. 51-88

“Estimated Impact of Federal Reserve’s Mortgage-Backed Securities Purchase Program” Johannes Stroebel, John B. Taylor, *International Journal of Central Banking*, June 2012

“Questions about Recent Monetary Policy,” John B. Taylor, Presented at the Centennial Celebration of Milton Friedman and the Power of Ideas, University of Chicago, November 2012

The Financial Market Effects of the Federal Reserve’s Large-Scale Asset Purchases,” Joseph Gagnon, Matthew Raskin, Julie Remache and Brian Sack, *International Journal of Central Banking*, March 2011