THIRD-PARTY REPORTS

Freddie Mac engaged industry experts to assist in valuing our Multifamily business and assessing the potential market impact of operating the business without a government guarantee. Their findings are reflected in Freddie Mac's "Report to the Federal Housing Finance Agency: Housing Finance Reform in the Multifamily Mortgage Market." In the spirit of transparency, we are including the third parties' full reports here.

Business valuations and financial forecasts:

- **Barclays Capital**
- **Morgan Stanley**   REDACTED *

Multifamily market impact analyses:

- **CBRE Global Research and Consulting**
- **Moody's Analytics**

* In lieu of redacted Morgan Stanley report, an Executive Summary of their report is included herein.

Barclays' full report on the potential financial performance and valuation of Freddie Mac Multifamily operating absent a government guarantee follows.

Freddie Mac Multifamily

November 2012

CONFIDENTIAL

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Freddie Mac

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Executive Summary

Executive Summary

Overview of Advisory Assignment

Barclays has been engaged by Freddie Mac to provide analysis, commentary and advice associated with the viability of Freddie Mac's multifamily business operating as a standalone entity ("MFI"). We have been specifically asked to address the viability of MFI under various forms of government guarantee, with the range of our work product to include valuation analysis, business segment analysis, recommendations regarding an appropriate and actionable capital structure as well as market analysis, where applicable.

Please note that we have neither been requested to opine as to, and our analysis herein does not in any manner address, Freddie Mac's underlying business decision to proceed with or effect any potential transaction nor the merits of any potential transaction contemplated herein in comparison to other strategies or transactions that might be available to Freddie Mac.

Summary of Analysis

We have focused our analysis on two primary scenarios: one under which no government guarantee is available to any MFI-sponsored securities ("No Guarantee" or "No G" scenario) and another under which a government guarantee is available on all MFI-sponsored securities ("Guarantee" scenario). In framing our analysis, we have viewed the No Guarantee and Guarantee scenarios as bookends on the spectrum of structural scenarios under which MFI could potentially operate. Please note that the majority of our analytical work has been focused on analyzing the two primary scenarios. In addition, we have examined three scenarios which we believe fall within the bookends: a scenario where a government guarantee is only available on MFI-sponsored securities backed by collateral that is deemed to be affordable housing ("G on Affordable"), a scenario under which the government guarantee, as currently existing on Freddie Mac multifamily securities, is phased out over a 10-year time horizon ("G Phase Out"), and finally, where a government guarantee is available to MFI-sponsored securities as well as to other qualified multifamily mortgage underwriters who meet a set of government-prescribed eligibility criteria ("G Available to Qualified Players").

Our analysis under all scenarios is subject to a series of overarching assumptions. For the purpose of our analysis, we have assumed that the Freddie Mac multifamily business will not be at a competitive disadvantage to the Fannie Mae multifamily business, including with respect to government support. For the purpose of our overall analysis, we have also assumed that the Freddie Mac multifamily business is operating under a "normal" operating environment. There may be varying levels of potential downside risk to the valuation in an adverse operating environment. However, we do analyze the impact of a discreet set of stress assumptions on the No G scenario business model on pages 20 - 21. Further, our analysis also does not consider any potential impact of increases in the Guarantee fee on asset yields and market volumes.

Executive Summary (cont.)

The following presentation is composed of the Executive Summary, which seeks to present the key components of Barclays' work, and the various Appendices, which provide additional details such as full financial statements and various supporting analyses.

The Executive Summary addresses the following:

- Key assumptions driving the projections model

- Impact of the guarantee fee on segment returns

- Segmented business line returns and overall business line composition

- Historical conduit origination volumes to be considered in the No G scenario

- Analysis of viability of funding the HFI portfolio through a REIT structure

- Summary model outputs for Guarantee and No Guarantee scenarios

- Valuation approach and summaries for each scenario

<u>Valuation</u>

We have performed a valuation analysis of MFI based on a series of assumptions and scenarios as discussed. Please note that the required capitalization of MFI, as funded by Freddie Mac initially, varies depending on the particular scenario. Therefore, while we present a gross value for the entity under each scenario, the presented net value to Freddie Mac after considering the initial required capitalization represents the ultimate value of MFI to Freddie Mac under our analysis.

We have calculated the value of MFI under the No Guarantee scenario to be within $350 million to $500 million of value to Freddie Mac, net of an initial equity contribution of $500 million, and representing a gross valuation multiple of 1.7x to 2.0x of Freddie Mac's initial invested capital. As discussed in further detail in the following pages, we view this business model as most closely resembling a conduit lender, where valuation is largely based on a multiple of price to book value. We have calculated the value of MFI under a Guarantee Scenario to be between $1.7 billion and $3.2 billion of net value to Freddie Mac. This valuation range is net of an initial equity contribution of $2.8 billion in our model, and is based on a sum of the parts approach given the diversity of the separate business lines within MFI under this scenario. The gross value of MFI under the Guarantee scenario yields a multiple range of 1.6x to 2.1x Freddie Mac's initial invested capital. Valuations for MFI under the intermediate scenarios fall within the range of the bookend scenario values, and are also discussed in the following pages and appendices to this presentation.

Note: Any estimates and projections have been prepared by or in consultation with Freddie Mac management, were obtained from publicly available sources, or are based upon such estimates and projections.

Executive Summary (cont.)

Findings and Considerations

In valuing the business under each scenario, Barclays analyzed the return profile of each component business line. In addition, beyond the immediate impact on profitability as a distinct business line, we view the presence of a government-sponsored guarantee to have significant, broader implications upon the MFI franchise. From a liquidity perspective, in a No Guarantee scenario, MFI's ability to fund itself will be subject to market conditions, which could severely impair the business in times of market stress. As a result, Barclays analyzed both historical conduit origination volumes (i.e., originators operating without the benefit of a guarantee) as well as the high level impact on MFI of certain downside cases under the No G scenario.

MFI is capitalized based on market and regulatory requirements and MFI generally engages in business whereby investors receive a required market rate of return. For the Guarantee scenario, Freddie Mac parent, and any entities providing support to MFI, would be reinsuring a super senior position credit enhanced to AAA. We expect the required capital necessary for reinsurance with this level of credit enhancement to be minimal, and we expect that the majority of guarantee fee payments received by Freddie Mac would primarily flow to net income, offering an attractive return to Freddie Mac parent et al.

As previously mentioned, the viability of MFI is less certain under a No Guarantee scenario, and MFI would exist in a more sustainable, competitive state with some form of a guarantee in place. Additionally, beyond valuation and viability considerations, broader implications should also be considered in evaluating the appropriate structure for Freddie Mac and MFI going forward. These external considerations include the following:

- Reduced access to capital caused by dislocation in the multifamily financing markets associated with the removal of the guarantee
  - Impact on overall real estate values, which could potentially cause credit impairments on bank and insurance company balance sheets
  - Impact of multifamily market dislocation on the construction loan market and by extension, the associated impact on the construction labor market

- Potential reduction in availability and capacity of mortgage credit for affordable multifamily housing, and its attenuated social and political implications

In summary, while the following pages lay out comparative analytics for MFI under several structural scenarios, we recommend our findings be utilized in context along with a broader analysis of the impact of any such decisions regarding the future of Freddie Mac's multifamily business.

Potential Guarantee Fee Analysis

Barclays has modeled the guarantee business based on a 25 bps guarantee fee, which would improve returns with assumed minimal impact to origination volumes provided

Commentary

- Under the guarantee structure, MFI assumes the risk of massive losses in a catastrophe scenario
    - MFI capital sits in front of Freddie Mac in absorbing losses
    - Absent ring-fenced capital, in an environment where losses cross the AAA attachment point, MFI equity would likely be wiped out
- Regulators will require MFI to hold capital against its guarantee portfolio under Basel III
    - 20% risk weighting on all K-Series, CE Bonds and TEBS
    - 10% capital requirement against risk weighted assets
- Initial model assumptions were based on guarantee fees of 16 bps and cost paid to Freddie Mac of 10 bps
- Given these assumptions, we have assessed that the standalone guarantee business yields low single digit return on equity
    - Guarantee business does not meet its required returns (cost of equity) on a standalone basis
    - Under this construct, other MFI operations (NIM, GoS, portfolio management) are effectively subsidizing the guarantee business
- In order to achieve a market return, the guarantee would need to increase

Sensitizing Guarantee Fees

- Barclays has sensitized ROEs of the guarantee business under different fees to help inform the appropriate pricing for MFI to meet its required rates of return

ROE											
G-Fee (bps)	12/31/13	12/31/14	12/31/15	12/31/16	12/31/17	12/31/18	12/31/19	12/31/20	12/31/21	12/31/22	12/31/23
16.0 bps	3.1%	2.8%	2.6%	2.6%	2.5%	2.6%	2.5%	2.6%	2.6%	2.5%	2.5%
25.0 bps	3.6%	3.8%	4.0%	4.3%	4.5%	4.7%	4.9%	5.1%	5.2%	5.2%	5.2%
35.0 bps	4.1%	5.0%	5.6%	6.1%	6.6%	7.1%	7.4%	7.9%	8.2%	8.2%	8.3%
45.0 bps	4.5%	6.2%	7.2%	8.0%	8.7%	9.5%	10.0%	10.8%	11.2%	11.3%	11.3%
55.0 bps	5.0%	7.3%	8.8%	9.9%	10.8%	11.9%	12.6%	13.6%	14.2%	14.3%	14.4%

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Business Segment Returns Analysis

The table below shows returns of various business lines assuming a market funding structure and capital requirements

Guarantee Scenario							
($ millions)	12/31/13	12/31/14	12/31/15	12/31/16	12/31/23	Included?	Commentary
HFS (including Trading Securities)							
Net Income	$396	$405	$408	$410	$413	✓	▪ GoS income drives segment returns
Capital Required [1]	1,427	1,310	1,220	1,127	1,120		
Return on Equity	**28%**	**31%**	**33%**	**36%**	**37%**		
Guarantee Portfolio							▪ Requires significant amount of capital against assets
Net Income	$47	$65	$83	$101	$157	✓	▪ Increased guarantee fee to 25 bps
Capital Required [1]	1,329	1,700	2,066	2,373	3,000		▪ HFS returns effectively subsidize this business
Return on Equity	**4%**	**4%**	**4%**	**4%**	**5%**		
HFI							▪ Difficult to finance portfolio; require significant capital against assets
Net Income	$4	$14	$24	$34	$82	✓	▪ Limited amount of affordable HFI necessary in Guarantee scenario
Capital Required [1]	301	607	891	1,134	2,117		
Return on Equity	**1%**	**2%**	**3%**	**3%**	**4%**		
Consolidated Unsub K-Series							▪ Freddie recently issued inaugural unsubordinated notes
Net Income	($1)	($0)	$1	$1	$4	✗	▪ Low volumes to offset fixed costs, minimal net interest margin
Capital Required [1]	49	99	148	190	352		
Return on Equity	**(2%)**	**(0%)**	**0%**	**1%**	**1%**		
Legacy Portfolio Asset Management							▪ Fee-based business on existing platform
Net Income	$3	$6	$4	$7	$10	✓	▪ $25bn "Steady State"; assets under management in line with CW / Walker

Note: Any estimates and projections have been prepared by or in consultation with Freddie Mac management, were obtained from publicly available sources, or are based upon such estimates and projections.
1. _Capital required equals the greater of market and regulatory capital on a segment-by-segment basis._

Business Segment Returns Analysis (cont.)

Absent the guarantee, MFI would likely not meaningfully engage in business lines with below market return / ROE profiles

($ millions)	No G Scenario						
	12/31/13	12/31/14	12/31/15	12/31/16	12/31/23	Included?	Commentary
HFS (including Trading Securities)							
Net Income	$138	$119	$100	$101	$99	✓	▪ Lower balance sheet requirements make returns from GoS business attractive, but subject to market risks
Capital Required [1]	402	358	326	291	283		
Return on Equity	**34%**	**33%**	**31%**	**35%**	**35%**		
Guarantee Portfolio							
Net Income	-	-	-	-	-	✗	▪ No guarantee business under the scenario
Capital Required [1]	-	-	-	-	-		
Return on Equity	**NA**	**NA**	**NA**	**NA**	**NA**		
HFI							
Net Income	$1	$3	$5	$8	$19	✗	▪ Likely would not engage in this business without guarantee
Capital Required [1]	56	134	205	265	494		
Return on Equity	**1%**	**2%**	**3%**	**3%**	**4%**		
Consolidated Unsub K-Series							
Net Income	-	-	-	-	-	✗	▪ No guarantee
Capital Required [1]	-	-	-	-	-		
Return on Equity	**NA**	**NA**	**NA**	**NA**	**NA**		
Legacy Portfolio Asset Management							
Net Income	$4	$5	$3	$6	$9	✓	▪ Fee-based business on existing platform ▪ $25bn "Steady State"; assets under management in line with CW / Walker

Note: Any estimates and projections have been prepared by or in consultation with Freddie Mac management, were obtained from publicly available sources, or are based upon such estimates and projections.
1. *Capital required equals the greater of market and regulatory capital on a segment-by-segment basis.*

No G Origination Volumes Analysis

Achieving MFI volumes that are significantly greater than bank conduit volumes may prove challenging

Representative Non-Bank CMBS Contributors [1]

($ in millions)	2006	2007
Capmark	$2,396	$2,192
CWCapital	1,085	1,332

Post-Crisis Non-Bank Originators

($ in millions)	PF 2012
Walker & Dunlop [3]	$8,800 - 12,400

Walker & Dunlop originations are primarily composed of Freddie Mac / Fannie Mae collateral, requiring lower loan funding capital due to the Agency guarantee than would be the case if originating non-Agency CMBS

Top Contributors to CMBS Deals [2]

	($ in millions)	9M Ended 9/30/2012	Annualized	Market Share
1	JP Morgan	$3,605	$4,807	12.9 %
2	Goldman Sachs	3,461	4,614	12.3
3	Morgan Stanley	2,652	3,536	9.5
4	UBS	2,462	3,282	8.8
5	Bank of America	2,441	3,254	8.7
6	Deutsche Bank	2,133	2,844	7.6
7	Wells Fargo	2,065	2,753	7.4
8	RBS	1,502	2,003	5.4
9	Citigroup	1,314	1,753	4.7
10	Cantor Fitzgerald	1,237	1,650	4.4
Top 10 Total		**$22,873**	**$30,497**	**81.7 %**

> Assuming 100% of Fannie Mae and Freddie Mac volumes went to the conduit market and MFI achieved a 12% market share, $10 billion of annual volume is a reasonable upper bound

Source: Commercial Mortgage Alert, Independent Barclays Research, Company filings.
1. Origination volumes by seller.
2. Collateral supplied to US securitizations backed by recently originated mortgages. Inclusive of Large Loan, Short Term, Single Borrower and Conduit / Fusion originations.
3. Per Walker & Dunlop investor presentation dated September 13, 2012, guidance for Q4 2012 origination volumes including the integrated CWCapital platform are expected to be between $2.2 billion and $3.1 billion. Figures shown have been annualized.

No G Origination Volumes Analysis (cont.)

Given higher funding costs and capitalization requirements, MFI will be at a pricing disadvantage to deposit-funded conduits

Deposit-Funded Conduit		No G MFI Conduit	
Bank-owned conduit funded through deposit base		Fund through warehouse facilities and term out in unwrapped securitizations	
Required Capital	10.0%	Required Capital	25.0%
Required ROE	12.5%	Required ROE	15.3%
Funding (Wholesale + Deposits) [2]	1.80%	Warehouse Margin	L+ 250
		Warehouse Advance Rate	75.0%
Gain on Sale	2.0%	Gain on Sale	2.0%
Required Asset Yield	**4.33%**	**Required Asset Yield**	**4.78%**

Assumptions / Metrics [1]

Commentary

- Deposits are a stable source of financing
- Depository asset generation appetite varies

- Dependent on wholesale funding
- Sensitive to market conditions
- Potential periods of market illiquidity

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1. *Required yield based on assumption that operating expenses are 1.6% of the average loan portfolio and tax rate of 35%. Gain on sales based on weighted average life of 10 years. Three month LIBOR of 0.3544%.*
2. *Based on average cost of funding of warehouse and deposits for WFC, JPM, BAC and C.*

HFI REIT Structure Overview

Barclays has assessed the potential for using a public commercial mortgage REIT to serve as an outlet for HFI loans

- Comparable commercial mortgage REITs on average yield ~10% return on equity

- A lack of available leverage on HFI loans reduces overall yield

  ‣ Generally, agency REITs achieve a 7.6x debt to equity ratio

- The sustainability of the REIT structure to serve as an outlet is also a concern

  ‣ Many legacy mortgage REITs have lost access to capital for extended periods and may in some instances have gone bankrupt

Commercial REIT Comparables

Market Data as of November 23, 2012
($ in millions, except per share)

	Market Value	Price / BV	Div Yield	Debt / Equity	Int. / Ext Mgt.
Commercial REITs					
Starwood Property Trust	$3,056	1.13 x	7.8 %	0.6 x	Ext.
CreXus Investment Corp.	951	1.04	10.3	0.0	Ext.
Colony Financial	809	1.08	7.1	0.1	Ext.
Apollo Commercial Real Estate Finance	461	1.01	9.7	0.7	Ext.
Ares Commercial Real Estate Corp.	149	0.89	6.2	0.3	Ext.
Legacy Commercial REITs					
Northstar Realty	844	1.33	10.9	5.5	Int.
iStar	655	0.84	0.0	2.5	Int.
Arbor Realty	162	0.71	8.5	6.1	Ext.
Gramercy Capital	156	NM	0.0	NM	Int.

REIT Analysis Assumptions (Refer to Next Slide for Analysis)

- The analysis assumes the following:

  ‣ Asset yield of 5%

  ‣ Target leverage ratio of 50%

  ‣ Funding cost of L + 250 bps

  ‣ Dividend payout ratio of 90%

  ‣ Ongoing equity issuance required to fund growth

HFI REIT Analysis

The illustrative feasibility analysis suggests that it would be difficult to achieve 10-15% ROE figures even under a REIT construct without significant additional leverage

Illustrative Balance Sheet

($ millions)

	12/31/13	12/31/14	12/31/15	12/31/16	12/31/17
Assets					
Cash	$28	$57	$84	$107	$128
Unsecuritized HFI	568	1,145	1,681	2,140	2,559
Total Assets	**$597**	**$1,202**	**$1,766**	**$2,247**	**$2,687**
Liabilities & Equity					
Debt	$298	$601	$883	$1,124	$1,344
Equity	298	601	883	1,124	1,344
Total Liabilities & Equity	**$597**	**$1,202**	**$1,766**	**$2,247**	**$2,687**
Debt to Capital	50%	50%	50%	50%	50%

Illustrative Income Statement

($ millions)

	12/31/13	12/31/14	12/31/15	12/31/16	12/31/17
Interest Income	$14	$43	$71	$96	$117
Interest Expense	(4)	(13)	(23)	(36)	(51)
Net Interest Income	$10	$30	$48	$59	$67
Provisions / (Benefit) for Losses	-	(1)	(2)	(5)	(9)
Net Interest Income After Provisions	$10	$29	$45	$54	$58
Application Fees	1	1	1	1	1
G&A Expenses	(3)	(3)	(4)	(5)	(6)
REO Expense	-	-	-	-	(0)
Net Income	$8	$26	$42	$50	$53
ROAE	2.7%	4.3%	4.7%	4.5%	4.0%
Dividends	($7)	($23)	($38)	($45)	($48)
Dividend Yield at 1.0x Book Value	4.8%	5.2%	5.1%	4.5%	3.9%

Sensitivity Analysis of Leverage and Asset Yield

- *Achieving significant leverage on these assets would be challenging and without significant increases to asset yields, returns to REIT investors are not attractive*

2013E Dividend

		Asset Yield				
		5.0%	5.5%	6.0%	6.5%	7.0%
		-	+50 bps	+100bps	+150bps	+200bps
Leverage	0.0%	3.7%	4.1%	4.6%	5.0%	5.4%
	12.5%	3.9%	4.4%	4.8%	5.3%	5.8%
	25.0%	4.1%	4.7%	5.2%	5.8%	6.4%
	37.5%	4.4%	5.1%	5.8%	6.4%	7.1%
	50.0%	4.8%	5.7%	6.6%	7.4%	8.3%

2017E Dividend

		Asset Yield				
		5.0%	5.5%	6.0%	6.5%	7.0%
		-	+50 bps	+100bps	+150bps	+200bps
Leverage	0.0%	3.8%	4.2%	4.6%	5.1%	5.5%
	12.5%	3.8%	4.3%	4.8%	5.3%	5.8%
	25.0%	3.8%	4.4%	5.0%	5.5%	6.1%
	37.5%	3.8%	4.5%	5.2%	5.9%	6.6%
	50.0%	3.9%	4.7%	5.6%	6.4%	7.3%

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Financial Model Summary Output

As detailed in the Appendix, below is a side-by-side summary comparison of financial projections

($ millions)	Guarantee Scenario *Engaged in HFS, Guarantee, HFI and Portfolio Mgmt. businesses*					No G Scenario *Engaged in HFS and Portfolio Mgmt. businesses*				
	Year 1 12/31/13	Year 2 12/31/14	Year 3 12/31/15	Year 4 12/31/16	Year 11 12/31/23	Year 1 12/31/13	Year 2 12/31/14	Year 3 12/31/15	Year 4 12/31/16	Year 11 12/31/23
Inputs										
Total Origination Volumes	**$24,167**	**$24,833**	**$25,519**	**$26,226**	**$30,411**	**$5,888**	**$5,991**	**$6,095**	**$6,202**	**$6,882**
K-Series / CMBS Loans Sold	23,530	24,124	24,728	25,381	28,859	6,041	6,132	6,224	6,325	6,882
Gain on Sale of Loans via K-Series / CMBS	2.0%	2.0%	2.0%	2.0%	2.0%	3.0%	2.5%	2.0%	2.0%	2.0%
Summary Balance Sheet										
Mortgage Loans, Net of Reserve	$7,793	$7,774	$7,765	$7,697	$9,335	$1,340	$1,191	$1,057	$929	$897
Guarantee Asset, at Fair Value	527	628	708	765	762	-	-	-	-	-
Total Assets	$11,517	$11,775	$12,265	$12,584	$15,195	$1,780	$1,603	$1,540	$1,423	$1,402
Repo (Trading Securities)	$1,455	$1,337	$1,427	$1,450	$1,757	$308	$282	$348	$358	$368
Warehouse (HFS)	5,924	5,437	4,991	4,562	4,405	965	858	761	669	646
HFI Conduit	267	538	790	1,006	1,877	-	-	-	-	-
Term ABS (Unsub K-Series)	-	-	-	-	-	-	-	-	-	-
Total Debt	$7,646	$7,312	$7,209	$7,017	$8,039	$1,273	$1,140	$1,109	$1,027	$1,014
Total Liabilities	$8,267	$8,034	$8,013	$7,883	$8,918	$1,278	$1,145	$1,114	$1,031	$1,019
Stockholders' Equity	$3,250	$3,741	$4,252	$4,701	$6,278	$502	$458	$426	$391	$383
Equity / Assets	*28.2%*	*31.8%*	*34.7%*	*37.4%*	*41.3%*	*28.2%*	*28.6%*	*27.7%*	*27.5%*	*27.3%*
Debt / Equity	***2.4x***	***2.0x***	***1.7x***	***1.5x***	***1.3x***	***2.5x***	***2.5x***	***2.6x***	***2.6x***	***2.6x***
Summary Income Statement										
Net Interest Income	$259	$289	$311	$329	$435	$57	$59	$61	$63	$62
Guarantee Fees	85	111	140	167	254	-	-	-	-	-
Portfolio Management Fees	158	126	93	76	64	158	126	93	76	64
Gains on Sale of Mortgage Loans	471	482	495	508	577	181	153	124	127	138
Other Non-Interest Income	36	31	30	31	32	6	6	6	6	7
Net Income	**$450**	**$490**	**$520**	**$553**	**$662**	**$142**	**$125**	**$103**	**$108**	**$109**
Growth	*-*	*8.9%*	*6.1%*	*6.3%*	*0.2%*	*-*	*(12.5%)*	*(17.3%)*	*4.6%*	*(2.3%)*
ROAA	*4.0%*	*4.2%*	*4.3%*	*4.5%*	*4.4%*	*7.9%*	*7.4%*	*6.6%*	*7.3%*	*7.7%*
ROAE	***14.9%***	***14.0%***	***13.0%***	***12.4%***	***10.7%***	***28.4%***	***26.0%***	***23.3%***	***26.4%***	***28.3%***

Note: Any estimates and projections have been prepared by or in consultation with Freddie Mac management, were obtained from publicly available sources, or are based upon such estimates and projections.

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Valuation Approach

Barclays has employed several techniques in assessing the value of MFI

Public Comparables

- Indicates where similar companies trade in the public markets on a Price to Earnings ("P / E") and Price to Book value ("P / B") basis

Price / Earnings

Price / Book Value

- There are limited public comparable companies
  ‣ Used a blend of specialty finance companies, regional banks and commercial REITs as comparables
  ‣ Considered historical relative trading multiples of GSEs over time to public comparables

Discounted Cash Flow ("DCF")

- Assumes capital generated in excess of required equity is paid out as dividends

- Terminal value calculated based on implied P / B multiple

- Applies midpoint cost of equity of 11.0% for the Guarantee and 15.3% for the No G scenarios
  ‣ Cost of equity range: Traditional Capital Asset Pricing Model (CAPM) formula serves as basis for lower end of the range while an Implied Cost of Equity based on volatility drivers serves as the high end of our range

Price / Book Value to ROTCE Regression

- Regressed P / B multiple against return on tangible common equity (ROTCE) for peer set

- Based on regression equation, we can imply the expected P / B value multiple for a company with MFI's ROTCE profile

Sum of the Parts

- Isolated business segments so as to assess their individual earnings and contribution to overall MFI business valuation
  ‣ Applied different valuation methodologies based on segment characteristics

Precedent Transactions

- Relevant precedent transactions are limited

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Valuation Summary

Below is a summary and rationale of the various valuation components presented on the following slides

Guarantee Scenario

- **Initial equity contribution:** $2.8 billion

Valuation range:

- Gross value: $4.5 to $6.0 billion

- Net value to Freddie Mac: $1.7 to $3.2 billion

- Multiple of invested capital: 1.6x to 2.1x

Rationale:

- Valuation methodologies result in fairly consistent ranges

- Emphasis is placed on the sum of the parts analysis due the varying characteristics of each business line

- There is less downside risk in valuation in an adverse operating environment

No G Scenario

- **Initial equity contribution:** $500 million

Valuation range:

- Gross value: $850 million to $1.0 billion

- Net value to Freddie Mac: $350 to $500 million

- Multiple of invested capital: 1.7x to 2.0x

Rationale:

- Emphasis is placed on multiple of book value

  ‣ Nearest comparable (Walker & Dunlop) is trading on a price / book value basis

    – However, Walker & Dunlop operates with the benefit of Freddie Mac and Fannie Mae take-out

  ‣ Transaction multiples reflect modest premium to book value

- Investors are likely to discount very high ROEs, so regression analysis is de-emphasized

- Potential significant downside risk in valuation in an adverse operating environment

Valuation Summary (cont.)

Below is a summary and rationale of the various valuation components for the additional other scenarios

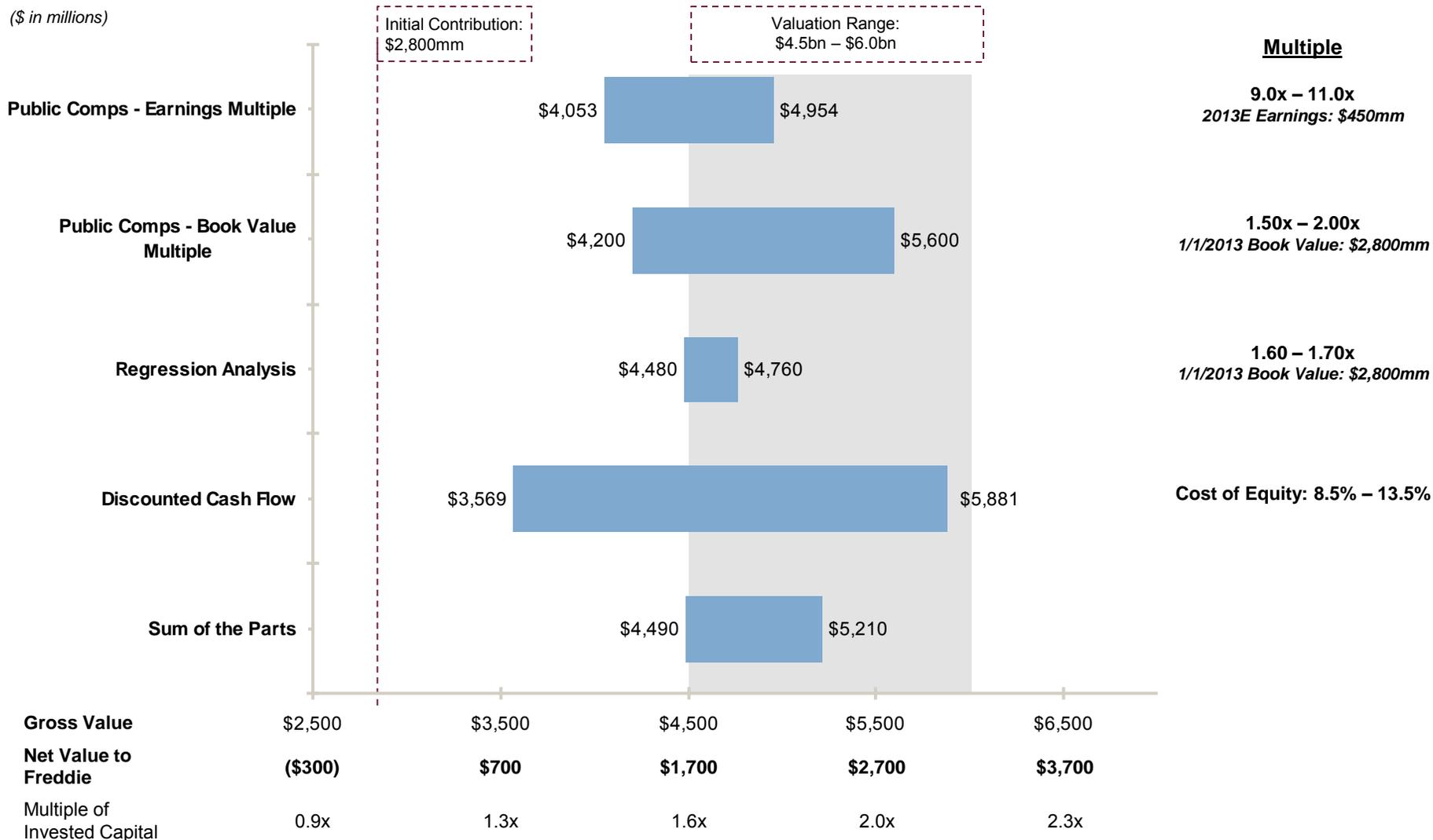| G on Affordable	G Phase Out	G Available to Qualified Players
▪ **Initial equity contribution:** $1.6 billion	▪ **Initial equity contribution:** $2.7 billion	▪ **Initial equity contribution:** $2.7 billion

G on Affordable

Valuation range:

- Gross value: $2.1 to $2.7 billion
- Net value to Freddie Mac: $0.5 to $1.1 billion
- Multiple of invested capital: 1.3x to 1.7x

Rationale:

- Though smaller in size, similar business stability as Guarantee Scenario
- Less downside risk in adverse operating environment

G Phase Out

Valuation range:

- Gross value: $3.6 to $4.2 billion
- Net value to Freddie Mac: $0.9 to $1.5 billion
- Multiple of invested capital: 1.3x to 1.6x

Rationale:

- Similar earnings' multiples to Guarantee Scenario given the relatively long sunset on guarantee
- Would impact / "shock" the market less than an immediate phase out

G Available to Qualified Players

Valuation range:

- Gross value: $3.3 to $4.2 billion
- Net value to Freddie Mac: $0.6 to $1.5 billion
- Multiple of invested capital: 1.2x to 1.6x

Rationale:

- Minor discount on earnings' multiple

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Guarantee Scenario Valuation

Valuation Summary

($ in millions)

	Initial Contribution: $2,800mm	Valuation Range: $4.5bn – $6.0bn	**Multiple**

Public Comps - Earnings Multiple — $4,053 to $4,954 — **9.0x – 11.0x** *2013E Earnings: $450mm*

Public Comps - Book Value Multiple — $4,200 to $5,600 — **1.50x – 2.00x** *1/1/2013 Book Value: $2,800mm*

Regression Analysis — $4,480 to $4,760 — **1.60 – 1.70x** *1/1/2013 Book Value: $2,800mm*

Discounted Cash Flow — $3,569 to $5,881 — **Cost of Equity: 8.5% – 13.5%**

Sum of the Parts — $4,490 to $5,210

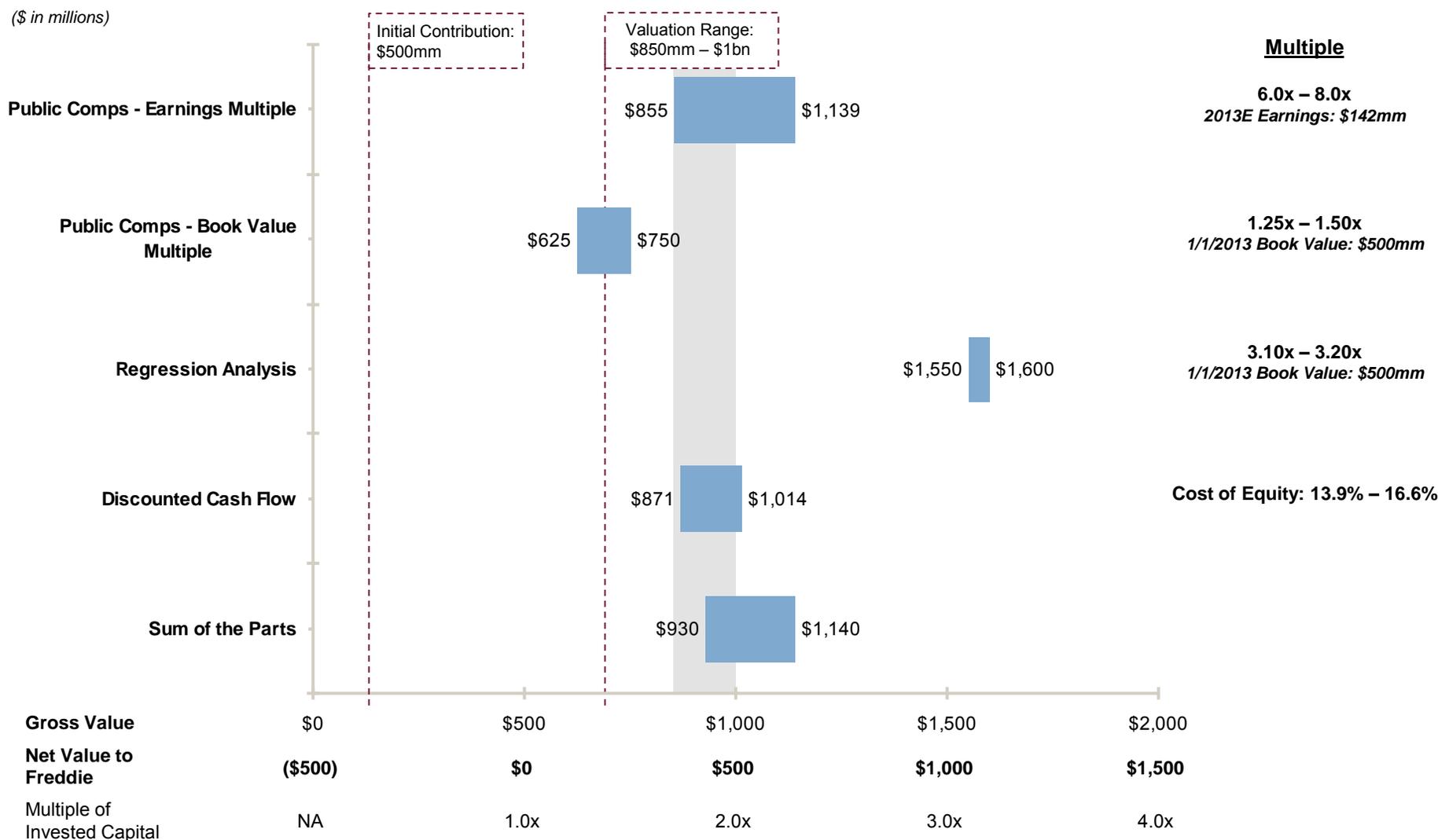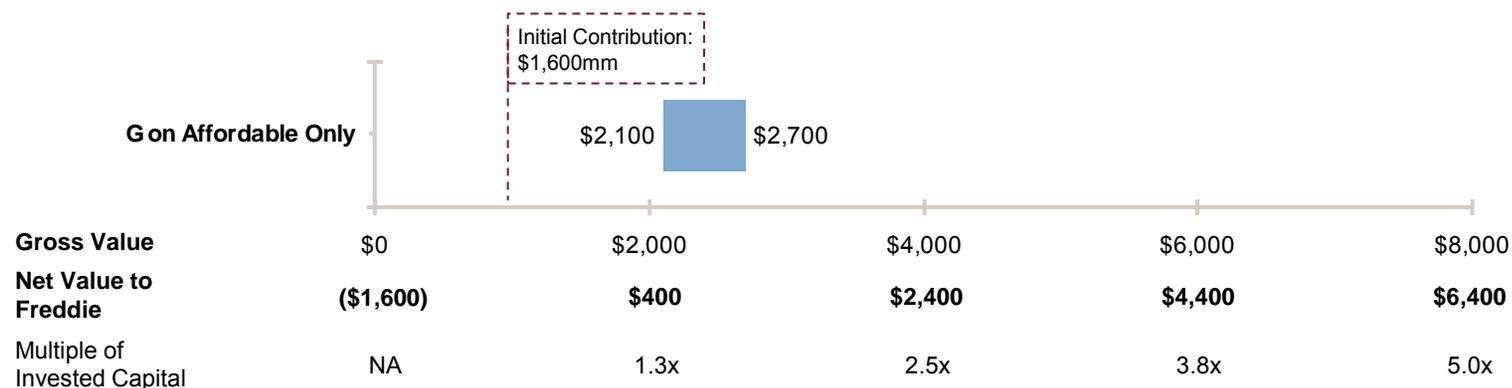| Gross Value	$2,500	$3,500	$4,500	$5,500	$6,500
Net Value to Freddie	**($300)**	**$700**	**$1,700**	**$2,700**	**$3,700**
Multiple of Invested Capital	0.9x	1.3x	1.6x	2.0x	2.3x

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The above information represents a summary of Appendix G: Valuation and should be considered along with the appendix support section.
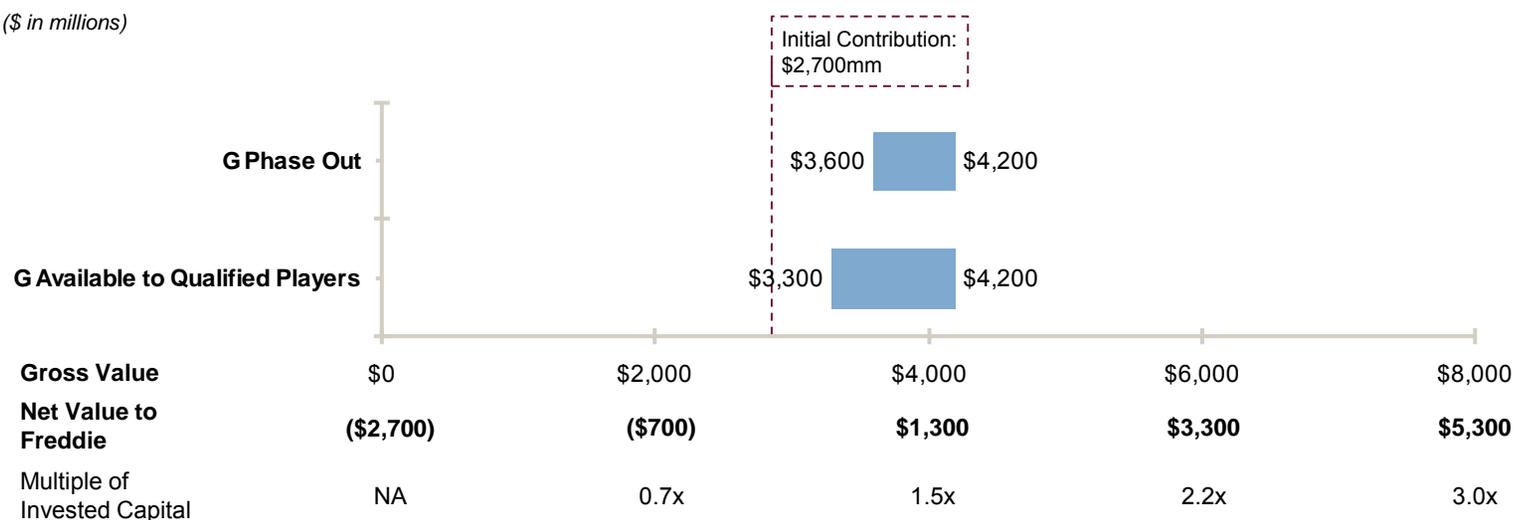
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No G Scenario Valuation

Valuation Summary

($ in millions)

Initial Contribution: $500mm

Valuation Range: $850mm – $1bn

Multiple

Category	Values	Multiple
Public Comps - Earnings Multiple	$855 – $1,139	**6.0x – 8.0x** *2013E Earnings: $142mm*
Public Comps - Book Value Multiple	$625 – $750	**1.25x – 1.50x** *1/1/2013 Book Value: $500mm*
Regression Analysis	$1,550 – $1,600	**3.10x – 3.20x** *1/1/2013 Book Value: $500mm*
Discounted Cash Flow	$871 – $1,014	**Cost of Equity: 13.9% – 16.6%**
Sum of the Parts	$930 – $1,140	

Gross Value	$0	$500	$1,000	$1,500	$2,000
Net Value to Freddie	**($500)**	**$0**	**$500**	**$1,000**	**$1,500**
Multiple of Invested Capital	NA	1.0x	2.0x	3.0x	4.0x

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Other Scenarios Valuation

Valuation Summary – G on Affordable

Initial Contribution: $1,600mm

G on Affordable Only — $2,100 / $2,700

Gross Value	$0	$2,000	$4,000	$6,000	$8,000
Net Value to Freddie	($1,600)	$400	$2,400	$4,400	$6,400
Multiple of Invested Capital	NA	1.3x	2.5x	3.8x	5.0x

Valuation Summary – G Phase Out & Qualified Players

($ in millions)

Initial Contribution: $2,700mm

G Phase Out — $3,600 / $4,200

G Available to Qualified Players — $3,300 / $4,200

Gross Value	$0	$2,000	$4,000	$6,000	$8,000
Net Value to Freddie	($2,700)	($700)	$1,300	$3,300	$5,300
Multiple of Invested Capital	NA	0.7x	1.5x	2.2x	3.0x

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No G Scenario – Stress Test

Executive Summary

Barclays applied several stress cases to evaluate the impact on the No G business model

Assumptions (Refer to Next Slide for Analysis)

- Throughout this presentation, we assume a "normal" operating environment. However, a key consideration is the impact of the stability of the business model in a downturn

- The analysis primarily tests liquidity and does not take into account any regulatory capital considerations as the Federal Reserve Board's stress tests do

- Per Freddie Mac guidance, the analysis assumes that in a downturn scenario, MFI would reduce originations to $2 billion per annum during the stress period

  ‣ $2 billion of originations represents the amount of loans in MFI's pipeline at the beginning of the stress period the Company would feel compelled to close

  ‣ Per discussion with Freddie Mac team, the potential gain on sale on $2 billion of originations would also roughly cover G&A expenses for the HFS business

- Separately, we assume the portfolio management business would not be impacted in a downturn scenario

- We would note that we don't believe these types of liquidity events are likely under the Guarantee Scenario

- **General assumptions:**

  ‣ One year of market downturn that occurs in calendar year 2017

    – 2017 was chosen as business is fully ramped and profitability has normalized

  ‣ Liquidity driven event

  ‣ 10% decrease in warehouse advance rates from 75% to 65% across cases

  ‣ All assumptions apply only to the stress test year

  ‣ Warehouse lines remain in place, though advance rates are lowered to account for mark-to-market impact

- **Stress Case 1:** Assumes 50% of CMBS issuance in the "normal" environment and no asset sales as business is able to access the markets to issue new equity

- **Stress Case 2:** Assumes that there is no market for CMBS issuance and no asset sales as business is able to access the markets to issue new equity

- **Stress Case 3:** Assumes that there is no market for CMBS issuance, but the need to fund the equity hole in the stress year created by the decrease in advance rates and lack of market access is met by selling assets at 85 cents on the dollar

No G Scenario – Stress Test (cont.)

Illustrative Stress Case Analysis

($ in millions)

	"Normal" Environment	Stress Case 1	Stress Case 2	Stress Case 3
Originations	$6,000	$2,000	$2,000	$2,000
CMBS Issuance (% of Originations)	100%	50%	0%	0%
Decrease in Warehouse Advance Rate	--	10%	10%	10%
HFS Ending Balance	$900	$1,900	$2,900	$2,000
Asset Sales to Fill Equity Hole	None	None	None	$988
Asset Sale Price	--	--	--	85 cents on $1.00
Equity Schedule				
Beginning Equity Balance	$391	$978	$391	$391
Stress Year Net Income	115	45	38	(61)
Equity Issuance / (Dividends)	(116)	(181)	792	529
Total Equity Required in Stress Year	$390	$842	$1,222	$859
Δ in Market Capital Shortfall from Normal Env.	--	($65)	$909	$645

Observations

- A large quantum of capital is required in all stress scenarios

- In the event that an asset sale is required at distressed levels (i.e., 85 cents on the dollar), similar to Stress Case 3, the capital shortfall is muted by the sales; however, there is still a significant impact on the business

- Assuming that the analysis only takes into account a potential liquidity event, incremental capital would be necessary in the case of a credit event

  ▸ In a credit event, funding costs would rise and lenders may pull back on funding

- A key consideration for investors may be whether MFI should increase its equity cushion in preparation of a downturn scenario

- Perhaps most importantly, investors may question the business model's ability to survive a stress case

Note: Assumes warehouse lines remain in place.
Any estimates and projections have been prepared by or in consultation with Freddie Mac management, were obtained from publicly available sources, or are based upon such estimates and projections.

Appendices

Scope of Work Included

Work Performed to Date

Since being mandated in July, Barclays has performed the following work:

- Held due diligence calls with Freddie Mac to deepen our understanding of various drivers of the Freddie Mac multifamily business and general CMBS market, including:

  ▸ The interplay between Freddie Mac's multifamily products (e.g., the impact of affordable housing on K-Series volumes) and their importance in the go-forward business structure

  ▸ Key value drivers of the business model and their alignment to select government policies (e.g., volumes, operating expenses, capital structure, guarantee fee)

  ▸ Potential ancillary business opportunities complementary to Freddie Mac's current multifamily competencies

  ▸ Potential capital structure alternatives (funding costs, equity capital, etc.)

- Built a 10-year projection model based on Freddie Mac's preliminary multifamily projections

- Layered in capital and funding structures based on current market views of appropriate capital structure, advance rates, regulatory capital and costs

Scenarios

Barclays has engaged in regular dialogue with the Freddie Mac multifamily team regarding the range of proposed scenarios for MFI

- Assessed the two primary scenarios (Guarantee and No G)

  ▸ We believe these two scenarios provide the necessary framework to then analyze the alternatives

- Stress tested the No G scenario as operating environment is a key consideration of the stability of the business model

Note: Any estimates and projections have been prepared by or in consultation with Freddie Mac management, were obtained from publicly available sources, or are based upon such estimates and projections.

Due Diligence

Barclays has performed initial due diligence with the Freddie Mac multifamily team incorporating key Barclays internal experts to inform our analysis

Operating Model
- Reviewed Freddie Mac's preliminary multifamily projections as basis for model inputs
- Conducted calls with Freddie Mac team to understand assumptions
  ‣ Identified and analyzed key business drivers

Volume and G&A Forecasts
- Reviewed initial and updated volume forecasts provided by Freddie Mac
- Participated in multiple conference calls to diligence assumptions under select scenarios

Business Model / Products
- Held calls with Freddie's multifamily team regarding various products and business lines including:
  ‣ Current form K-Series and Unsubordinated K-Series
  ‣ Trading securities (A-Certificates, Interest Only securities ("IOs"), other trading securities in the No G scenario)
  ‣ HFI Portfolio
- Diligenced materials provided by Freddie Mac including the Multifamily Segment Results, Freddie Mac's Draft Progress Briefing Board Presentation and Freddie Mac's Corporate New Business Initiative for Unsubordinated K-Series
- Diligenced Freddie Mac-provided operating expenses for each scenario

Capital Structures
- Incorporated views from across Barclays product groups including in Securitized Products Origination, CMBS Origination and Fixed Income Repo Desk in order to assess funding structure alternatives for MFI
- Barclays Capital Advisory and Securitized Products Research teams have provided their market views on risk weightings of assets and the regulatory capital requirements for MFI's portfolio and guarantee obligations under various scenarios

Gain on Sale ("GoS")
- Conducted calls with Securitized Products Research colleagues regarding appropriate GoS margins for MFI

Other
- Barclays Ratings Advisory team has assessed the potential ratings profile of MFI under various structures and have considered factors that would impact ratings as well as the effects of changes in MFI's ratings
- Barclays will continue diligencing the appropriate guarantee fee pricing based on market views balancing risk and return
- Our Investment Banking – Asset Management practice and CMBS desk have analyzed portfolio management fees

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Assumptions Detail

Model Assumptions

The categories below represent the main drivers of the model across the primary scenarios

	Guarantee Scenario	No G Scenario
Origination Volume	■ Assumed Freddie Mac-provided origination volumes ■ Excluded PC Swaps from model as amounts were minimal and, per discussions with Freddie Mac, not part of the anticipated go-forward business ■ Assumed no transition period for origination volume ■ January 1, 2013 balance sheet seeded with $7.9bn of HFS and $1.2bn of trading securities [1]	■ Assumed Freddie Mac-provided origination volumes ■ Does not incorporate consolidated unsubordinated K-Series originations ■ Excluded PC Swaps from model as amounts were minimal and, per discussions with Freddie Mac, not part of the anticipated go-forward business ■ Assumed no transition period for origination volume ■ January 1, 2013 balance sheet seeded with $1.5bn of HFS and $0.3bn of trading securities [1]
Gain on Sale	■ Assumed Freddie Mac-provided GoS of 2%	■ 3% GoS based on limited supply dynamics; return to 2% steady state
Operating Expenses	■ Assumed Freddie Mac-provided operating expenses broken down by scenario and product	■ Assumed Freddie Mac-provided operating expenses broken down by scenario and product
Guarantee Fee	■ Assumed 25 bps guarantee fee for non-legacy K-Deals per discussion with Freddie Mac ■ Assumed Freddie Mac-provided guarantee fees / payment amounts for TEBs and CE Bonds ■ Considered alternative fee structures and pricing due to low returns of guarantee business on standalone basis	■ None ■ Assumed no legacy portfolio to guarantee
Cost of Funds	■ Warehouse (HFS): L+225 bps, 15% equity financing ■ Repo (Trading Securities): L+50 bps, 5% equity ■ Conduit (HFI): L+400 bps, 50% equity ■ Backup Liquidity Facility: L+50 bps, 95% advance; 25 bps undrawn fee ■ Equity cushion of 3% on advance rates	■ Warehouse (HFS): L+250 bps, 25% equity financing, or 67% higher than Guarantee scenario ■ Repo (Trading Securities): L+50 bps, 5% equity ■ Conduit (HFI): L+400 bps, 50% equity ■ Equity cushion of 3% on advance rates

Equity Capital	■ Greater of regulatory capital and market imposed haircuts
	  ▸ Initial capital infusion modeled to avoid subsequent capital raises
	■ Risk-weightings:
	  ▸ Commercial Real Estate ("CRE") loans: 100%
	  ▸ Agency-wrapped securities: 20%
	  ▸ Agency wrapped IOs: 100%
	■ Required capital of 10% for all risk-weighted assets
	■ Assume guarantee segment capital is "ring-fenced"
		■ Greater of regulatory capital and market imposed haircuts
		  ▸ Initial capital infusion modeled to avoid subsequent capital raises
		■ Required capital of 10% for all risk-weighted assets

Note: Any estimates and projections have been prepared by or in consultation with Freddie Mac management, were obtained from publicly available sources, or are based upon such estimates and projections.
1. *Assumes opening balance sheet seeded with fully ramped multifamily assets exhibiting the characteristics of the go-forward business for 2013E earnings valuation purposes.*

Gain on Sale

Barclays has used Freddie Mac's 2% GoS assumption to reflect "normalized" conditions while in the No G scenario, GoS reflects short-term dislocation in the multifamily market with a near immediate return to normalization

Gain on Sale Under Various Scenarios											
Scenario	2013E	2014E	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E
Guarantee	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
No G	3.0%	2.5%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
G on Affordable	3.0%	2.5%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
G Phase Out	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.3%	2.7%	3.0%
G Available to Qual Players	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.3%	2.7%	3.0%

Commentary

- Forecasts provided by Freddie Mac show a flat 2% GoS through the projection period under the Guarantee

  ‣ Barclays has diligenced this assumption with our CMBS and Securitized Products Research teams

- In the event the guarantee is removed immediately or is only placed on affordable housing, we expect a short-term dislocation in the multifamily CMBS market and an overall withdrawal of volume from the market

  ‣ Disconnect between capacity and demand will cause spreads to widen significantly

  ‣ Multifamily cap rates may potentially be impacted

- After a very short-term spike in GoS of 3%, we expect a return to normalization

  ‣ Freddie Mac 2% GoS assumption assumed for normalized market condition in long-run as the market recalibrates to a new supply / demand equilibrium

  ‣ Assumes similar termination of guarantee occurs at Fannie Mae

- In the G Phase Out and G Available to Qual Players scenarios, we expect a gradual rise in guarantee fees as demand is unmet by lack of market participants with the capacity to support such volumes

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Operating Expenses

Expenses generally decrease due to lower volumes in the No G scenario while expenses increase as a result of a growing HFS portfolio in the Guarantee scenario

Summary

- The analysis is based on operating expense analysis provided by Freddie Mac

- Businesses that are not economically viable are not taken into account and therefore, do not incur operating expenses

- 2023 grows at the same rate as 2021 and 2022 for each business segment

- Portfolio Management related expenses from post-2017 are equivalent to 2017 as a result of stabilizing the available for sale securities portfolio at $25bn

Guarantee Scenario

($ in millions)	2013E	2014E	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E
HFS	$75	$94	$111	$127	$142	$153	$164	$174	$184	$195	$206
Guarantee Portfolio	3	4	5	6	7	7	8	8	9	10	10
HFI	3	3	4	5	6	6	6	7	7	8	8
Consolidated Unsub K-Series	-	-	-	-	-	-	-	-	-	-	-
Portfolio Management	154	117	87	65	48	48	48	48	48	48	48
Total Operating Expenses	**$234**	**$218**	**$207**	**$202**	**$203**	**$215**	**$227**	**$238**	**$249**	**$261**	**$273**
% Growth	*(2.4%)*	*(6.9%)*	*(5.0%)*	*(2.4%)*	*0.3%*	*6.1%*	*5.3%*	*5.1%*	*4.4%*	*4.8%*	*4.8%*

No G Scenario

($ in millions)	2013E	2014E	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E
HFS	$21	$25	$30	$34	$38	$40	$41	$44	$45	$47	$49
Guarantee Portfolio	-	-	-	-	-	-	-	-	-	-	-
HFI	-	-	-	-	-	-	-	-	-	-	-
Consolidated Unsub K-Series	-	-	-	-	-	-	-	-	-	-	-
Portfolio Management	152	118	89	67	49	49	49	49	49	49	49
Total Operating Expenses	**$173**	**$143**	**$119**	**$100**	**$87**	**$89**	**$91**	**$93**	**$95**	**$96**	**$98**
% Growth	*(27.6%)*	*(17.0%)*	*(17.1%)*	*(15.6%)*	*(13.3%)*	*2.5%*	*1.9%*	*2.4%*	*1.8%*	*1.7%*	*1.8%*

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Funding Structure and Terms

Barclays has refined Freddie Mac's cost of funds assumptions based on feedback provided by our internal product group partners

Summary 2013 Capital Structure

	Guarantee	No G
Debt		
Warehouse (HFS)	54.4 %	54.4 %
Repo (Trading Securities)	13.4	17.4
HFI Conduit	2.5	-
Total Debt	70.2 %	71.7 %
Shareholders' Equity	29.8 %	28.3 %
Total Capitalization	100.0 %	100.0 %
Debt / Equity	*2.4x*	*2.5x*

Cost of Funds

	Guarantee	No G
Cost of Funds		
Warehouse (HFS)	L+ 225 bps	L+ 250 bps
Repo (Trading Securities)	L+ 50 bps	L+ 50 bps
HFI Conduit	L+ 400 bps	L+ 400 bps
Term ABS (Unsub K-Series)	3.50% - 4.23%	3.50% - 4.23%
Backup Liquidity Facility	L+ 50 bps	NA
Market Capital Required		
Repo (Trading Securities)	5.0%	5.0%
Warehouse (HFS)	15.0%	25.0%
HFI Conduit	50.0%	50.0%
Advance Rate		
Backup Liquidity Facility	95.0%	NA

Commentary

- Assumed a 100% third-party funded balance sheet beginning January 1, 2013

- No G scenario will require more equity as a percentage of total capitalization, which will impact overall cost of capital

- Trading Securities likely can be funded more efficiently than contemplated in the Freddie Mac preliminary multifamily projections

  ‣ Liquid, marketable nature of trading securities makes for adequate repo collateral

- HFS warehouse terms would likely price inside of Freddie Mac preliminary multifamily projections

  ‣ Advance rates in the 80% – 85% range, roughly in line with Freddie's preliminary projections under Guarantee scenario

  ‣ In No G scenario, pricing remains similar to Freddie projections, but advance rate falls to 75%

- Funding the HFI portfolio poses the largest challenge in developing MFI's capital structure

  ‣ Current business plan does not contemplate an actionable take-out for any MFI funding facility

  ‣ Securitization takeout would significantly enhance the asset / liability match of the balance sheet, a positive for valuation

- 25 bps undrawn fee on the backup liquidity facility using the midpoint of Freddie Mac's $5-6 billion backup facility requirement

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1. *Based on Freddie Mac preliminary projection model assuming non-parent debt only.*

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Equity Capital

Assumptions Detail

Barclays believes that MFI will need to hold a significant amount of capital in the Guarantee scenario based on both regulatory capital and market funding requirements

Assumptions

- Assumes the entity will be regulated; the analysis considers Basel III capital requirements

- Equity capital is assumed to be the greater of:

  ‣ Regulatory capital

  ‣ The required market capital that must be held given advance rates on financing facilities plus an equity cushion of 3%

- Market funding requirements are more conservative than regulatory capital requirements in both Bookend scenarios as currently modeled

Required Market Capital in Guarantee

($ millions)	Rates [2]	1/1/13	12/31/13	12/31/14	12/31/15	12/31/16	12/31/17	12/31/18	12/31/19	12/31/20	12/31/21	12/31/22	12/31/23
Total Assets [1]		$9,632	$10,084	$10,033	$10,199	$10,211	$10,708	$11,083	$11,348	$11,618	$11,815	$12,060	$12,195
Less: Term ABS (Unsub K-Series)		-	-	-	-	-	-	-	-	-	-	-	-
Less: Repo (Trading Securities)	92%	(1,139)	(1,455)	(1,337)	(1,427)	(1,450)	(1,521)	(1,593)	(1,606)	(1,672)	(1,683)	(1,748)	(1,757)
Less: Warehouse (HFS), at Fair Value	82%	(6,443)	(5,924)	(5,437)	(4,991)	(4,562)	(4,539)	(4,516)	(4,494)	(4,471)	(4,449)	(4,427)	(4,405)
Less: HFI Conduit	47%	-	(267)	(538)	(790)	(1,006)	(1,203)	(1,359)	(1,497)	(1,617)	(1,720)	(1,810)	(1,877)
Less: Total Other Liabilities		(537)	(621)	(722)	(804)	(866)	(901)	(900)	(890)	(868)	(862)	(872)	(879)
Market Capital Required		**$1,513**	**$1,817**	**$1,999**	**$2,186**	**$2,327**	**$2,544**	**$2,715**	**$2,861**	**$2,990**	**$3,102**	**$3,204**	**$3,277**
% Assets		14%	16%	17%	18%	18%	19%	20%	20%	21%	21%	21%	22%

Note: Any estimates and projections have been prepared by or in consultation with Freddie Mac management, were obtained from publicly available sources, or are based upon such estimates and projections.
1. *Includes minimum cash requirement.*
2. *Advance rates are net of 3% cushion.*

Equity Capital (cont.)

Assumes 10% regulatory capital requirements against MFI's risk weighted assets

Regulatory Capital in Guarantee													
($ millions)	Weight	1/1/13	12/31/13	12/31/14	12/31/15	12/31/16	12/31/17	12/31/18	12/31/19	12/31/20	12/31/21	12/31/22	12/31/23
Retained Portfolio - MFI													
Trading Securities - A-Certs	20%	$190	$229	$190	$200	$200	$210	$220	$220	$230	$230	$240	$240
Trading Securities - IO FV	100%	288	435	503	551	576	603	631	646	668	679	699	710
Trading Securities	100%	$478	$665	$693	$751	$776	$813	$851	$866	$898	$909	$939	$950
Unsecuritized HFI	100%	-	568	1,145	1,681	2,140	2,559	2,892	3,185	3,440	3,660	3,850	3,994
HFS, at Fair Value	100%	7,858	7,225	6,631	6,087	5,563	5,536	5,508	5,480	5,453	5,426	5,399	5,372
Total Retained Portfolio		$8,336	$8,457	$8,468	$8,520	$8,479	$8,907	$9,251	$9,531	$9,791	$9,995	$10,188	$10,315
Guarantee Portfolio - MFI													
Consolidated Unsub K-Series	100%	-	-	-	-	-	-	-	-	-	-	-	-
CE Bonds	20%	-	98	197	296	391	470	537	601	660	716	768	815
TEBS	20%	-	25	50	74	98	118	134	150	165	179	192	204
K-Deals	20%	-	4,036	8,105	12,115	15,511	18,391	20,931	23,097	24,865	26,251	27,539	28,648
Total Guarantee Portfolio		-	$4,159	$8,352	$12,485	$16,000	$18,979	$21,603	$23,848	$25,690	$27,145	$28,500	$29,667
Guarantee Portfolio - Legacy													
CE Bonds	20%	$2,106	$1,609	$1,352	$1,149	$965	$811	$673	$559	$458	$376	$308	$253
TEBS	20%	699	534	449	381	320	269	223	185	152	125	102	84
K-Deals	20%	7,131	6,990	6,850	6,645	6,445	5,801	4,060	2,964	1,037	-	-	-
Total Guarantee Portfolio		$9,936	$9,133	$8,651	$8,175	$7,731	$6,881	$4,957	$3,708	$1,647	$500	$410	$336
Total Risk-Weighted Assets		**$18,271**	**$21,749**	**$25,471**	**$29,179**	**$32,210**	**$34,767**	**$35,811**	**$37,087**	**$37,128**	**$37,640**	**$39,098**	**$40,319**
Regulatory Capital Required	10%	**$1,827**	**$2,175**	**$2,547**	**$2,918**	**$3,221**	**$3,477**	**$3,581**	**$3,709**	**$3,713**	**$3,764**	**$3,910**	**$4,032**
% Assets		17%	19%	22%	24%	26%	26%	26%	26%	26%	26%	26%	27%

Note: Precise risk weights will be defined by the SSFA under U.S. regulators' Basel III NPR. Any estimates and projections have been prepared by or in consultation with Freddie Mac management, were obtained from publicly available sources, or are based upon such estimates and projections.

Equity Capital (cont.)

In the No G scenario, we assume MFI would not be regulated and thus would no longer be required to hold regulatory capital. However, the market would require MFI to hold significant capital

	Required Market Capital in No G												
($ millions)	**Rates** [2]	**1/1/13**	**12/31/13**	**12/31/14**	**12/31/15**	**12/31/16**	**12/31/17**	**12/31/18**	**12/31/19**	**12/31/20**	**12/31/21**	**12/31/22**	**12/31/23**
Total Assets [1]		$1,770	$1,780	$1,603	$1,540	$1,423	$1,424	$1,422	$1,419	$1,415	$1,411	$1,407	$1,402
Less: Term ABS (Unsub K-Series)		-	-	-	-	-	-	-	-	-	-	-	-
Less: Repo (Trading Securities)	92%	(243)	(308)	(282)	(348)	(358)	(363)	(366)	(367)	(367)	(368)	(368)	(368)
Less: Warehouse (HFS), at Fair Value	72%	(1,080)	(965)	(858)	(761)	(669)	(665)	(662)	(659)	(655)	(652)	(649)	(646)
Less: HFI Conduit	47%	-	-	-	-	-	-	-	-	-	-	-	-
Less: Total Other Liabilities		(6)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(6)	(6)	(6)
Market Capital Required		**$441**	**$502**	**$458**	**$426**	**$391**	**$390**	**$389**	**$388**	**$387**	**$386**	**$384**	**$383**
% Assets		24%	28%	29%	28%	27%	27%	27%	27%	27%	27%	27%	27%

Note: Any estimates and projections have been prepared by or in consultation with Freddie Mac management, were obtained from publicly available sources, or are based upon such estimates and projections.
1. *Includes minimum cash requirement.*
2. *Advance rates are net of 3% cushion.*

Risk Retention Under Various Structures

While Freddie Mac / regulators may require MFI to retain "skin in the game," MFI's guarantee could take several forms

	Benefits	Considerations
MFI in First Loss Position	▪ First loss position for MFI likely most desirable to Freddie Mac and U.S. Treasury ▪ Equity capital mandated by max of regulatory capital or market requirements results in lower capital requirements than "ring-fenced" capital approach described below	▪ Uncapped liability structure (i.e., catastrophe risk insurance) would be challenging for public or private equity investors ▪ In the event of a "tail" event, MFI equity likely wiped out immediately
"Ring-Fenced" Capital	▪ Eliminates uncapped liability (catastrophe risk) for first-loss structure, making MFI more attractive to potential investors ▪ Structure is likely acceptable to Freddie Mac / U.S. Treasury, as restricted capital amount would be calculated as regulatory capital requirement for the guarantee portfolio	▪ Required equity under this structure would increase substantially and would likely not be eligible as "capital" under advance rates for wholesale funding ▪ Equity intensity of ring-fenced capital structure would be a drag on returns
Retention of Vertical Slice	▪ Full alignment of incentives under vertical slice structure ▪ Less stringent capital requirements for holding AAA piece as opposed to entirely sub holdings ▪ Likely to be more common approach	▪ May not be sufficient for Freddie Mac / U.S. Treasury, as losses borne by MFI would not absorb any losses for parent / government guarantee
Retention of Subordinated Securities	▪ Alignment of interest / "skin in the game" ▪ Not subject to equity risk associated with the "cat risk" scenario; losses limited to subordinated securities holdings ▪ Likely would enhance returns, as holding subs could be profitable and potentially require less capital than any outright guarantee structure	▪ May not be sufficient for Freddie Mac / U.S. Treasury, as losses borne by MFI would not absorb any losses for parent / government guarantee

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Freddie Mac

Financial Model

Consolidated Financial Statements: Guarantee & No G Scenarios

Guarantee Scenario

Assumptions

- Model assumptions are based off of Freddie Mac-provided preliminary financial model
  - ▸ Barclays has diligenced and understands the underlying grounds of these assumptions

- IO purchase volumes based on original Freddie Mac-provided financial model as regulatory capital requirements for credit enhanced IOs are believed to be much lower than expected in the revised August Freddie Mac forecast

- Effective January 1, 2013, HFS will begin with a "seed" portfolio of $7.9bn

- K-Series issuance is assumed to be ~100% on the HFS portfolio originations

- Interest income for HFS, trading securities and unsecuritized HFI based on floating rate (spread over the corresponding interest expense) to reconcile for any asset-liability mismatch

- Legacy portfolio management fee of 25 bps on unsecuritized HFI and 2 bps on AFS securities

- Barclays has applied estimates of market funding costs and advance rates to finance MFI's assets

($ in millions)	12/31/13	12/31/14	12/31/15	12/31/16	12/31/23
Origination Volumes					
HFS, at Fair Value	$22,934	$23,566	$24,217	$24,888	$28,859
Unsecuritized HFI	617	634	651	669	776
Consolidated Unsub K-Series	-	-	-	-	-
CE Bonds	493	507	521	535	621
TEBS	123	127	130	134	155
Total Origination Volumes	**$24,167**	**$24,833**	**$25,519**	**$26,226**	**$30,411**
% Growth	-	*3%*	*3%*	*3%*	*0%*
IO FV Purchase ($ per K-Deal)	$15	$15	$15	$15	$15
IO Notional Purchase ($ per K-Deal)	281	300	300	300	300
Trading Securities	6,294	6,650	7,000	7,000	8,400
Consolidated Unsub K-Series	-	-	-	-	-
Loans Sold					
K-Series / CMBS	$23,530	$24,124	$24,728	$25,381	$28,859
Gains / (Losses) (%)					
Trading Securities	1.0%	1.0%	1.0%	1.0%	1.0%
Sale of Loans via K-Series / CMBS	2.0%	2.0%	2.0%	2.0%	2.0%
Mortgage Loans at Fair Value	(1.0%)	(1.0%)	(1.0%)	(1.0%)	(1.0%)
Interest Income (Spread Over Cost)					
HFS	1.7%	1.6%	1.5%	1.4%	0.7%
Trading Securities (A-Certs / Retained CMBS)	0.1%	0.1%	0.1%	0.1%	0.1%
Unsecuritized HFI	0.7%	0.6%	0.5%	0.4%	0.3%
Interest Income (All-in %)					
Trading Securities (IO Notional)	1.5%	1.5%	1.5%	1.5%	1.5%
Consolidated Unsub K-Series	4.4%	4.5%	4.5%	4.6%	4.9%
Cost of Funds					
Warehouse (HFS)	L+ 225 bps	L+ 225 bps	L+ 225 bps	L+ 225 bps	L+ 225 bps
Repo (Trading Securities)	L+ 50 bps	L+ 50 bps	L+ 50 bps	L+ 50 bps	L+ 50 bps
HFI Conduit	L+ 400 bps	L+ 400 bps	L+ 400 bps	L+ 400 bps	L+ 400 bps
Term ABS (Unsub K-Series)	3.5%	3.7%	3.8%	3.9%	4.2%
Backup Liquidity Facility	L+ 50 bps	L+ 50 bps	L+ 50 bps	L+ 50 bps	L+ 50 bps
Advance Rates / Capital Structure					
Warehouse (HFS)	85.0%	85.0%	85.0%	85.0%	85.0%
Repo (Trading Securities)	95.0%	95.0%	95.0%	95.0%	95.0%
HFI Conduit	50.0%	50.0%	50.0%	50.0%	50.0%
Backup Liquidity Facility	95.0%	95.0%	95.0%	95.0%	95.0%
Equity Cushion on Advance Rates	3.0%	3.0%	3.0%	3.0%	3.0%
Debt / Equity	2.4x	2.0x	1.7x	1.5x	1.3x
Equity / Assets	28.2%	31.8%	34.7%	37.4%	41.3%

Note: Any estimates and projections have been prepared by or in consultation with Freddie Mac management, were obtained from publicly available sources, or are based upon such estimates and projections.

Guarantee Scenario (cont.)

Commentary

1 Ring-fencing capital for the guarantee business has contributed a large cash and equity balance

2 Trading securities and HFS portfolio decrease over time as origination volume declines. Fully ramped, MFI supports a $1.2bn portfolio of trading securities

3 We have assumed third-party capital only; contemplated funding structure primarily consists of repo, warehouse and ABS

‣ Wholesale-dependant funding structure may have implications for valuation

Balance Sheet

($ millions)	Day 1 1/1/13	Year 1 12/31/13	Year 2 12/31/14	Year 3 12/31/15	Year 4 12/31/16	Year 11 12/31/23
1 Cash and Cash Equivalents	$777	$885	$995	$1,113	$1,225	$1,619
Restricted Investment in Regulatory Capital	510	648	846	1,052	1,249	1,482
2 Trading Securities, at Fair Value	1,238	1,581	1,453	1,551	1,576	1,910
Mortgage Loans						
Unsecuritized HFI	-	$568	$1,145	$1,681	$2,140	$3,994
Consolidated Unsub K-Series	-	-	-	-	-	-
Less: Reserve for Losses on HFI	-	-	(1)	(3)	(6)	(30)
2 HFS, at Fair Value	7,858	7,225	6,631	6,087	5,563	5,372
Mortgage Loans, Net of Reserve	$7,858	$7,793	$7,774	$7,765	$7,697	$9,335
Guarantee Asset, at Fair Value	441	527	628	708	765	762
Other Assets	96	83	78	75	72	88
Total Assets	$10,919	$11,517	$11,775	$12,265	$12,584	$15,195
Repo (Trading Securities)	$1,139	$1,455	$1,337	$1,427	$1,450	$1,757
HFI Conduit	-	267	538	790	1,006	1,877
Warehouse (HFS)	6,443	5,924	5,437	4,991	4,562	4,405
Term ABS (Unsub K-Series)	-	-	-	-	-	-
Backup Liquidity Facility	-	-	-	-	-	-
3 Total Debt	$7,582	$7,646	$7,312	$7,209	$7,017	$8,039
Other Liabilities	537	621	722	804	866	879
Total Liabilities	$8,119	$8,267	$8,034	$8,013	$7,883	$8,918
Stockholders' Equity	$2,800	$3,250	$3,741	$4,252	$4,701	$6,278
Total Liabilities and Stockholders' Equity	**$10,919**	**$11,517**	**$11,775**	**$12,265**	**$12,584**	**$15,195**

Key Ratios						
Secured Debt / Assets		69.4%	66.4%	62.1%	58.8%	55.8%	52.9%
Debt / Equity		2.7x	2.4x	2.0x	1.7x	1.5x	1.3x
Equity / Assets		25.6%	28.2%	31.8%	34.7%	37.4%	41.3%

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Guarantee Scenario (cont.)

Commentary

① HFS income is the largest contributor to Interest Income, but HFS income remains relatively flat over time. For simplicity and to be conservative, there has not been an assumption made on cash interest income

② Interest expense line includes an undrawn fee for the backup liquidity facility of 0.25%

③ Guarantee fees of 25 bps provide steady income stream

④ Portfolio management fees gradually decline as Freddie legacy portfolio runs off; however, there will be value in this stream of cash flows

⑤ Gain on Sale margin relatively flat over time, and income declines gradually over time as origination volumes taper

⑥ Assumes dividends are distributed from cash generated in excess of the required capital amount

Income Statement

($ millions)	12/31/13	12/31/14	12/31/15	12/31/16	12/31/23
① Interest Income	$451	$493	$542	$600	$907
② Interest Expense	(192)	(204)	(230)	(271)	(472)
Net Interest Income	$259	$289	$311	$329	$435
% Interest Income	*57%*	*59%*	*57%*	*55%*	*48%*
% Growth		*112%*	*108%*	*106%*	*101%*
Provisions / (Benefit) for Losses	($4)	($5)	($6)	($9)	($33)
Net Interest Income After Provisions	$255	$284	$305	$321	$402
③ Guarantee Fees	$85	$111	$140	$167	$254
④ Portfolio Management Fees	158	126	93	76	64
Gains / (Losses) on Trading Securities	14	15	15	16	19
⑤ Gains / (Losses) on Sale of Mortgage Loans	471	482	495	508	577
Gains / (Losses) on Mortgage Loans at FV	(75)	(69)	(64)	(58)	(54)
Other Non-Interest Income	36	31	30	31	32
Total Non-Interest Income	$688	$696	$709	$739	$892
Total Revenue	**$943**	**$981**	**$1,014**	**$1,060**	**$1,294**
Total Non-Interest Expense	($250)	($227)	($214)	($209)	($276)
Pre-tax Net Income	$693	$754	$800	$851	$1,019
Income Tax / (Benefit)	(242)	(264)	(280)	(298)	(357)
Net Income	**$450**	**$490**	**$520**	**$553**	**$662**
% Margin	*48%*	*50%*	*51%*	*52%*	*51%*
% Growth	*--*	*9%*	*6%*	*6%*	*0%*
⑥ Dividends	-	-	$9	$104	$479
ROAA	*4.0%*	*4.2%*	*4.3%*	*4.5%*	*4.4%*
ROAE	*14.9%*	*14.0%*	*13.0%*	*12.4%*	*10.7%*
Dividend Yield @1.0x Book Value	*0.0%*	*0.0%*	*0.2%*	*2.2%*	*7.6%*

Note: Any estimates and projections have been prepared by or in consultation with Freddie Mac management, were obtained from publicly available sources, or are based upon such estimates and projections.

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Guarantee Scenario (cont.)

Guarantee Portfolio											
($ millions)	12/31/13	12/31/14	12/31/15	12/31/16	12/31/17	12/31/18	12/31/19	12/31/20	12/31/21	12/31/22	12/31/23
CE Bonds	$8,046	$6,759	$5,745	$4,826	$4,054	$3,365	$2,793	$2,290	$1,878	$1,540	$1,263
TEBS	2,671	2,244	1,907	1,602	1,346	1,117	927	760	623	511	419
K-Deals	34,949	34,250	33,223	32,226	29,003	20,302	14,821	5,187	-	-	-
Total Legacy	**$45,666**	**$43,253**	**$40,875**	**$38,654**	**$34,403**	**$24,784**	**$18,540**	**$8,237**	**$2,501**	**$2,051**	**$1,682**
CE Bonds	$490	$987	$1,478	$1,954	$2,352	$2,687	$3,003	$3,300	$3,578	$3,841	$4,077
TEBS	123	248	370	489	589	672	751	825	895	961	1,020
K-Deals	20,180	40,524	60,574	77,556	91,953	104,656	115,484	124,327	131,253	137,697	143,239
Total MFI	**$20,794**	**$41,758**	**$62,423**	**$80,000**	**$94,894**	**$108,015**	**$119,239**	**$128,452**	**$135,726**	**$142,499**	**$148,336**
Total Guarantee Portfolio	**$66,460**	**$85,011**	**$103,297**	**$118,654**	**$129,296**	**$132,799**	**$137,780**	**$136,689**	**$138,228**	**$144,549**	**$150,017**
Guarantee Fee (bps)											
CE Bonds - Legacy	69 bps	69 bps	69 bps	69 bps	69 bps	69 bps	69 bps	69 bps	69 bps	69 bps	69 bps
TEBS - Legacy	52 bps	52 bps	52 bps	52 bps	52 bps	52 bps	52 bps	52 bps	52 bps	52 bps	52 bps
K-Deals - Legacy	**17 bps**	**17 bps**	**17 bps**	**17 bps**	**17 bps**	**17 bps**	**17 bps**	**17 bps**	**17 bps**	**17 bps**	**17 bps**
CE Bonds - MFI	106 bps	106 bps	106 bps	106 bps	106 bps	106 bps	106 bps	106 bps	106 bps	106 bps	106 bps
TEBS - MFI	97 bps	97 bps	97 bps	97 bps	97 bps	97 bps	97 bps	97 bps	97 bps	97 bps	97 bps
K-Deals - MFI	**25 bps**	**25 bps**	**25 bps**	**25 bps**	**25 bps**	**25 bps**	**25 bps**	**25 bps**	**25 bps**	**25 bps**	**25 bps**
Guarantee Payment to FRE (bps)											
Consolidated Unsub K-Series	30 bps	30 bps	30 bps	30 bps	30 bps	30 bps	30 bps	30 bps	30 bps	30 bps	30 bps
CE Bonds	30 bps	30 bps	30 bps	30 bps	30 bps	30 bps	30 bps	30 bps	30 bps	30 bps	30 bps
TEBS	30 bps	30 bps	30 bps	30 bps	30 bps	30 bps	30 bps	30 bps	30 bps	30 bps	30 bps
K-Deals	10 bps	10 bps	10 bps	10 bps	10 bps	10 bps	10 bps	10 bps	10 bps	10 bps	10 bps
Return on Equity											
Net Income	$47	$65	$83	$101	$115	$125	$134	$140	$145	$151	$157
Required Capital	1,329	1,700	2,066	2,373	2,586	2,656	2,756	2,734	2,765	2,891	3,000
ROE	3.6%	3.8%	4.0%	4.3%	4.5%	4.7%	4.9%	5.1%	5.2%	5.2%	5.2%

Note: Any estimates and projections have been prepared by or in consultation with Freddie Mac management, were obtained from publicly available sources, or are based upon such estimates and projections.

No G Scenario

Assumptions

- Effective January 1, 2013, HFS will begin with a "seed" portfolio of $1.5bn

- In the No G scenario, assumptions for volumes are driven off Freddie Mac's multifamily volume projections
  - ‣ Per discussions with Freddie Mac, the proportional volumes for CE Bonds and TEBS from Freddie Mac's original preliminary multifamily projections have been reallocated to the HFS portfolio, as CE Bonds and TEBS would cease to exist in a no guarantee scenario
  - ‣ Also per discussions with Freddie Mac, we have assumed Trading Securities volume remains proportionate to the preliminary multifamily projections, however A-Certificates and IO securities are replaced by an unspecified retained CMBS piece

- IO / retained CMBS purchase volumes based on original Freddie Mac-provided financial model as regulatory capital requirements are believed to be much lower than expected in the revised August Freddie Mac forecast

- Interest income rates and cost of funds are assumed to remain the same as in the Guarantee scenario
  - ‣ Interest income for HFS, trading securities and unsecuritized HFI based on floating rate (spread over the corresponding interest expense) to reconcile for any asset-liability mismatch

- Legacy portfolio management fee of 25 bps on unsecuritized HFI and 2 bps on AFS securities

- Market-determined advance rates are expected to fall in the No G scenario

Note: Any estimates and projections have been prepared by or in consultation with Freddie Mac management, were obtained from publicly available sources, or are based upon such estimates and projections.

($ in millions)	12/31/13	12/31/14	12/31/15	12/31/16	12/31/23
Origination Volumes					
HFS, at Fair Value	$5,888	$5,991	$6,095	$6,202	$6,882
Unsecuritized HFI	-	-	-	-	-
Consolidated Unsub K-Series	-	-	-	-	-
CE Bonds	-	-	-	-	-
TEBS	-	-	-	-	-
Total Origination Volumes	**$5,888**	**$5,991**	**$6,095**	**$6,202**	**$6,882**
% Growth	-	2%	2%	2%	0%
IO FV Purchase ($ per K-Deal)	$15	$15	$15	$15	$15
IO Notional Purchase ($ per K-Deal)	281	300	300	300	300
Trading Securities	1,325	1,400	1,750	1,750	1,750
Consolidated Unsub K-Series	-	-	-	-	-
Loans Sold					
K-Series / CMBS	$6,041	$6,132	$6,224	$6,325	$6,882
Gains / (Losses) (%)					
Trading Securities	1.0%	1.0%	1.0%	1.0%	1.0%
Sale of Loans via K-Series / CMBS	3.0%	2.5%	2.0%	2.0%	2.0%
Mortgage Loans at Fair Value	(1.0%)	(1.0%)	(1.0%)	(1.0%)	(1.0%)
Interest Income (Spread Over Cost)					
HFS	1.7%	1.6%	1.5%	1.4%	0.7%
Trading Securities (A-Certs / Retained CMBS)	0.1%	0.1%	0.1%	0.1%	0.1%
Unsecuritized HFI	0.7%	0.6%	0.5%	0.4%	0.3%
Interest Income (All-in %)					
Trading Securities (IO Notional)	1.5%	1.5%	1.5%	1.5%	1.5%
Consolidated Unsub K-Series	4.4%	4.5%	4.5%	4.6%	4.9%
Cost of Funds					
Warehouse (HFS)	L+ 250 bps	L+ 250 bps	L+ 250 bps	L+ 250 bps	L+ 250 bps
Repo (Trading Securities)	L+ 50 bps	L+ 50 bps	L+ 50 bps	L+ 50 bps	L+ 50 bps
HFI Conduit	L+ 400 bps	L+ 400 bps	L+ 400 bps	L+ 400 bps	L+ 400 bps
Advance Rates / Capital Structure					
Warehouse (HFS)	75.0%	75.0%	75.0%	75.0%	75.0%
Repo (Trading Securities)	95.0%	95.0%	95.0%	95.0%	95.0%
HFI Conduit	50.0%	50.0%	50.0%	50.0%	50.0%
Backup Liquidity Facility	0.0%	0.0%	0.0%	0.0%	0.0%
Equity Cushion on Advance Rates	3.0%	3.0%	3.0%	3.0%	3.0%
Debt / Equity	2.5x	2.5x	2.6x	2.6x	2.6x
Equity / Assets	28.2%	28.6%	27.7%	27.5%	27.3%

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No G Scenario (cont.)

Commentary

1. Cash is set at a minimum of $100mm post-repayment of debt, issuance of dividends and funding of operations

2. Trading securities assumed to be retained traditional CMBS pieces similar to the A-Certificates and IO strips that Freddie Mac currently holds. Fully ramped, MFI supports a $264mm portfolio of trading securities

3. In a No G scenario, MFI would not issue any Unsubordinated K-Series or HFI

4. The reallocation of CE Bond and TEBS volumes into the HFS bucket increases the size of the HFS portfolio relative to the Guarantee; this is a reflection of "re-bucketing" and does actually reflect additional growth in originations relative to the Guarantee. Fully ramped, HFS supports a $1.5bn portfolio

Balance Sheet

($ millions)	Day 1 1/1/13	Year 1 12/31/13	Year 2 12/31/14	Year 3 12/31/15	Year 4 12/31/16	Year 11 12/31/23
Cash and Cash Equivalents	$59	$100	$100	$100	$100	$100
Trading Securities, at Fair Value	264	335	307	378	389	400
Mortgage Loans						
Unsecuritized HFI	-	-	-	-	-	-
Consolidated Unsub K-Series	-	-	-	-	-	-
Less: Reserve for Losses on HFI	-	-	-	-	-	-
HFS, at Fair Value	1,500	1,340	1,191	1,057	929	897
Mortgage Loans, Net of Reserve	$1,500	$1,340	$1,191	$1,057	$929	$897
Guarantee Asset, at Fair Value	-	-	-	-	-	-
Other Assets	6	5	5	5	5	6
Total Assets	**$1,829**	**$1,780**	**$1,603**	**$1,540**	**$1,423**	**$1,402**
Repo (Trading Securities)	$243	$308	$282	$348	$358	$368
HFI Conduit	-	-	-	-	-	-
Warehouse (HFS)	1,080	965	858	761	669	646
Term ABS (Unsub K-Series)	-	-	-	-	-	-
Backup Liquidity Facility	-	-	-	-	-	-
Total Debt	$1,323	$1,273	$1,140	$1,109	$1,027	$1,014
Other Liabilities	6	5	5	5	5	6
Total Liabilities	$1,329	$1,278	$1,145	$1,114	$1,031	$1,019
Stockholders' Equity	$500	$502	$458	$426	$391	$383
Total Liabilities and Stockholders' Equity	**$1,829**	**$1,780**	**$1,603**	**$1,540**	**$1,423**	**$1,402**

Key Ratios

Secured Debt / Assets	72.3%	71.5%	71.1%	72.0%	72.2%	72.3%
Debt / Equity	2.6x	2.5x	2.5x	2.6x	2.6x	2.6x
Equity / Assets	27.3%	28.2%	28.6%	27.7%	27.5%	27.3%

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No G Scenario (cont.)

Commentary

1 Interest income is primarily composed of interest on the HFS portfolio

2 In the No G scenario, MFI would not earn any guarantee fees

3 As in the Guarantee Scenario, portfolio management fees decline as the legacy book runs off

4 Given the reduction in origination volumes in the No G scenario, gain on sale income is significantly reduced relative to the Guarantee Scenario

5 Assumes dividends are distributed from cash generated in excess of the required capital amount

Income Statement

($ millions)	12/31/13	12/31/14	12/31/15	12/31/16	12/31/23
1 Interest Income	$89	$90	$93	$99	$115
Interest Expense	(32)	(31)	(32)	(36)	(53)
Net Interest Income	$57	$59	$61	$63	$62
% Interest Income	*65%*	*66%*	*66%*	*64%*	*54%*
% Growth		*103%*	*103%*	*103%*	*98%*
Provisions / (Benefit) for Losses	-	-	-	-	-
Net Interest Income After Provisions	$57	$59	$61	$63	$62
2 Guarantee Fees	-	-	-	-	-
3 Portfolio Management Fees	158	126	93	76	64
Gains / (Losses) on Trading Securities	3	3	3	4	4
4 Gains / (Losses) on Sale of Mortgage Loans	181	153	124	127	138
Gains / (Losses) on Mortgage Loans at FV	(14)	(13)	(11)	(10)	(9)
Other Non-Interest Income	6	6	6	6	7
Total Non-Interest Income	$335	$276	$216	$203	$203
Total Revenue	**$392**	**$335**	**$277**	**$266**	**$265**
Total Non-Interest Expense	($173)	($143)	($119)	($100)	($98)
Pre-tax Net Income	$219	$192	$159	$166	$167
Income Tax / (Benefit)	(77)	(67)	(55)	(58)	(58)
Net Income	**$142**	**$125**	**$103**	**$108**	**$109**
% Margin	*36%*	*37%*	*37%*	*40%*	*41%*
% Growth	*--*	*(12%)*	*(17%)*	*5%*	*(2%)*
5 Dividends	$140	$168	$135	$143	$110
ROAA	*7.9%*	*7.4%*	*6.6%*	*7.3%*	*7.7%*
ROAE	*28.4%*	*26.0%*	*23.3%*	*26.4%*	*28.3%*
Dividend Yield @1.0x Book Value	*28.0%*	*36.8%*	*31.7%*	*36.5%*	*28.7%*

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Segment Income Statements

Guarantee: HFS (including Trading Securities)

Maintaining the guarantee allows for growing K-Series issuance, booking significant gain on sale income

Commentary

1 Interest income primarily consists of HFS portfolio

- ▸ Spread of 170 bps decreasing 10 bps annually over interest expense of 3 month Libor + 225 bps

2 Trading securities consists of A-Certificates and IOs

- ▸ A-Certificates interest income calculated as spread of 10 bps over interest expense of L + 50 bps
- ▸ Notional interest income equivalent to 150 bps

3 Interest expense

- ▸ HFS warehouse: 77% advance rate (80% less 3% cushion); L + 225 bps
- ▸ Trading securities (A-Certificates and IO FV): L + 50 bps

4 2% Gain on Sale on total K-Series issuance ($24–29bn per year)

5 Required capital is calculated as the greater of market and regulatory capital

Financial Summary

($ millions)

	12/31/13	12/31/14	12/31/15	12/31/16	12/31/23
Interest Income					
1 HFS	$325	$303	$296	$300	$345
2 Trading Securities	112	146	170	189	260
Total Interest Income	$436	$450	$466	$489	$605
3 Interest Expense					
HFS	($161)	($158)	($165)	($179)	($252)
Trading Securities	(11)	(14)	(19)	(29)	(69)
Backup Liquidity Facility	(14)	(14)	(14)	(14)	(14)
Total Interest Expense	($186)	($186)	($198)	($222)	($335)
Net Interest Income	$250	$264	$268	$267	$270
Gains / (Losses) on Trading Securities	$14	$15	$15	$16	$19
4 Gains / (Losses) on Sale of Mortgage Loans	471	482	495	508	577
Gains / (Losses) on Mortgage Loans at FV	(75)	(69)	(64)	(58)	(54)
Total Gains / (Losses)	$409	$428	$446	$465	$542
Application Fees	$24	$25	$25	$26	$30
G&A Expenses	(75)	(94)	(111)	(127)	(206)
Pre-tax Net Income	$609	$623	$628	$631	$636
Income Tax / (Benefit)	(213)	(218)	(220)	(221)	(223)
Net Income	$396	$405	$408	$410	$413
Net Interest Margin - HFS	*2.0%*	*1.9%*	*1.9%*	*1.8%*	*1.5%*
Net Interest Margin - Trading Securities	*1.2%*	*1.3%*	*1.3%*	*1.3%*	*1.2%*
5 **Required Capital**	**$1,427**	**$1,310**	**$1,220**	**$1,127**	**$1,120**
ROE	*27.7%*	*30.9%*	*33.5%*	*36.4%*	*36.9%*

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Guarantee: Guarantee Portfolio

Guarantee business yielded low returns based on 16 bps guarantee fees so our analysis assumes a 25 bps guarantee fee per discussions with Freddie Mac

Commentary

① Guarantee Fee Income varies by security:

- ▸ CE Bonds: 106 bps
- ▸ TEBS: 97 bps
- ▸ K-Deals: 25 bps
- ▸ Legacy portfolio guarantee fees also vary – CE Bonds of 69 bps; TEBS of 52 bps and K-Deals of 17 bps

② G&A expense projections by Freddie rise from $3mm to $10mm over 10 year period

③ Required capital is calculated as the greater of market and regulatory capital

Financial Summary					
($ millions)					
	12/31/13	**12/31/14**	**12/31/15**	**12/31/16**	**12/31/23**
① Guarantee Fees					
CE Bonds	$38	$34	$34	$34	$36
TEBS	7	7	7	7	8
K-Deals	40	70	99	127	211
Total Guarantee Fees	$85	$111	$140	$167	$254
Provisions / (Benefit) for Losses	(4)	(3)	(4)	(3)	(2)
GO Accretion					
CE Bonds	$59	$39	$38	$41	$40
TEBS	7	5	5	6	8
K-Deals	26	55	87	119	247
Total GO Accretion	$92	$100	$131	$166	$295
GA MTM / Amortization					
CE Bonds	($47)	($33)	($33)	($36)	($39)
TEBS	(8)	(5)	(6)	(6)	(8)
K-Deals	(26)	(56)	(88)	(120)	(247)
Total GA MTM / Amortization	($81)	($94)	($126)	($162)	($294)
② G&A Expenses	(3)	(4)	(5)	(6)	(10)
Other Expenses (CE Asset Amortization)	(16)	(9)	(7)	(6)	(2)
Pre-tax Net Income	$73	$101	$128	$155	$242
Income Tax / (Benefit)	(26)	(35)	(45)	(54)	(85)
Net Income	$47	$65	$83	$101	$157
③ Required Capital	$1,329	$1,700	$2,066	$2,373	$3,000
ROE	*3.6%*	*3.8%*	*4.0%*	*4.3%*	*5.2%*

Guarantee: HFI & Consolidated Unsub K-Series

HFI and Consolidated Unsubordinated K-Series do not have acceptable return profiles, however HFI is included given its necessary affordable component

Commentary

1 Interest income based on spread of 65 bps decreasing 10 bps annually until normalized state of 25 bps over interest expense of L + 400 bps

2 Interest expense assumes financing can be obtained at L + 400 bps

- ▸ Only 50% advance rate driving significant capital needs
- ▸ Acts as somewhat of a tax in order to have the guarantee

Financial Summary – HFI

($ in millions)	12/31/13	12/31/14	12/31/15	12/31/16	12/31/23
1 Interest Income	$14	$43	$76	$112	$302
2 Interest Expense	(6)	(18)	(33)	(49)	(137)
Net Interest Income	$8	$25	$43	$62	$165
Provisions / (Benefit) for Losses	-	(1)	(2)	(5)	(31)
Net Interest Income After Provisions	$8	$24	$41	$57	$134
Application Fees	1	1	1	1	1
G&A Expenses	(3)	(3)	(4)	(5)	(8)
REO Expense	-	-	-	-	(0)
Pre-tax Net Income	$6	$21	$37	$53	$126
Income Tax / (Benefit)	(2)	(7)	(13)	(19)	(44)
Net Income	$4	$14	$24	$34	$82
Net Interest Margin	*3.0%*	*2.9%*	*3.1%*	*3.3%*	*4.2%*
Required Capital	$301	$607	$891	$1,134	$2,117
ROE	*1.4%*	*2.3%*	*2.7%*	*3.0%*	*3.9%*

Commentary

1 Interest income based on interest rate of 4.43% in 2012 increasing 5 bps each year

2 Interest expense assumes financing can be obtained at 3.5% initially, increasing to 4.2% in 2023

Financial Summary – Consolidated Unsub K-Series

($ in millions)	12/31/13	12/31/14	12/31/15	12/31/16	12/31/23
1 Interest Income	$10	$31	$52	$72	$159
2 Interest Expense	(9)	(28)	(47)	(65)	(146)
Net Interest Income	$2	$3	$5	$7	$14
Provisions / (Benefit) for Losses	(1)	(1)	(1)	(1)	(0)
G&A Expenses	(2)	(3)	(3)	(4)	(7)
Pre-tax Net Income	($2)	($1)	$1	$2	$7
Income Tax / (Benefit)	1	0	(0)	(1)	(2)
Net Income	($1)	($0)	$1	$1	$4
Net Interest Margin	*0.6%*	*0.5%*	*0.4%*	*0.4%*	*0.4%*
Required Capital	$49	$99	$148	$190	$352
ROE	*(2.3%)*	*(0.4%)*	*0.3%*	*0.8%*	*1.2%*

Note: Any estimates and projections have been prepared by or in consultation with Freddie Mac management, were obtained from publicly available sources, or are based upon such estimates and projections.

Guarantee: Legacy Portfolio Asset Management

Asset management of the legacy portfolio retained by Freddie provides an attractive fee-based business

Commentary

1 Legacy portfolio management fee on unsecuritized HFI of 25 bps

▸ Portfolio size of $54bn in 2013, ramping down to a steady state beginning in 2017 with an ending balance of $25bn in 2023

2 Legacy portfolio management fee on AFS securities of 2 bps

▸ Portfolio size of $45bn in 2013, running off in its entirety at the end of 2017

3 G&A expense based on Freddie Mac-provided projections

▸ Due to steady state assumption for the unsecuritized HFI legacy portfolio, assumed G&A expense for the segment remains constant from 2017 onward

Financial Summary

($ millions)

	12/31/13	12/31/14	12/31/15	12/31/16	12/31/23
Portfolio Management Fees					
1 Legacy Unsecuritized HFI	$149	$118	$87	$73	$64
2 Legacy Available for Sale	10	8	6	3	-
Portfolio Management Fees	$158	$126	$93	$76	$64
3 G&A Expense	($154)	($117)	($87)	($65)	($48)
Pre-tax Net Income	$5	$9	$6	$11	$15
Income Tax / (Benefit)	(2)	(3)	(2)	(4)	(5)
Net Income	$3	$6	$4	$7	$10

Note: Any estimates and projections have been prepared by or in consultation with Freddie Mac management, were obtained from publicly available sources, or are based upon such estimates and projections.

No G: HFS (including Trading Securities)

Volumes suffer under the No G scenario, reducing gain on sale income. However, a significantly smaller balance sheet requires less capital

Commentary	Financial Summary

Commentary

1 Interest income primarily consists of HFS portfolio

- Spread of 170 bps decreasing 10 bps annually over interest expense of 3 month Libor + 250 bps

2 Trading securities consists of A-Certificates and IOs

- Retained CMBS interest income calculated as spread of 10 bps over interest expense of L + 50 bps
- Notional interest income equivalent to 150 bps

3 Interest expense

- HFS warehouse: 72% advance rate (75% less 3% cushion); L + 250 bps
- Trading securities (A-Certificates and IO FV): L + 50 bps

4 3% Gain on Sale on CMBS issuance initially, stepping back down to 2%

- Issuance of approximately $6 – 7bn per year

5 Required capital is calculated as the greater of market and regulatory capital

Financial Summary

($ millions)

	12/31/13	12/31/14	12/31/15	12/31/16	12/31/23
Interest Income					
1 HFS	$65	$59	$55	$54	$60
2 Trading Securities	24	31	38	45	55
Total Interest Income	$89	$90	$93	$99	$115
Interest Expense					
3 HFS	($29)	($28)	($28)	($29)	($39)
Trading Securities	(2)	(3)	(4)	(7)	(15)
Backup Liquidity Facility	-	-	-	-	-
Total Interest Expense	($32)	($31)	($32)	($36)	($53)
Net Interest Income	$57	$59	$61	$63	$62
Gains / (Losses) on Trading Securities	$3	$3	$3	$4	$4
4 Gains / (Losses) on Sale of Mortgage Loans	181	153	124	127	138
Gains / (Losses) on Mortgage Loans at FV	(14)	(13)	(11)	(10)	(9)
Total Gains / (Losses)	$170	$144	$117	$120	$133
Application Fees	$6	$6	$6	$6	$7
G&A Expenses	(21)	(25)	(30)	(34)	(49)
Pre-tax Net Income	$213	$184	$154	$156	$153
Income Tax / (Benefit)	(75)	(64)	(54)	(55)	(54)
Net Income	$138	$119	$100	$101	$99
Net Interest Margin - HFS	*2.5%*	*2.4%*	*2.5%*	*2.5%*	*2.4%*
Net Interest Margin - Trading Securities	*1.2%*	*1.3%*	*1.3%*	*1.3%*	*1.2%*
5 **Required Capital**	**$402**	**$358**	**$326**	**$291**	**$283**
ROE	*34.4%*	*33.4%*	*30.7%*	*34.8%*	*35.1%*

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No G: HFI & Asset Management

Similar to the Guarantee Scenario, HFI is uneconomic and asset management provides attractive fee-based income

Commentary

① Interest income based on spread of 65 bps decreasing 10 bps annually until normalized state of 25 bps over interest expense of L + 400 bps

② Interest expense assumes financing can be obtained at L + 400 bps

▸ Only 47% advance rate driving significant capital needs

Financial Summary – HFI

($ millions)

	12/31/13	12/31/14	12/31/15	12/31/16	12/31/23
① Interest Income	$3	$9	$17	$26	$71
② Interest Expense	(1)	(4)	(7)	(11)	(32)
Net Interest Income	$2	$5	$10	$14	$38
Provisions / (Benefit) for Losses	-	(0)	(1)	(1)	(7)
Net Interest Income After Provisions	$2	$5	$9	$13	$31
Application Fees	0	0	0	0	0
G&A Expenses	(1)	(1)	(1)	(1)	(2)
REO Expense	-	-	-	-	(0)
Pre-tax Net Income	$1	$4	$8	$12	$29
Income Tax / (Benefit)	(0)	(2)	(3)	(4)	(10)
Net Income	$1	$3	$5	$8	$19
Net Interest Margin	*3.0%*	*2.9%*	*3.1%*	*3.3%*	*4.2%*
Required Capital	**$56**	**$134**	**$205**	**$265**	**$494**
ROE	*1.2%*	*2.1%*	*2.6%*	*3.0%*	*3.9%*

Commentary

① Portfolio management fee of 25 bps on $54bn HFI legacy portfolio that tapers off to $25bn by 2023

② Portfolio management fee of 2 bps on $45bn AFS legacy portfolio that runs off entirely by 2017 year end

Financial Summary – Legacy Portfolio Management

($ millions)

	12/31/13	12/31/14	12/31/15	12/31/16	12/31/23
Portfolio Management Fees					
① Legacy Unsecuritized HFI	$149	$118	$87	$73	$64
② Legacy Available for Sale	10	8	6	3	-
Portfolio Management Fees	$158	$126	$93	$76	$64
G&A Expense	($152)	($118)	($89)	($67)	($49)
Pre-tax Net Income	$6	$8	$4	$10	$14
Income Tax / (Benefit)	(2)	(3)	(2)	(3)	(5)
Net Income	$4	$5	$3	$6	$9

Note: Any estimates and projections have been prepared by or in consultation with Freddie Mac management, were obtained from publicly available sources, or are based upon such estimates and projections.

Consolidated Financial Statements: All Scenarios

Guarantee Scenario: Model Summary Output

		Guarantee Scenario										
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
($ millions)		12/31/13	12/31/14	12/31/15	12/31/16	12/31/17	12/31/18	12/31/19	12/31/20	12/31/21	12/31/22	12/31/23
Inputs	**Total Origination Volumes**	**$24,167**	**$24,833**	**$25,519**	**$26,226**	**$27,144**	**$27,958**	**$28,657**	**$29,230**	**$29,815**	**$30,411**	**$30,411**
	K-Series / CMBS Loans Sold	23,530	24,124	24,728	25,381	25,759	26,532	27,195	27,739	28,294	28,859	28,859
	Gain on Sale of Loans via K-Series / CMBS	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Summary Balance Sheet	Mortgage Loans, Net of Reserve	$7,793	$7,774	$7,765	$7,697	$8,084	$8,386	$8,647	$8,867	$9,058	$9,220	$9,335
	Guarantee Asset, at Fair Value	527	628	708	765	797	792	779	755	746	756	762
	Total Assets	$11,517	$11,775	$12,265	$12,584	$13,294	$13,739	$14,104	$14,352	$14,580	$14,951	$15,195
	Repo (Trading Securities)	$1,455	$1,337	$1,427	$1,450	$1,521	$1,593	$1,606	$1,672	$1,683	$1,748	$1,757
	Warehouse (HFS)	5,924	5,437	4,991	4,562	4,539	4,516	4,494	4,471	4,449	4,427	4,405
	HFI Conduit	267	538	790	1,006	1,203	1,359	1,497	1,617	1,720	1,810	1,877
	Term ABS (Unsub K-Series)	-	-	-	-	-	-	-	-	-	-	-
	Total Debt	$7,646	$7,312	$7,209	$7,017	$7,262	$7,469	$7,597	$7,761	$7,852	$7,984	$8,039
	Total Liabilities	$8,267	$8,034	$8,013	$7,883	$8,164	$8,369	$8,488	$8,628	$8,713	$8,856	$8,918
	Stockholders' Equity	$3,250	$3,741	$4,252	$4,701	$5,130	$5,371	$5,616	$5,724	$5,866	$6,095	$6,278
	Equity / Assets	*28.2%*	*31.8%*	*34.7%*	*37.4%*	*38.6%*	*39.1%*	*39.8%*	*39.9%*	*40.2%*	*40.8%*	*41.3%*
	Debt / Equity	***2.4x***	***2.0x***	***1.7x***	***1.5x***	***1.4x***	***1.4x***	***1.4x***	***1.4x***	***1.3x***	***1.3x***	***1.3x***
Summary Income Statement	Net Interest Income	$259	$289	$311	$329	$347	$371	$389	$404	$418	$429	$435
	Guarantee Fees	85	111	140	167	189	205	218	228	235	244	254
	Portfolio Management Fees	158	126	93	76	73	71	69	68	66	65	64
	Gains on Sale of Mortgage Loans	471	482	495	508	515	531	544	555	566	577	577
	Other Non-Interest Income	36	31	30	31	30	28	30	28	30	33	32
	Net Income	**$450**	**$490**	**$520**	**$553**	**$583**	**$607**	**$626**	**$637**	**$652**	**$661**	**$662**
	Growth	*-*	*8.9%*	*6.1%*	*6.3%*	*5.3%*	*4.3%*	*3.1%*	*1.8%*	*2.3%*	*1.4%*	*0.2%*
	ROAA	*4.0%*	*4.2%*	*4.3%*	*4.5%*	*4.5%*	*4.5%*	*4.5%*	*4.5%*	*4.5%*	*4.5%*	*4.4%*
	ROAE	***14.9%***	***14.0%***	***13.0%***	***12.4%***	***11.9%***	***11.6%***	***11.4%***	***11.2%***	***11.3%***	***11.1%***	***10.7%***

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No G Scenario: Model Summary Output

No G Scenario											
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
($ millions)	12/31/13	12/31/14	12/31/15	12/31/16	12/31/17	12/31/18	12/31/19	12/31/20	12/31/21	12/31/22	12/31/23
Inputs											
Total Origination Volumes	**$5,888**	**$5,991**	**$6,095**	**$6,202**	**$6,311**	**$6,421**	**$6,533**	**$6,648**	**$6,764**	**$6,882**	**$6,882**
K-Series / CMBS Loans Sold	6,041	6,132	6,224	6,325	6,311	6,421	6,533	6,648	6,764	6,882	6,882
Gain on Sale of Loans via K-Series / CMBS	3.0%	2.5%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Summary Balance Sheet											
Mortgage Loans, Net of Reserve	$1,340	$1,191	$1,057	$929	$924	$920	$915	$910	$906	$901	$897
Guarantee Asset, at Fair Value	-	-	-	-	-	-	-	-	-	-	-
Total Assets	$1,780	$1,603	$1,540	$1,423	$1,424	$1,422	$1,419	$1,415	$1,411	$1,407	$1,402
Repo (Trading Securities)	$308	$282	$348	$358	$363	$366	$367	$367	$368	$368	$368
Warehouse (HFS)	965	858	761	669	665	662	659	655	652	649	646
HFI Conduit	-	-	-	-	-	-	-	-	-	-	-
Term ABS (Unsub K-Series)	-	-	-	-	-	-	-	-	-	-	-
Total Debt	$1,273	$1,140	$1,109	$1,027	$1,028	$1,028	$1,025	$1,023	$1,020	$1,017	$1,014
Total Liabilities	$1,278	$1,145	$1,114	$1,031	$1,033	$1,033	$1,031	$1,028	$1,025	$1,022	$1,019
Stockholders' Equity	$502	$458	$426	$391	$390	$389	$388	$387	$386	$384	$383
Equity / Assets	*28.2%*	*28.6%*	*27.7%*	*27.5%*	*27.4%*	*27.4%*	*27.3%*	*27.3%*	*27.3%*	*27.3%*	*27.3%*
Debt / Equity	***2.5x***	***2.5x***	***2.6x***	***2.6x***	***2.6x***	***2.6x***	***2.6x***	***2.6x***	***2.6x***	***2.6x***	***2.6x***
Summary Income Statement											
Net Interest Income	$57	$59	$61	$63	$64	$64	$64	$64	$63	$63	$62
Guarantee Fees	-	-	-	-	-	-	-	-	-	-	-
Portfolio Management Fees	158	126	93	76	73	71	69	68	66	65	64
Gains on Sale of Mortgage Loans	181	153	124	127	126	128	131	133	135	138	138
Other Non-Interest Income	6	6	6	6	7	7	7	7	7	7	7
Net Income	**$142**	**$125**	**$103**	**$108**	**$115**	**$114**	**$114**	**$113**	**$112**	**$111**	**$109**
Growth	*-*	*(12.5%)*	*(17.3%)*	*4.6%*	*6.8%*	*(0.7%)*	*(0.4%)*	*(0.9%)*	*(0.7%)*	*(0.7%)*	*(2.3%)*
ROAA	*7.9%*	*7.4%*	*6.6%*	*7.3%*	*8.1%*	*8.0%*	*8.0%*	*8.0%*	*7.9%*	*7.9%*	*7.7%*
ROAE	***28.4%***	***26.0%***	***23.3%***	***26.4%***	***29.5%***	***29.3%***	***29.3%***	***29.1%***	***29.0%***	***28.9%***	***28.3%***

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G on Affordable: Model Summary Output

Consolidated Financial Statements: All Scenarios

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
	G on Affordable											
	($ millions)	12/31/13	12/31/14	12/31/15	12/31/16	12/31/17	12/31/18	12/31/19	12/31/20	12/31/21	12/31/22	12/31/23
Inputs	**Total Origination Volumes**	**$9,667**	**$9,933**	**$10,208**	**$10,490**	**$10,857**	**$11,183**	**$11,463**	**$11,692**	**$11,926**	**$12,164**	**$12,164**
	K-Series / CMBS Loans Sold	9,412	9,650	9,891	10,152	10,304	10,613	10,878	11,096	11,317	11,544	11,544
	Gain on Sale of Loans via K-Series / CMBS	3.0%	2.5%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Summary Balance Sheet	Mortgage Loans, Net of Reserve	$2,946	$2,942	$2,942	$2,918	$3,076	$3,200	$3,308	$3,398	$3,477	$3,544	$3,592
	Guarantee Asset, at Fair Value	431	450	459	459	446	408	378	343	326	326	325
	Total Assets	$5,203	$5,285	$5,484	$5,566	$5,749	$5,749	$5,856	$5,787	$5,796	$5,909	$5,997
	Repo (Trading Securities)	$536	$493	$564	$576	$583	$586	$647	$655	$659	$660	$661
	Warehouse (HFS)	2,253	2,059	1,881	1,710	1,701	1,693	1,684	1,676	1,667	1,659	1,651
	HFI Conduit	93	203	305	393	473	537	593	642	684	720	748
	Term ABS (Unsub K-Series)	-	-	-	-	-	-	-	-	-	-	-
	Total Debt	$2,882	$2,754	$2,750	$2,679	$2,756	$2,815	$2,924	$2,972	$3,010	$3,040	$3,060
	Total Liabilities	$3,384	$3,270	$3,272	$3,198	$3,260	$3,280	$3,356	$3,368	$3,388	$3,416	$3,434
	Stockholders' Equity	$1,819	$2,014	$2,212	$2,368	$2,489	$2,469	$2,499	$2,419	$2,408	$2,493	$2,562
	Equity / Assets	*35.0%*	*38.1%*	*40.3%*	*42.5%*	*43.3%*	*43.0%*	*42.7%*	*41.8%*	*41.5%*	*42.2%*	*42.7%*
	Debt / Equity	***1.6x***	***1.4x***	***1.2x***	***1.1x***	***1.1x***	***1.1x***	***1.2x***	***1.2x***	***1.2x***	***1.2x***	***1.2x***
Summary Income Statement	Net Interest Income	$89	$99	$109	$118	$126	$133	$141	$149	$154	$158	$159
	Guarantee Fees	75	79	87	95	101	103	103	102	101	102	105
	Portfolio Management Fees	158	126	92	63	41	25	14	7	4	2	1
	Gains on Sale of Mortgage Loans	282	241	198	203	206	212	218	222	226	231	231
	Other Non-Interest Income	21	16	15	15	13	11	12	10	12	14	14
	Net Income	**$260**	**$243**	**$220**	**$226**	**$229**	**$236**	**$242**	**$247**	**$252**	**$255**	**$256**
	Growth	*-*	*(6.6%)*	*(9.7%)*	*2.9%*	*1.2%*	*3.3%*	*2.3%*	*2.1%*	*2.1%*	*1.3%*	*0.2%*
	ROAA	*5.1%*	*4.6%*	*4.1%*	*4.1%*	*4.0%*	*4.1%*	*4.2%*	*4.2%*	*4.3%*	*4.4%*	*4.3%*
	ROAE	***15.2%***	***12.7%***	***10.4%***	***9.9%***	***9.4%***	***9.5%***	***9.7%***	***10.0%***	***10.4%***	***10.4%***	***10.1%***

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G Phase Out: Model Summary Output

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
	($ millions)	12/31/13	12/31/14	12/31/15	12/31/16	12/31/17	12/31/18	12/31/19	12/31/20	12/31/21	12/31/22	12/31/23
Inputs	**Total Origination Volumes**	**$22,354**	**$21,096**	**$19,740**	**$18,281**	**$16,810**	**$15,137**	**$13,290**	**$11,303**	**$9,229**	**$7,063**	**$7,063**
	K-Series / CMBS Loans Sold	21,766	20,494	19,128	17,692	15,952	14,364	12,612	10,727	8,758	6,702	6,702
	Gain on Sale of Loans via K-Series / CMBS	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.3%	2.7%	3.0%
Summary Balance Sheet	Mortgage Loans, Net of Reserve	$7,791	$7,766	$7,738	$7,651	$7,830	$7,900	$7,902	$7,842	$7,732	$7,574	$7,429
	Guarantee Asset, at Fair Value	515	594	641	658	643	585	516	433	364	309	267
	Total Assets	$11,239	$11,377	$11,620	$11,672	$11,834	$11,609	$11,372	$10,860	$10,414	$9,952	$9,654
	Repo (Trading Securities)	$1,301	$1,136	$1,097	$1,041	$976	$847	$768	$633	$551	$413	$391
	Warehouse (HFS)	5,961	5,542	5,191	4,883	4,859	4,834	4,810	4,786	4,762	4,738	4,715
	HFI Conduit	245	474	663	799	899	947	963	950	911	850	795
	Term ABS (Unsub K-Series)	-	-	-	-	-	-	-	-	-	-	-
	Total Debt	$7,507	$7,152	$6,951	$6,723	$6,733	$6,628	$6,541	$6,369	$6,224	$6,002	$5,901
	Total Liabilities	$8,115	$7,838	$7,684	$7,475	$7,470	$7,305	$7,148	$6,888	$6,671	$6,388	$6,240
	Stockholders' Equity	$3,124	$3,539	$3,936	$4,197	$4,365	$4,304	$4,224	$3,973	$3,744	$3,564	$3,414
	Equity / Assets	*27.8%*	*31.1%*	*33.9%*	*36.0%*	*36.9%*	*37.1%*	*37.1%*	*36.6%*	*35.9%*	*35.8%*	*35.4%*
	Debt / Equity	***2.4x***	***2.0x***	***1.8x***	***1.6x***	***1.5x***	***1.5x***	***1.5x***	***1.6x***	***1.7x***	***1.7x***	***1.7x***
Summary Income Statement	Net Interest Income	$248	$272	$283	$288	$289	$288	$279	$266	$250	$231	$210
	Guarantee Fees	84	106	128	146	157	160	158	152	142	132	124
	Portfolio Management Fees	158	126	92	63	41	25	14	7	4	2	1
	Gains on Sale of Mortgage Loans	435	410	383	354	319	287	252	215	204	179	201
	Other Non-Interest Income	34	27	24	23	20	15	14	10	9	9	9
	Net Income	**$424**	**$436**	**$431**	**$419**	**$396**	**$374**	**$343**	**$306**	**$286**	**$253**	**$252**
	Growth	*-*	*2.8%*	*(1.0%)*	*(2.9%)*	*(5.4%)*	*(5.5%)*	*(8.4%)*	*(10.8%)*	*(6.3%)*	*(11.7%)*	*(0.5%)*
	ROAA	*3.9%*	*3.9%*	*3.8%*	*3.6%*	*3.4%*	*3.2%*	*3.0%*	*2.8%*	*2.7%*	*2.5%*	*2.6%*
	ROAE	***14.6%***	***13.1%***	***11.5%***	***10.3%***	***9.3%***	***8.6%***	***8.0%***	***7.5%***	***7.4%***	***6.9%***	***7.2%***

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G Available to Qual Players: Model Summary Output

G Available to Qual Players

($ millions)	Year 1 12/31/13	Year 2 12/31/14	Year 3 12/31/15	Year 4 12/31/16	Year 5 12/31/17	Year 6 12/31/18	Year 7 12/31/19	Year 8 12/31/20	Year 9 12/31/21	Year 10 12/31/22	Year 11 12/31/23
Inputs											
Total Origination Volumes	**$20,542**	**$20,612**	**$20,671**	**$20,456**	**$20,358**	**$20,130**	**$19,487**	**$18,707**	**$17,889**	**$17,030**	**$17,030**
K-Series / CMBS Loans Sold	20,001	20,023	20,029	19,797	19,319	19,103	18,493	17,753	16,976	16,161	16,161
Gain on Sale of Loans via K-Series / CMBS	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.3%	2.7%	3.0%
Summary Balance Sheet											
Mortgage Loans, Net of Reserve	$7,790	$7,768	$7,750	$7,680	$7,945	$8,124	$8,248	$8,322	$8,354	$8,348	$8,328
Guarantee Asset, at Fair Value	503	580	636	669	675	645	606	554	516	493	474
Total Assets	$11,139	$11,314	$11,665	$11,864	$12,270	$12,337	$12,419	$12,247	$12,157	$12,068	$12,028
Repo (Trading Securities)	$1,224	$1,125	$1,151	$1,164	$1,171	$1,115	$1,109	$1,047	$1,039	$975	$966
Warehouse (HFS)	5,998	5,588	5,221	4,879	4,855	4,831	4,806	4,782	4,759	4,735	4,711
HFI Conduit	224	448	651	815	955	1,055	1,129	1,179	1,208	1,219	1,223
Term ABS (Unsub K-Series)	-	-	-	-	-	-	-	-	-	-	-
Total Debt	$7,445	$7,161	$7,024	$6,859	$6,981	$7,000	$7,044	$7,008	$7,005	$6,929	$6,900
Total Liabilities	$8,040	$7,833	$7,752	$7,622	$7,752	$7,742	$7,748	$7,658	$7,617	$7,514	$7,465
Stockholders' Equity	$3,099	$3,481	$3,913	$4,241	$4,518	$4,595	$4,671	$4,589	$4,540	$4,554	$4,563
Equity / Assets	*27.8%*	*30.8%*	*33.5%*	*35.8%*	*36.8%*	*37.2%*	*37.6%*	*37.5%*	*37.3%*	*37.7%*	*37.9%*
Debt / Equity	***2.4x***	***2.1x***	***1.8x***	***1.6x***	***1.5x***	***1.5x***	***1.5x***	***1.5x***	***1.5x***	***1.5x***	***1.5x***
Summary Income Statement											
Net Interest Income	$242	$267	$283	$295	$306	$315	$320	$320	$318	$314	$304
Guarantee Fees	83	103	125	146	161	169	174	176	174	173	174
Portfolio Management Fees	158	126	92	63	41	25	14	7	4	2	1
Gains on Sale of Mortgage Loans	400	400	401	396	386	382	370	355	396	432	485
Other Non-Interest Income	32	27	25	25	23	20	20	17	18	19	19
Net Income	**$399**	**$425**	**$441**	**$448**	**$448**	**$452**	**$445**	**$433**	**$457**	**$474**	**$501**
Growth	*-*	*6.7%*	*3.6%*	*1.7%*	*0.0%*	*0.9%*	*(1.6%)*	*(2.8%)*	*5.7%*	*3.6%*	*5.8%*
ROAA	*3.7%*	*3.8%*	*3.8%*	*3.8%*	*3.7%*	*3.7%*	*3.6%*	*3.5%*	*3.7%*	*3.9%*	*4.2%*
ROAE	***13.7%***	***12.9%***	***11.9%***	***11.0%***	***10.2%***	***9.9%***	***9.6%***	***9.3%***	***10.0%***	***10.4%***	***11.0%***

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BARCLAYS

Freddie Mac

Valuation

Framework and Methodologies

Valuation Approach Detail

Barclays has employed several techniques in assessing the value of MFI

Public Comparables

- Methodology indicates where similar companies (size, growth, business model) trade in the public markets on a Price to Earnings ("P / E") and P / B basis
- There are limited public comparable companies
  - Used a blend of specialty finance companies, regional banks and commercial REITs as comparables set as no category individually captures the MFI go-forward business model
  - Considered historical relative trading multiples of GSEs over time to public comparables and through various business cycles

Price / Book Value to ROTCE Regression

- Regressed P / B multiple against return on tangible common equity (ROTCE) for peer set
- Based on regression equation, we can imply the expected P / B value multiple for a company with MFI's ROTCE profile

Discounted Cash Flow ("DCF")

- Assumes capital generated in excess of required equity is paid out as dividends
- Terminal value calculated based on implied Price to Book value ("P / B") multiple based on applying regression equation on average of final three years ROAE
- Applies midpoint cost of equity of 11.0% for the Guarantee and 15.3% for the No G scenarios
  - Cost of equity range: Traditional Capital Asset Pricing Model (CAPM) formula serves as basis for lower end of the range while an Implied Cost of Equity based on volatility drivers serves as the high end of our range
  - Sensitized valuation based on a range of costs of equity and assumed exit multiples

Sum of the Parts

- Isolated business segments so as to assess their individual earnings and contribution to overall MFI business valuation
  - Applied different valuation methodologies based on segment characteristics

Other

- Calculated implied P / E and P / B multiples for a range of valuations
  - Served as a "sanity check" against valuations calculated under other methodologies
- Relevant precedent transactions are limited

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Cost of Equity

Barclays uses both the CAPM and an Implied Cost of Equity; the following highlights some of the key differences between the two approaches

Framework

Summary Observations

- CAPM primarily relies on backward-looking inputs such as historical Beta and market risk premium
    - CAPM is also often criticized as being unrealistic as it is based on the assumptions that 1) the market is efficient – all information is freely available to all investors who, as a result, have the same expectations, 2) all investors are rational and 3) investors will only require a return for systematic risk of their portfolios since unsystematic risk is not taken into consideration

- Barclays' Implied Cost of Equity methodology uses forward-looking inputs to determine investors' current perception of a company's equity risk, useful for confirming or challenging CAPM results

Beta

- The effectiveness / appropriateness of a Beta-based approach may be limited for several reasons
    - Beta is backward looking, so it may not reflect the current (or future) market
    - The correlation (strength) of a Beta's underlying regression may be weak (particularly for specialty finance names), making the observed coefficient less meaningful in a cost of equity context

- Implied Cost of Equity does not rely on Betas to inform a company's cost of equity

Market Risk Premium

- Equity market risk premium estimates often utilize historical data and may underestimate risk, particularly during periods of heightened volatility

Cost of Equity under Different Methodologies		
Scenario	CAPM	Implied COE
Guarantee	8.5%	13.5%
No G	13.9%	16.6%
G on Affordable	8.5%	13.5%
G Phase Out	11.2%	15.1%
G Available to Qual Players	8.5%	13.5%

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Additional Valuation Considerations

Business Model

- Nature of the go-forward relationship with Freddie Mac
  - Does MFI have exclusivity? Who owns the "Freddie Mac" brand and what is its value? How will it benefit MFI?
- Balance sheet intensity of the go-forward business
  - Is this a finance company or portfolio lender? Hybrid?
  - The heavier MFI's balance sheet, the more investors will scrutinize funding sources, liquidity and leverage
- Gestation period for HFS portfolio / speed of execution
  - Separation from Freddie Mac will drive urgency to turn over HFS book
  - Ratings and other processes may take longer time than required under current programmatic Freddie Mac issuance

Capital Structure / Allocation of Capital

- MFI must have a sustainable funding structure
- Asset / liability matching will be critical
- Equity required by market funding structures

Guarantee Structure

- Guarantee structure must be acceptable to both Government and investors
  - Government will require an alignment of interest between Freddie Mac and MFI in the event a guarantee structure remains in place
  - Uncapped catastrophe liability will likely be unacceptable to investors

Growth

- Investors will value growth in the earnings stream they are purchasing
- Lack of growth will be a hindrance on valuation

Legacy Portfolio

- Limited actionable alternatives for MFI to assume legacy portfolio without parent funding and credit guarantee
- Speed of run-off of legacy portfolio will impact portfolio management earnings stream
  - Investors will likely not give valuation credit for portfolio management stream associated with a run-off portfolio
  - In order for portfolio management platform to be valuable, business must be viewed as viable and growing (i.e., must manage third party portfolios)

HFI Portfolio

- We believe $4 billion of long term assets, funded with short term facilities, is not viable
- Must be sensitive not to disturb Affordable or HFS business segments with drastic changes to HFI

Competitive Landscape

- How will competitive reactions by Fannie Mae and conduit players change the profitability and viability of a standalone MFI?

Comparables Companies and Transactions

Trading Comparables Observations

We have compared MFI against three main categories of companies: non-bank specialty finance companies, commercial mortgage REITs, and regional banks

	MFI	Specialty Finance Companies	Regional Banks	Commercial Mortgage REITs
Growth	▪ Relatively low growth in originations	▪ Relatively high growth	▪ Modest growth (average 7% median long-term growth)	▪ Relatively low growth (average 5% median long-term growth)
Quality of Earnings	▪ Lower quality of earnings due to GoS business model ▪ Asset management fee stream higher quality	▪ Can be consistent earnings, although higher growth seen as contributor to more volatile losses and earnings over the cycle	▪ Consistent interest income, with periodic questions regarding credit losses	▪ Consistent earnings from spread lending
Liquidity	▪ High quality asset base with liquid AAA tranches ▪ Dependent on wholesale and repo markets	▪ Generally very focused asset mix ▪ Generally wholesale funded ▪ Some access to unsecured / bank debt markets	▪ Moderately liquid asset portfolio ▪ Strong access to diversified funding sources (deposits, FHLB. FRB)	▪ Generally illiquid whole loans and liquid securities book ▪ Somewhat dependent on repo markets, subject to leverage ▪ Access to equity markets as a source of liquidity
Dividend Yield	▪ NA	▪ Generally do not pay significant dividends	▪ Low single digit (~2%)	▪ High single digit dividend yields (7 -10%)
ROE	▪ "Guarantee" mid to high teens ▪ "No Guarantee" high 20s / 30s	▪ Broad range of returns highly dependent on business model	▪ High single digit / low teens returns	▪ High single digits
Leverage	▪ High levels of funding debt; most similar to specialty finance companies ▪ Wholesale / repo	▪ Generally operate with high levels of funding debt, and moderate to high corporate debt	▪ Diversified funding	▪ < 1.0x debt / equity ▪ Generally repo debt
Price / Earnings	▪ See following page	▪ Wide range for current year ▪ 7 -12x forward	▪ 9-12x current year ▪ 8 -11x forward	▪ 10 -14x current year ▪ 9 -12x forward
Price / Book Value	▪ See following page	▪ 1.0 - 3.0x depending on ROE	▪ 0.6 - 2.0x depending on ROE	▪ ~1.0x to slight discount

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Benchmarking MFI

We have benchmarked MFI relative to specialty finance companies and regional banks, while considering commercial REITs as well despite major structural differences

	Guarantee Scenario	No G Scenario	Other Scenarios	Medians [1]

Relative to Specialty Finance Companies	▪ We would expect MFI to trade at a premium to its peer specialty finance companies
	  ‣ Dominant market position and franchise value with guarantee still in place
	  ‣ More competitive and reliable funding structure
	  ‣ Guarantee of K-Series issuance would effectively provide MFI with unlimited liquidity
		▪ MFI would most closely resemble a wholesale funded mortgage origination business
		▪ Returns are more attractive than overall specialty finance peers
		▪ Ignoring the HFI portfolio, MFI could trade broadly in line with Walker & Dunlop
			▪ Affordable and Qualified players' capital structure / business model is more reliable, but smaller market position
			▪ Phase Out shifts to look like No G business
				P/E: 7.7x
				P/B: 1.77x

Relative to Regional Banks	▪ With guarantee in place, stability of funding would be similar to liquidity available to banks, a positive for valuation ▪ Banks typically have more predictable, stable earnings streams	▪ Without a guarantee, MFI would be at a disadvantage to regional banks from a funding perspective in terms of both cost and availability	▪ Affordable and Qualified players' stability of funding similar to Guarantee	P/E: 9.6x P/B: 0.82x
Relative to Commercial REITs	▪ Differences in leverage profile and tax structure ▪ Growth in commercial REITs tends to be higher than expected growth at MFI ▪ Earnings quality at REITs would tend to be higher, given the predictable earnings stream from asset base			P/E: 11.9x P/B: 1.04x

Trading Comparables

There are limited comparables closely resembling MFI's go-forward business

Market Data as of November 23, 2012

($ in millions, except per share)

	Market Value	Price	Stock 1 Year	Price to: 2012E EPS	2013E EPS	BV	TBV	Dividend Yield	ROATCE	ROAA	Total Debt / Equity [7]	Long-term Growth
Specialty Finance - Non-Banks												
Sallie Mae [1]	$7,880	$17.05	41.8 %	7.9 x	7.3 x	1.80 x	2.01 x	0.0 %	18.7 %	0.4 %	40.5 x	7.3 %
CIT Group	7,472	37.20	23.2	NM	10.7	0.92	0.97	0.0	NM	NM	3.5	NM
Ocwen Financial [2]	4,663	34.54	168.6	NM	7.5	3.06	3.21	0.0	14.5	4.3	1.6	40.0
Nationstar Mortgage Holdings [3]	2,493	27.58	97.0	11.7	8.5	3.61	3.61	0.0	33.3	4.1	6.3	13.0
Walter Investment Management Corp [4]	1,445	40.42	92.6	14.5	7.7	1.73	5.90	0.0	25.8	0.6	3.6	6.0
PHH Corp	1,186	20.92	43.2	NM	7.2	0.81	0.84	0.0	11.8	1.8	4.3	NA
Walker & Dunlop	577	16.68	45.7	8.8	7.6	1.70	2.11	0.0	12.5	2.2	4.0	NA
HFF, Inc.	538	14.56	44.7	14.4	12.4	3.42	3.50	0.0	26.3	7.1	1.5	15.0
Mean			*69.6 %*	*11.5 x*	*8.6 x*	*2.13 x*	*2.77 x*	*0.0 %*	*20.4 %*	*2.9 %*	*8.2 x*	*16.3 %*
Median			*45.2*	*11.7*	*7.7*	*1.77*	*2.66*	*0.0*	*18.7*	*2.2*	*3.8*	*13.0*
Regional Banks												
U.S. Bancorp	$61,253	$32.58	36.9 %	11.3 x	10.6 x	1.81 x	2.56 x	2.4 %	24.3 %	1.7 %	7.5 x	8.1 %
PNC Financial	29,492	55.75	14.1	9.9	8.5	0.84	1.17	2.9	14.8	1.2	6.0	4.9
BB&T	20,154	28.81	36.9	10.7	9.8	1.07	1.77	2.8	17.0	1.1	7.4	9.4
SunTrust	14,807	27.48	67.2	7.7	10.0	0.74	1.09	0.7	31.6	2.5	7.2	17.4
Fifth Third	13,363	14.89	36.1	9.1	9.3	1.00	1.23	2.7	12.8	1.2	7.2	4.0
Regions Financial	9,453	6.69	81.8	9.0	8.9	0.63	0.96	0.6	13.2	1.0	6.9	7.0
Key Corp.	8,079	8.45	26.7	9.5	9.5	0.79	0.89	2.4	9.7	1.0	7.0	5.0
Comerica	5,754	29.19	27.6	11.0	11.0	0.79	0.87	2.1	7.4	0.7	7.7	8.0
Mean			*40.9 %*	*9.8 x*	*9.7 x*	*0.96 x*	*1.32 x*	*2.1 %*	*16.3 %*	*1.3 %*	*7.1 x*	*8.0 %*
Median			*36.5*	*9.7*	*9.6*	*0.82*	*1.13*	*2.4*	*14.0*	*1.2*	*7.2*	*7.5*
Commercial Mortgage REITs												
Starwood Property Trust [5]	$3,056	$22.59	25.4 %	11.6 x	11.9 x	1.13 x	1.13 x	7.8 %	8.1 %	5.5 %	0.6 x	5.0 %
CreXus Investment Corp	951	12.41	26.4	13.9	12.0	1.04	1.05	10.3	9.9	9.4	0.0	15.0
Colony Financial	809	19.62	39.9	14.0	11.5	1.08	1.08	7.1	6.1	3.8	0.1	4.0
Apollo Commercial Real Estate Finance [6]	461	16.45	19.8	10.5	9.7	1.01	1.01	9.7	11.0	6.3	0.7	6.4
Ares Commercial Real Estate Corp.	149	16.03	(13.4)	NM	12.0	0.89	0.89	6.2	NM	NM	0.3	3.5
Mean			*19.6 %*	*12.5 x*	*11.4 x*	*1.03 x*	*1.03 x*	*8.2 %*	*8.8 %*	*6.3 %*	*0.4 x*	*6.8 %*
Median			*25.4*	*12.8*	*11.9*	*1.04*	*1.05*	*7.8*	*9.0*	*5.9*	*0.3*	*5.0*

Source: SNL Financial and FactSet. All financial data as of or for the quarter ended September 30, 2012.
Note: Equity values based on common equity. Market data as of November 23, 2012.
1. On October 21st, SLM Funding (subsidiary of SLM) filed a prospectus supplement for $1.25 billion aggregate principal amount of floating-rate student loan-backed notes.
2. On October 3, 2012, Ocwen agreed to acquire Homeward Residential for $1.1 billion. No adjustments have been made. On October 24, 2012, Ocwen and Walter Investment Management Corp. were awarded the highest and best bid for the mortgage servicing and origination platform assets of Residential Capital with a purchase price of $3 billion. No adjustments have been made.
3. IPO was on March 8, 2012.
4. Pro forma for offering of 6.9 million shares of common stock priced October 17, 2012, $290 million offering of convertible senior subordinated notes priced October 17, 2012, $600 million term loan announced October 25, 2012 used to pay down $444 million existing first tier term loan, and RMS acquisition closed November 1, 2012. On October 24, 2012, Ocwen and Walter Investment Management Corp. were awarded the highest and best bid for the mortgage servicing and origination platform assets of Residential Capital with a purchase price of $3 billion. No adjustments have been made.
5. Pro forma for offering of 18.4 million common shares priced on October 3, 2012.
6. Pro forma for common stock offering of 7 million shares announced October 2, 2012.
7. Debt includes deposits for regional banks, CIT and SLM Corporation.

Historical Price / NTM Earnings

With the exception of the tech bubble, historical P / E ratios have gravitated towards 10x across cycles; market participants believe these valuation multiples are likely in the near to medium term

Historical Price / NTM Earnings

P / NTM E

Legend: Freddie Mac — Fannie Mae — Countrywide — IndyMac — WaMu — Sallie Mae — S&P

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
NTM P / E Multiple																				
Median	11x	10x	8x	11x	12x	11x	8x	11x	12x	15x	15x	12x	12x	14x	9x	9x	10x	9x	10x	12x
High	15x	17x	13x	19x	16x	13x	12x	14x	15x	20x	25x	21x	18x	20x	22x	21x	22x	20x	18x	23x
Low	6x	7x	4x	6x	8x	0x	6x	8x	9x	9x	7x	6x	7x	8x	7x	6x	8x	6x	8x	8x
S&P 500	12x	13x	14x	17x	18x	18x	15x	16x	18x	20x	26x	28x	26x	25x	26x	23x	21x	18x	18x	17x

Source: SNL Financial.

Price to Book Value Regression

Using the comparable companies on page 55, Barclays benchmarked price to book values against ROTCEs

ROTCE vs. Price / Book Value Regression Analysis

Implied Price / Book Value	Multiple Range
Guarantee	1.60x - 1.70x
No G	3.10x - 3.20x
G on Affordable	1.40x - 1.70x
G Phase Out	1.50x - 1.60x
G Avail to Qual Players	1.50x - 1.60x

$y = 0.1184x - 0.0441$
$R^2 = 0.8152$
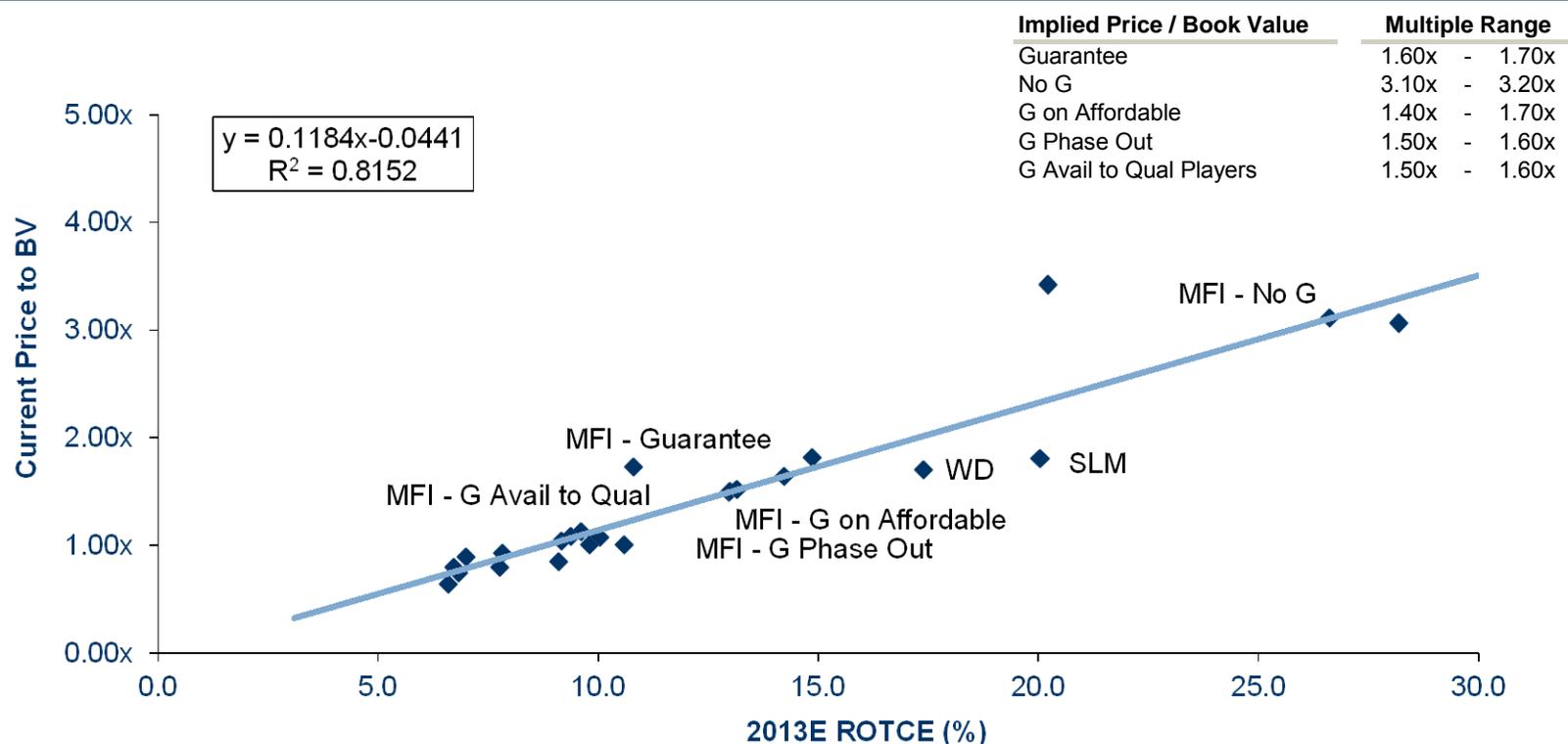
Note: Market data of November 23, 2012. MFI based on forward ROTCE. Companies include SLM, CIT, OCN, PHH, WD, HF, STWD, CXS, CLNY, ARI, ACRE, USB, PNC, BBT, STI, FITB, RF, KEY and CMA.
The regression graph is showing the low end of the range, which is informed by the regression equation methodology for the average of the first four years of ROAE for the scenario.

CRE Lender Precedent Transactions

There is a limited number of precedent transactions with relevant metrics to benchmark off of post-crisis

CRE Lender Precedent Transactions

	Announced Date	Buyer	Seller	Transaction Value ($M)	Value / Book Value	Value / Earnings	Premium / Managed Receivables
	6/7/2012	Walker & Dunlop, Inc.	CWCapital LLC	$208.5	1.4x	8.4x	1.2%
Pre-Crisis	12/31/2006	Municipal Mortgage & Equity, LLC	George Elkins Mortgage Banking Company	10.5	NA	NA	1.1%
	4/25/2006	Wachovia Corporation	American Property Financing, Inc.	109.9	NA	NA	1.2%
	8/30/2005	Private equity consortium	GMAC Commercial Holding Corp.	1,300.0	NA	NA	0.9%
	6/16/2003	Management group	Holliday Fenoglio Fowler, L.P.	8.8	0.9x	NA	0.1%
	10/26/2001	Charter Municipal Mortgage Acceptance Company	PW Funding Inc.	29.2	NA	NA	1.3%
	5/10/2000	Prudential Insurance Company of America	WMF Group Ltd.	99.4	2.5x	27.0x	0.7%
	9/30/1999	Municipal Mortgage & Equity LLC	Midland Financial Holdings Inc.	36.7	3.9x	20.9x	20.5%
	6/23/1999	Equitex, Inc.	First Bankers Mortgage Services Inc.	10.1	2.8x	24.1x	NA
	6/27/1996	CB Commercial Real Estate Group, Inc.	L.J. Melody & Co.	15.0	2.3x	12.8x	0.4%
			Median		2.4x	20.9x	1.1%

Sum of the Parts Analysis

Sum of the Parts Analysis

($ in millions)

Guarantee Scenario

HFS

Valuation Method	2013E Net Income	2013E Equity	Multiple Range Low	Multiple Range High	Valuation Low	Valuation High
Price to Earnings	$396	-	9.0x	11.0x	$3,562	$4,353
Price to Book Value	-	1,427	1.50x	2.00x	2,140	2,854
Regression Analysis [1]	-	1,427	3.45x	3.75x	4,923	5,351
				Average	$3,500	$4,200
				Excess Capital	(900)	(900)
				Total	$2,600	$3,300

Guarantee Portfolio

Valuation Method	2013E Net Income	2013E Equity	Multiple Range Low	Multiple Range High	Valuation Low	Valuation High
Price to Book Value	-	$1,329	0.60x	0.60x	$700	$700
				Average	$700	$700

HFI

Valuation Method	2013E Net Income	2013E Equity	Multiple Range Low	Multiple Range High	Valuation Low	Valuation High
Price to Earnings	$4	-	9.0x	11.0x	$38	$46
Price to Book Value	-	301	0.90x	1.00x	271	301
				Average	$150	$170

Portfolio Management

Valuation Method	Discount Rate Low	Discount Rate High	Valuation Low	Valuation High
DCF	10.0%	12.0%	$140	$140

Implied Valuation

	Low	High
Total Valuation (PV)	$4,490	$5,210
Initial Equity Required	(2,800)	(2,800)
Premium / Discount (NPV)	$1,690	$2,410

1. Price to Book ("P / B") terminal multiple informed by regression equation methodology for average of first two years ROAE for scenario at the high end of the range and average of first four years of ROAE for scenario at the low end of the range.

Sum of the Parts Analysis (cont.)

($ in millions)

No G Scenario							

HFS

Valuation Method	2013E Net Income	2013E Equity	Multiple Range		Valuation	
			Low	High	Low	High
Price to Earnings	$138	-	6.0x - 8.0x		$830 -	$1,107
Price to Book Value	-	402	1.25x - 1.50x		502 -	603
Regression Analysis [1]	-	402	3.90x - 4.00x		1,568 -	1,608
			Average [2]		$700 -	$900
			Excess Capital		100	100
			Total		$800	$1,000

Portfolio Management

Valuation Method	Discount Rate		Valuation	
	Low	High	Low	High
DCF	10.0% -	12.0%	$130 -	$140

Implied Valuation

	Low	High
Total Valuation (PV)	$930 -	$1,140
Initial Equity Required	(500)	(500)
Premium / Discount (NPV)	$430	$640

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1. Price to Book ("P / B") terminal multiple informed by regression equation methodology for average of first two years ROAE for scenario at the high end of the range and average of first four years of ROAE for scenario at the low end of the range.
2. Average excludes regression analysis due to potential for significant investor discount on high ROEs.

Preliminary Valuation

Valuation Summary: Guarantee and No G

Valuation Summary

($ in millions)	Assumptions					Valuation		
Public Comps - Price / Earnings	Multiple Range			2013 Earnings		Low		High
Guarantee	9.0x	-	11.0x	$450		$4,053	-	$4,954
No G	6.0x	-	8.0x	142		855	-	1,139
Public Comps - Price / Book Value	Multiple Range			1/1/2013 Book Value		Low		High
Guarantee	1.50x	-	2.00x	$2,800		$4,200	-	$5,600
No G	1.25x	-	1.50x	500		625	-	750
Discounted Cash Flow	Exit Multiple (BV)			Cost of Equity		Low		High
Guarantee	1.60x	-	1.70x	8.5%	- 13.5%	$3,569	-	$5,881
No G	3.10x	-	3.20x	13.9%	- 16.6%	871	-	1,014
Regression - Implied Price / Book Value	Multiple Range			1/1/2013 Book Value		Low		High
Guarantee	1.60x	-	1.70x	$2,800		$4,480	-	$4,760
No G	3.10x	-	3.20x	500		1,550	-	1,600
Sum of the Parts						Low		High
Guarantee						$4,490	-	$5,210
No G						930	-	1,140

Indicative Valuation		Low		High
Guarantee	Gross Value	$4,500	-	$6,000
	Net Value to Freddie	1,700		3,200
No G	Gross Value	$850	-	$1,000
	Net Value to Freddie	350		500

Note: Projections prepared in consultation with the management of Freddie Mac.
1. Price to Book ("P / B") terminal multiple informed by regression equation methodology for average of first two years ROAE for scenario at the high end of the range and average of first four years of ROAE for scenario at the low end of the range.

Valuation Summary: Other Scenarios

Valuation Summary							

($ in millions)

	Assumptions					Valuation	

Public Comps - Price / Earnings	Multiple Range			2013 Earnings		Low	High
G on Affordable	9.0x	-	11.0x	$260		$2,343	- $2,863
G Phase Out	9.0x	-	11.0x	424		3,816	- 4,664
G Available to Qual Players	8.0x	-	10.0x	399		3,189	- 3,986

Public Comps - Price / Book Value	Multiple Range			1/1/2013 Book Value		Low	High
G on Affordable	1.25x	-	1.50x	$1,600		$2,000	- $2,400
G Phase Out	1.25x	-	1.50x	2,700		3,375	- 4,050
G Available to Qual Players	1.25x	-	1.50x	2,700		3,375	- 4,050

Discounted Cash Flow	Exit Multiple (BV)			Cost of Equity		Low	High
G on Affordable	1.40x	-	1.70x	8.5% - 13.5%		$1,583	- $2,718
G Phase Out	1.50x	-	1.60x	11.2% - 15.1%		2,203	- 3,121
G Available to Qual Players	1.50x	-	1.60x	8.5% - 13.5%		2,831	- 4,573

Regression - Implied Price / Book Value	Multiple Range			1/1/2013 Book Value		Low	High
G on Affordable	1.40x	-	1.70x	$1,600		$2,240	- $2,720
G Phase Out	1.50x	-	1.60x	2,700		4,050	- 4,320
G Available to Qual Players	1.50x	-	1.60x	2,700		4,050	- 4,320

Indicative Valuation		Low		High
G on Affordable	Gross Value	$2,100	-	$2,700
	Net Value to Freddie	500		1,100
G Phase Out	Gross Value	$3,600	-	$4,200
	Net Value to Freddie	900		1,500
G Available to Qual Players	Gross Value	$3,300	-	$4,200
	Net Value to Freddie	600		1,500

_____
Note: Projections prepared in consultation with the management of Freddie Mac.
1. Price to Book ("P / B") terminal multiple informed by regression equation methodology for average of first two years ROAE for scenario at the high end of the range and average of first four years of ROAE for scenario at the low end of the range.

Valuation Summary (cont.)

Utilizing the valuation ranges from the previous page implies a range of price / earnings and price / book value multiples

Guarantee Scenario

($ in millions)

	Data	Valuation Range				
		$4,500	$4,875	$5,250	$5,625	$6,000
Price / 2013 Earnings	$450	10.0x	10.8x	11.7x	12.5x	13.3x
Price / 2014 Earnings	490	9.2x	9.9x	10.7x	11.5x	12.2x
Price / 2012 Book Value	2,800	1.61x	1.74x	1.88x	2.01x	2.14x
Price / 2013 Book Value	3,250	1.38x	1.50x	1.62x	1.73x	1.85x

No G Scenario

($ in millions)

	Data	Valuation Range				
		$850	$888	$925	$963	$1,000
Price / 2013 Earnings	$142	6.0x	6.2x	6.5x	6.8x	7.0x
Price / 2014 Earnings	125	6.8x	7.1x	7.4x	7.7x	8.0x
Price / 2012 Book Value	500	1.70x	1.78x	1.85x	1.93x	2.00x
Price / 2013 Book Value	502	1.69x	1.77x	1.84x	1.92x	1.99x

Note: Any estimates and projections have been prepared by or in consultation with Freddie Mac management, were obtained from publicly available sources, or are based upon such estimates and projections.

Valuation Summary (cont.)

Utilizing the valuation ranges from the previous page implies a range of price / earnings and price / book value multiples

G on Affordable						

($ in millions)	Data	Valuation Range				
		$2,100	$2,250	$2,400	$2,550	$2,700
Price / 2013 Earnings	$260	8.1x	8.6x	9.2x	9.8x	10.4x
Price / 2014 Earnings	243	8.6x	9.3x	9.9x	10.5x	11.1x
Price / 2012 Book Value	1,600	1.31x	1.41x	1.50x	1.59x	1.69x
Price / 2013 Book Value	1,819	1.15x	1.24x	1.32x	1.40x	1.48x

G Phase Out						

($ in millions)	Data	Valuation Range				
		$3,600	$3,750	$3,900	$4,050	$4,200
Price / 2013 Earnings	$424	8.5x	8.8x	9.2x	9.6x	9.9x
Price / 2014 Earnings	436	8.3x	8.6x	8.9x	9.3x	9.6x
Price / 2012 Book Value	2,700	1.33x	1.39x	1.44x	1.50x	1.56x
Price / 2013 Book Value	3,124	1.15x	1.20x	1.25x	1.30x	1.34x

G Available to Qual Players						

($ in millions)	Data	Valuation Range				
		$3,300	$3,525	$3,750	$3,975	$4,200
Price / 2013 Earnings	$399	8.3x	8.8x	9.4x	10.0x	10.5x
Price / 2014 Earnings	425	7.8x	8.3x	8.8x	9.3x	9.9x
Price / 2012 Book Value	2,700	1.22x	1.31x	1.39x	1.47x	1.56x
Price / 2013 Book Value	3,099	1.06x	1.14x	1.21x	1.28x	1.36x

Note: Any estimates and projections have been prepared by or in consultation with Freddie Mac management, were obtained from publicly available sources, or are based upon such estimates and projections.

Discounted Cash Flow

($ in millions)

Guarantee Scenario

	12/31/13	12/31/14	12/31/15	12/31/16	12/31/17	12/31/18	12/31/19	12/31/20	12/31/21	12/31/22	12/31/23
Beginning Balance Equity	$2,800	$3,250	$3,741	$4,252	$4,701	$5,130	$5,371	$5,616	$5,724	$5,866	$6,095
Net Income	450	490	520	553	583	607	626	637	652	661	662
Issuance of Equity / (Dividends)	-	-	(9)	(104)	(153)	(366)	(381)	(530)	(509)	(433)	(479)
Ending Balance Equity	$3,250	$3,741	$4,252	$4,701	$5,130	$5,371	$5,616	$5,724	$5,866	$6,095	$6,278
Cash Flows	-	-	$9	$104	$153	$366	$381	$530	$509	$433	$10,837
Discounted Cash Flows	-	-	7	69	91	196	183	230	199	152	3,439

Valuation (PV)	$4,566

Sensitivities Analysis

Valuation (Present Value)

		Exit Multiple (BV)				
		1.60x	1.63x	1.65x	1.68x	1.70x
Cost of Equity	8.5%	$5,625	$5,689	$5,753	$5,817	$5,881
	9.8%	$5,008	$5,064	$5,121	$5,177	$5,234
	11.0%	$4,466	$4,516	$4,566	$4,615	$4,665
	12.3%	$3,989	$4,033	$4,077	$4,121	$4,165
	13.5%	$3,569	$3,608	$3,647	$3,686	$3,725

Implied Entry Price to Book Value

		Exit Multiple (BV)				
		1.60x	1.63x	1.65x	1.68x	1.70x
Cost of Equity	8.5%	2.01x	2.03x	2.05x	2.08x	2.10x
	9.8%	1.79x	1.81x	1.83x	1.85x	1.87x
	11.0%	1.59x	1.61x	1.63x	1.65x	1.67x
	12.3%	1.42x	1.44x	1.46x	1.47x	1.49x
	13.5%	1.27x	1.29x	1.30x	1.32x	1.33x

Note: Any estimates and projections have been prepared by or in consultation with Freddie Mac management, were obtained from publicly available sources, or are based upon such estimates and projections.

Discounted Cash Flow (cont.)

($ in millions)

No G Scenario

	12/31/13	12/31/14	12/31/15	12/31/16	12/31/17	12/31/18	12/31/19	12/31/20	12/31/21	12/31/22	12/31/23
Beginning Balance Equity	$500	$502	$458	$426	$391	$390	$389	$388	$387	$386	$384
Net Income	142	125	103	108	115	114	114	113	112	111	109
Issuance of Equity / (Dividends)	(140)	(168)	(135)	(143)	(116)	(115)	(115)	(114)	(113)	(112)	(110)
Ending Balance Equity	$502	$458	$426	$391	$390	$389	$388	$387	$386	$384	$383
Cash Flows	$140	$168	$135	$143	$116	$115	$115	$114	$113	$112	$1,317
Discounted Cash Flows	122	127	88	81	57	49	43	37	32	27	276

Valuation (PV)	$938

Sensitivities Analysis

Valuation (Present Value)

		Exit Multiple (BV)				
		3.10x	3.13x	3.15x	3.18x	3.20x
Cost of Equity	13.9%	$1,005	$1,007	$1,009	$1,012	$1,014
	14.6%	$969	$971	$973	$975	$977
	15.3%	$934	$936	$938	$940	$942
	15.9%	$902	$904	$906	$908	$910
	16.6%	$871	$873	$875	$877	$878

Implied Entry Price to Book Value

		Exit Multiple (BV)				
		3.10x	3.13x	3.15x	3.18x	3.20x
Cost of Equity	13.9%	2.01x	2.01x	2.02x	2.02x	2.03x
	14.6%	1.94x	1.94x	1.95x	1.95x	1.95x
	15.3%	1.87x	1.87x	1.88x	1.88x	1.88x
	15.9%	1.80x	1.81x	1.81x	1.82x	1.82x
	16.6%	1.74x	1.75x	1.75x	1.75x	1.76x

Note: Any estimates and projections have been prepared by or in consultation with Freddie Mac management, were obtained from publicly available sources, or are based upon such estimates and projections.

Cost of Equity Considerations

CAPM – Guarantee Scenario

Guarantee Scenario

Assumptions

- Used a broad range of specialty finance and regional banks comparable companies as a basis for MFI's Beta build

  - Limited number of public companies that focus solely on multifamily originations and have a government guarantee

  - Given that Freddie Mac is a specialty finance name that will have more favorable funding costs similar to regional banks with deposit funding under the Guarantee, Barclays believes the market will view MFI as a blend of the two

- Assess MFI's Beta by using the unlevered Betas of the comparables and relevering the average unlevered Beta using MFI's average long-term debt to equity ratio of 1.5x in the Guarantee

  - To unlever Beta, we used total debt to equity rather than differentiating between funding vs. corporate debt as the market's view is that equity holders will perceive all debt equally in terms of impact to the volatility of a given company's earnings stream

- To build MFI's cost of equity, we used a 30-year Treasury bond as the benchmark for risk-free rate and added a size premium of 1.7% and market risk premium of 6.6% per Ibbotson's

Beta of Comparable Companies

Comparable Companies	Levered Beta	Debt / Equity [1]	Unlevered Beta
Sallie Mae	1.377	22.5x	0.095
CIT Group	1.452	3.7x	0.448
Ocwen Financial	0.722	0.5x	0.549
PHH	1.500	5.3x	0.358
Walter Investment Management	1.283	2.1x	0.566
Walker & Dunlop	0.836	2.4x	0.346
HFF, Inc.	2.547	0.4x	2.022
U.S. Bancorp	0.982	4.9x	0.250
PNC Financial	1.196	8.5x	0.197
BB&T	1.029	7.6x	0.186
SunTrust	1.436	9.9x	0.207
Fifth Third	2.136	7.4x	0.392
Regions Financial	1.493	10.9x	0.198
Key Corp.	0.890	9.0x	0.140
Comerica	1.156	9.5x	0.172
Average	1.336	7.0x	0.408
MFI	0.788	1.5x [2]	0.408

Capital Asset Pricing Model (CAPM)

Risk-free Rate (r_f)	1.5%
(+) Beta (B_l)	0.79
(x) Market Risk Premium (r_p)	6.6%
	6.7%
(+) Ibbotson Size Premium	1.7%
Cost of Equity	8.5%

BARCLAYS

Freddie Mac

CAPM – No G Scenario

No G Scenario

Assumptions

- Used specialty finance comparable companies as a basis for MFI's Beta build under the No G scenario

  ▸ Limited number of public companies that focus solely on multifamily originations and have a government guarantee

  ▸ Freddie Mac is a specialty finance name

  ▸ The market will view the lack of a guarantee as a disadvantage in funding costs, and would not attribute a bank-like view on it

- Assess MFI's Beta by using the unlevered Betas of the comparables and relevering the average unlevered Beta using MFI's average long-term debt to equity ratio of 2.6x in the No G

  ▸ To unlever Beta, we used total debt to equity rather than differentiating between funding vs. corporate debt as the market's view is that equity holders will perceive all debt equally in terms of impact to the volatility of a given company's earnings stream

- To build MFI's cost of equity, we used a 30-year Treasury bond as the benchmark for risk-free rate and added a size premium of 1.7% and market risk premium of 6.6% per Ibbotson's

Beta of Comparable Companies

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Walker & Dunlop	0.836	2.4x	0.346
HFF, Inc.	2.547	0.4x	2.022
Average	1.388	5.3x	0.626
MFI	1.608	2.6x [2]	0.626

Capital Asset Pricing Model (CAPM)

Risk-free Rate (r_f)	1.5%
(+) Beta (B_l)	1.61
(x) Market Risk Premium (r_p)	6.6%
	12.1%
(+) Ibbotson Size Premium	1.7%
Cost of Equity	13.9%

Alternative to CAPM: Implied Cost of Equity

## Value Proposition of Barclays Approach

- The Capital Asset Pricing Model is the underpinning of most corporate and investor valuation models and has served well in stable market environments

- However, in periods of market dislocation, CAPM underestimates the true cost of equity

  ▸ Views of volatility have not been consistently captured by CAPM

  ▸ Changes in investor expectations around equity risk premiums are not typically captured by CAPM estimates

- Barclays approaches cost of equity differently by incorporating the market's current view of volatility

- Leveraging current listed options, we can develop a market based view of equity risk premium and overall weighted average cost of capital

  ▸ Enhancing DCF valuations

  ▸ Providing market-based investment hurdle rates

Comparative Views On The Cost of Equity

Jan 2007 – Sep 2009 (Credit Crisis)
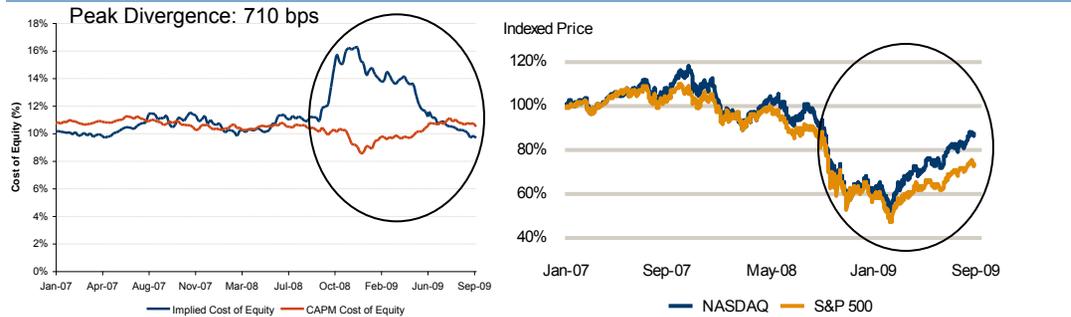
2002 (Post Tech-Bubble Burst)

1998 (LTCM Failure)

69
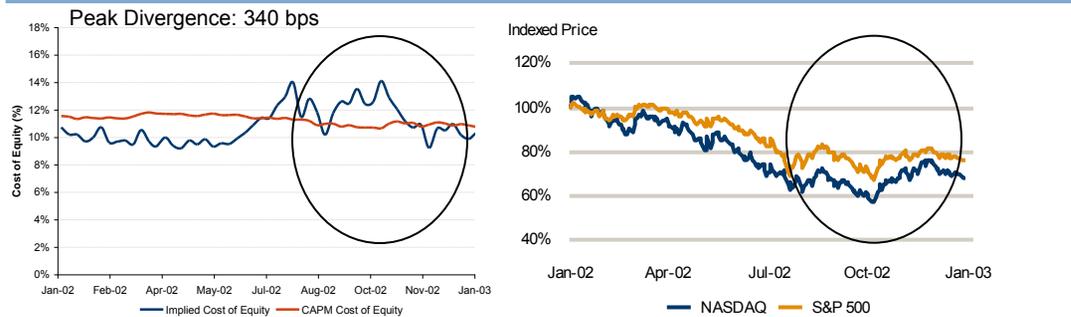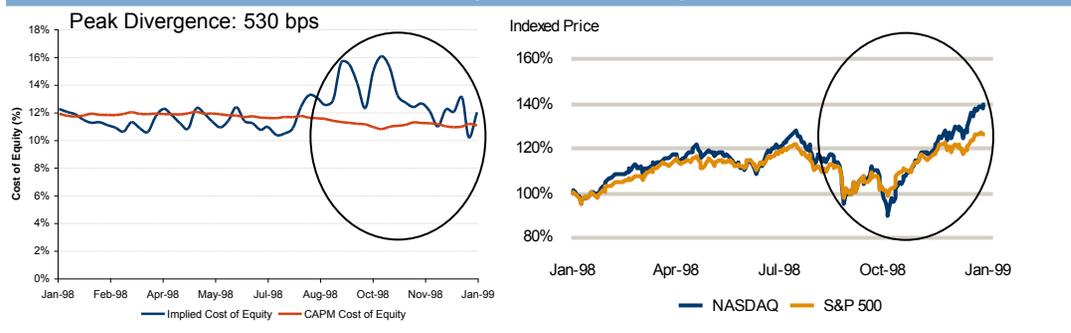
Implied Cost of Equity Calculation Overview

A market implied cost of equity can be estimated using implied volatilities from the options market, or fundamental estimates of business volatility

Description of Implied COE Methodology

- Cost of equity must be greater than the cost of debt, due to subordination in capital structure[1]
  - **Cost of Equity > Cost of Debt**

- Cost of Debt is readily observed in the market
  - **Cost of Debt = Risk Free Rate + Credit Spread**

- To determine excess return required by investors to hold equity instead of debt, we calculate cost of a put option that protects against realizing a lower expected return[2]
  - **Cost of Equity = Cost of Debt + Excess Required Return**

- Excess Required Return can be derived from traded options and calculated in 4 steps:
  - ① Calculation of forward breakeven stock price
  - ② Estimation of future stock volatility
  - ③ Calculation of cost of downside insurance in dollars
  - ④ Translation into annualized "excess equity return"

Implied Cost of Equity Estimates

	Guarantee	No G
Term	2 Years	2 Years
Current Stock Price	100.00%	100.00%
Annualized Dividend	2.00%	2.00%
Dividend Yield (R_{div})	2.00%	2.00%
Cost of Debt (R_d)	4.00%	4.00%
Min Capital Gain ($R_d - R_{div}$)	2.00%	2.00%
① Forward Stock Price	104.04%	104.04%
② Implied Volatility	33.24%	44.51%
③ Put Struck at Forward Price	17.83%	23.71%
④ Annuitized Put Price	9.45%	12.57%
Implied Cost of Equity	**13.45%**	**16.57%**

Note: Cost of equity displayed based on 2-year horizon; in theory, a full term structure could be created to illustrate perceived risk over time. Cost of debt based on estimated Term ABS rates. Implied volatility based on median of comp set.
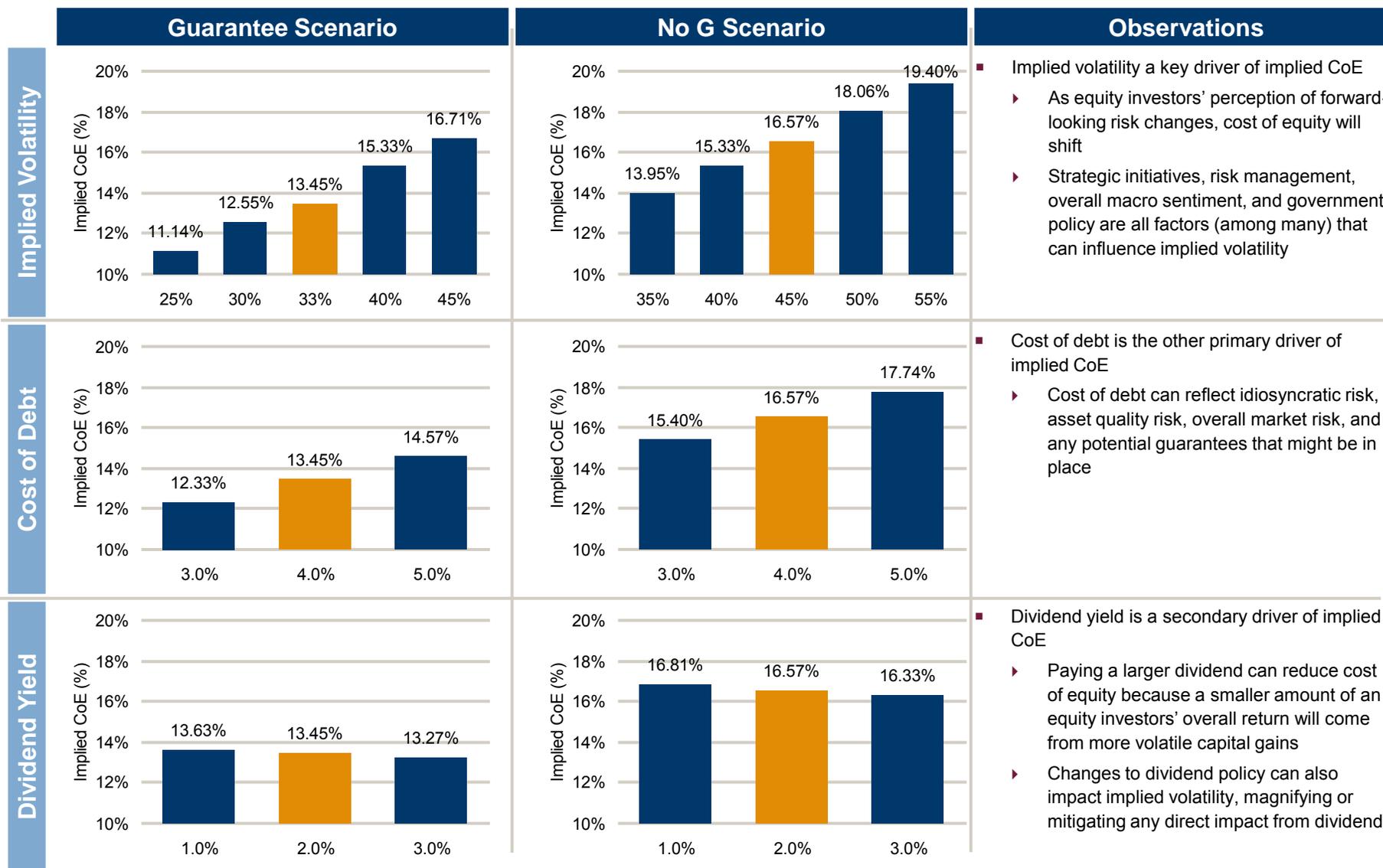1. $ROE \equiv R_e = R_{cg} + R_{div}$.
2. The put has a strike price determined by the minimum acceptable return of the stock in T years. This minimum amount is $1 + R_d - R_{div}$ so Strike $K = S_0 * (1+R_d - R_{div})^T$.
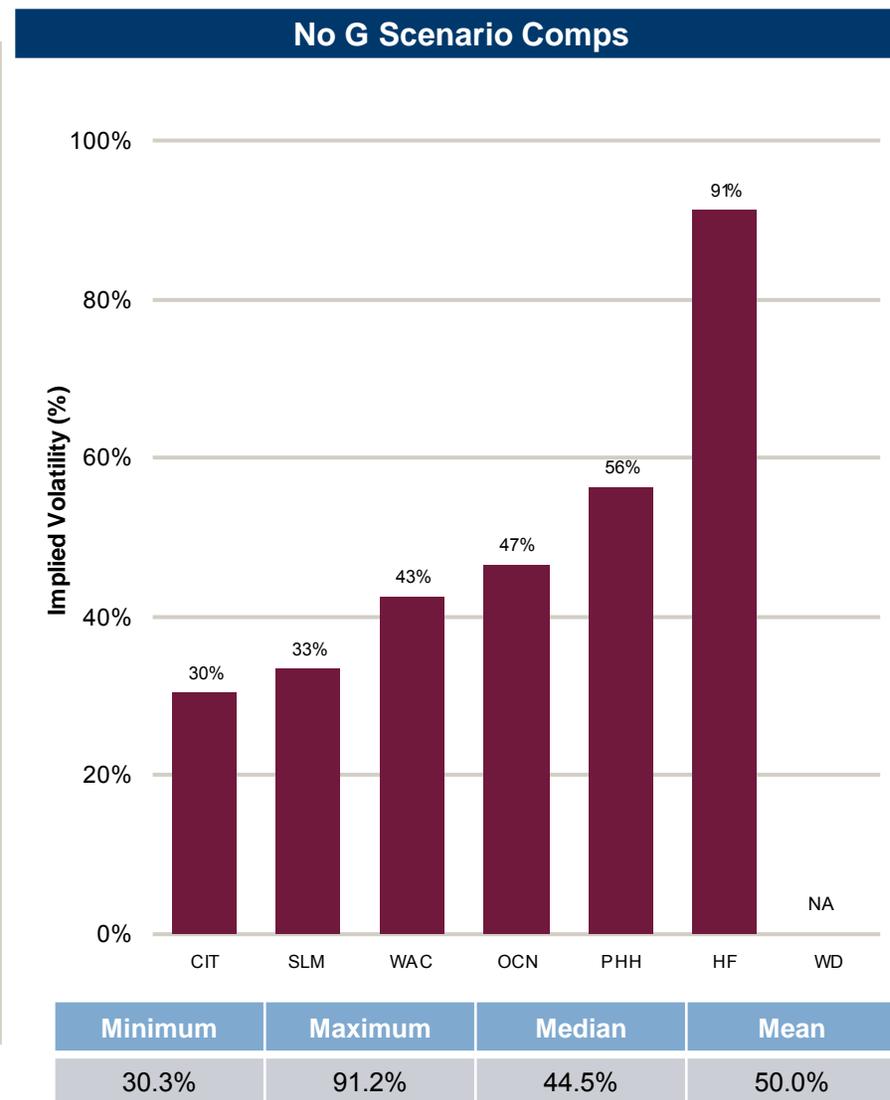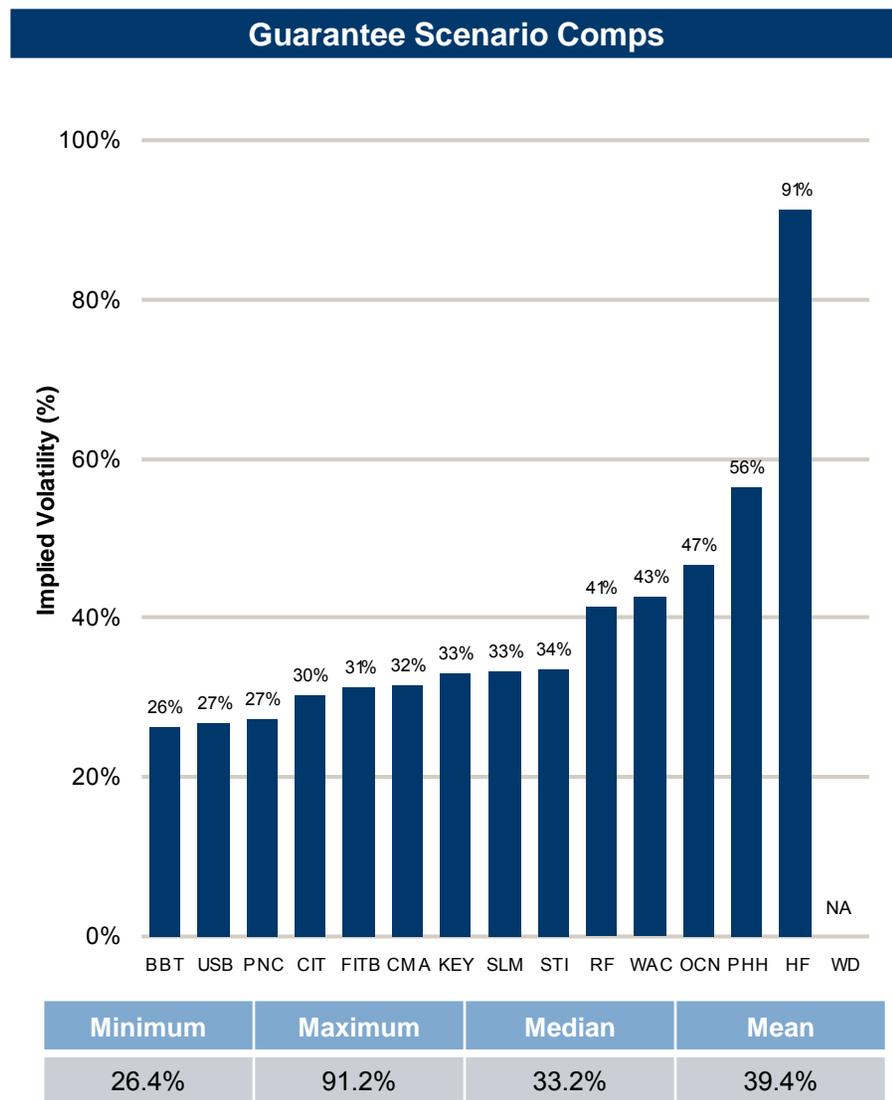
Implied Cost of Equity Sensitivities

Key inputs to implied cost of equity are implied volatility, cost of debt, and dividend yield

Peer Implied Volatility Landscape

Guarantee Scenario Comps

Minimum	Maximum	Median	Mean
26.4%	91.2%	33.2%	39.4%

No G Scenario Comps

Minimum	Maximum	Median	Mean
30.3%	91.2%	44.5%	50.0%

Ratings and Implications

Ratings Considerations

Investment-grade ratings are difficult to achieve for monoline, wholesale-funded finance companies

Background	▪ Ratings landscape currently changing as agencies are modifying methodologies to reflect perceived increased risk of the financial service companies and banking business models ▪ Moody's has recently published an update to its methodology for rating finance companies (March 2012), reflecting the insights gained from the recent global financial crisis

Key Ratings Factors	▪ Franchise positioning
	  ▸ Market position and sustainability
	  ▸ Operational diversification
	▪ Risk positioning
	  ▸ Potential volatility of assets and / or cash flows
	  ▸ Risk and liquidity management
	
	▪ Operating environment
	  ▸ Susceptibility to event risk
	▪ Financial factors
	  ▸ Profitability
	  ▸ Liquidity
	  ▸ Capital adequacy
	  ▸ Asset quality

Impact on Ratings	▪ Key presumption of the revised finance company rating framework is that monoline finance companies reliant on wholesale funding are less likely to achieve investment grade ratings on a standalone basis than was previously possible prior to the financial crisis
Achieving IG	▪ Unless substantially mitigated (internally or through external / parental support), these characteristics can make it difficult for a finance company to achieve an investment grade rating ▸ Moody's expects that median finance company baseline credit assessment (BCA) will be approximately Ba2

The IG Line	▪ The following distinctions are laid out by Moody's with regard to Operational Diversification:
	  ▸ Baa: *Significant multi-line operations in (i) one large market or (ii) multiple midsized markets where >25% of profits from outside primary market. Markets must also be lowly correlated and enjoy well diversified economies*
	  ▸ Ba: *Significant multi-line operations in one midsized market or multiple local markets. Markets must also be lowly correlated and enjoy reasonably diversified economies; OR a monoline with an international footprint, good exposure granularity (e.g., asset, customer, etc.), a large target market, and a complete product array*

While a guarantee structure may notch MFI up one rating category, we view MFI on a standalone basis to be a candidate for a low BB or high B category rating

Source: Moody's.

Credit Rating Comparison

Ratings and Implications

	GE Capital	SallieMae	PHH Corporation PHH	ILFC	OCWEN
Rating	Baa1 / a (1)	Ba1 / BBB-	Ba2 / BB-	Ba3 / BBB-	B1 / B
Diversity	✔ Business Geography Product	☒ Student Loans U.S.-focused	– Fleet and Mortgage	☒ Monoline Finance Company	☒ Monoline Finance Company
Funding	Diverse sources of funding: Deposits Wholesale Unsecured	Diverse sources of funding: Deposits Wholesale Unsecured	Primarily wholesale, though some unsecured and convert	Combination of ECA, wholesale, secured and unsecured bonds, sub debt	Primarily wholesale, though some secured term loan and LOC
Size	Assets: $559 bn	Assets: $189 bn	Assets: $9 bn	Assets: $40 bn	Assets: $5 bn
Parent	Strong parent support, though Baa1 reflects standalone	N/A	N/A	No support from parent	N/A

Liquidity and Capital Adequacy

Moody's focuses on liquidity and capital adequacy as key metrics in its ratings assessment process; mortgage related companies are treated more conservatively

Liquidity					

- Moody's considers liquidity in both its financial and non-financial assessment, underscoring the importance of liquidity in ratings

- Moody's quantifies liquidity based on the sum of a company's unrestricted cash and cash equivalents and revolver availability divided by its debt maturities coming due over the next 24 months

- For example a mortgage company with a calculated 70 - 85% coverage ratio would be considered to have B-category liquidity

	Aa / A	Baa	Ba	B	Caa
24 Month Coverage Ratio	≥ 100%	≥< 85% - 100%	≥< 70% - 85%	≥< 50% - 70%	< 50%
Secured Debt / Gross Tangible Assets	≤ 10%	≥< 10% - 20%	≥< 20% - 35%	≥< 35% - 60%	> 60%

Capital Adequacy					

	Aa / A	Baa	Ba	B	Caa
	≥	≥<	≥<	≥<	<
TCE / Tangible Managed Assets					
Traditional Finance Company	16%	12% - 16%	8% - 12%	4% - 8%	4%
Operator Lessor	27%	20% - 27%	14% - 20%	11% - 14%	11%
Business Deveopment Company	67%	60% - 67%	55% - 60%	50% - 55%	50%
Debt / EBITDA	≤ 2.5x	≥< 2.5x - 3.0x	≥< 3.0x - 4.0x	≥< 4.0x - 5.5x	> 5.5x

Source: Moody's Finance Company Global Rating Methodology dated March 19, 2012.

Portfolio Management

Portfolio Management Fees

Static pool CDOs and externally managed REITs exhibit similar portfolio management characteristics

CDO Fee Comparison						
($ in millions)	Wrightwood Real Estate CDO	Gramercy Real Estate CDO	FMC Real Estate CDO	CapitalSource Real Estate Loan Trust	Arbor Realty Mortgage Securities	Average
Closing Date:	November 1, 2005	August 8, 2007	July 13, 2005	December 20, 2006	December 14, 2006	
Deal Size:	$650	$1,100	$439	$1,100	$600	$778
Collateral:	Primarily Whole Loans	Whole Loans, CMBS Bonds	Whole Loans, B-Notes, CMBS, CMBS CDOs	Whole Loans, Preferred Equity (Sub Debt), CMBS	Whole Loans, CMBS	
Deal Manager	Wrightwood Capital Manager	GKK Manager, LLC (Gramercy)	SCFFI GP (Five Mile)	CapitalSource Finance	Arbor Realty	
Senior Mgmt Fee:	10 bps	-	15 bps	15 bps	10 bps	13 bps
Subordinate Mgmt Fee:	20 bps	-	20 bps	25 bps	15 bps	20 bps
Mgmt Fee on Loans	-	15 bps	-	-	-	15 bps
Mgmt Fee on Bonds	-	5 bps	-	-	-	5 bps
Reinvestment Period	5 yrs	5 yrs	5 yrs	5 yrs	5 yrs	5 yrs

Externally Managed REIT Fee Comparison

REIT Structure Comparables

REIT	Management Fee (bps on Equity)
Ellington Financial	150 bps
Invesco Mortgage Capital	150 bps
PennyMac	150 bps

Implied Management Fee Analysis

($ in mm)

Legacy Portfolio	$140,000
Assumed Equity Requirement	10%
Implied Equity	$14,000
Mgmt. Fee (bps on Equity)	150 bps
Mgmt. Fee ($ in mm)	$210
Implied Mgmt. Fee (bps on Assets)	15.0 bps

Case Studies

Privatization of Sallie Mae

Privatization of Sallie Mae
1997 – 2003
$100 billion in new asset funding

Company Overview

- Established in 1972, SLM Corporation, known as Sallie Mae ("SLM" or "Sallie"), is engaged in the business of originating, servicing and collecting student loans

- Provides funding, delivery and servicing support for education loans through the participation in the Federal Family Education Loan Program

  ‣ Servicer of loans for the Department of Education and through its non-federally guaranteed Private Education Loan programs

- Other services include:

  ‣ Student loan and guarantee servicing

  ‣ Loan default aversion

  ‣ Defaulted loan collection

  ‣ Processing and information technology to educational institutions

Privatization of Sallie Mae

Pre-Transition

- Established in 1972 to provide a secondary market for the guaranteed student loan program

- Authority to borrow with explicit federal guarantee from FFB

- Lower capital and higher leverage than competitors

- Specialization and economies of scale in servicing

- Governed by the U.S. Treasury ("UST") and the Secretary of Education

Originations Outstanding				
1975	1980	1985	1990	1995
$0.3bn	$2.7bn	$13.4bn	$39.0bn	$47.5bn

Transition

- In 1993 political risk materialized

  ‣ 30bp offset fee charged on borrowings

  ‣ New Federal Direct Loan Program created to compete with the existing federal guaranteed loan program by making direct loans to borrowers

- 1996 Sallie Mae Privatization Act established a framework that mapped out a transition ending no later than 2008

- Spent $36 million to repurchase warrants from the District of Columbia and $5 million to retain "Sallie Mae" name from UST

- GSE operations continued to be governed by the Treasury and Department of Education

  ‣ Authority over non-GSE activities if they would materially impact GSE operations

Privatization of Sallie Mae

Post Transition

- Sallie Mae transitioned into a private company four years ahead of schedule
  - ▸ Refinanced $100 billion of assets with securitizations and unsecured holding company debt
- Expanded vertically and horizontally through acquisitions of Nellie Mae, operations for USA Group, Noel-Levitz, debt collectors GRC, AMS and AFS and Upromise
- Department of Education continues to govern the servicing of Federally insured student loans

Originations Outstanding				
1998	2000	2004	2006	2010
$46.4bn	$67.5bn	$107.5bn	$142.1bn	$184.3bn

Key Takeaways

- Sallie Mae's initial funding benefit was minimized with the increase in fees in 1993
- A wind down period was created where Sallie Mae could still utilize the GSE benefits through the liquidating GSE if the securitization market or funding alternatives took longer than expected
- The removal of GSE status allowed the company to diversify beyond just purchasing federal student loans in the secondary market
- Sallie Mae has managed to maintain many GSE attributes while expanding their business beyond their initial chartered scope
  - ▸ Lower capital and higher leverage
  - ▸ Ability to grow much faster than its competitors
  - ▸ Specialization in a particular market
  - ▸ Perception that government support may still be available in times of crisis
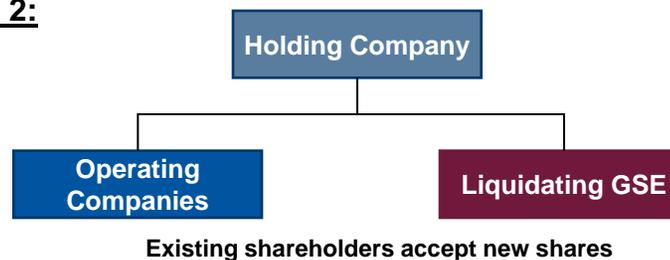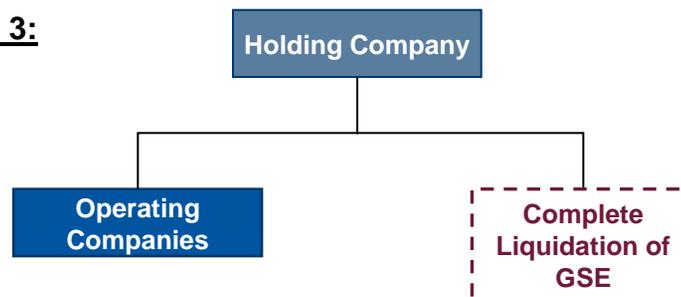
Privatization Framework

Pre-Transition

GSE

Transition

Step 1:

Holding Company

Asset and Systems Transfer

GSE

Step 2:

Holding Company

Operating Companies — Liquidating GSE

Existing shareholders accept new shares

Step 3:

Holding Company

Operating Companies — Complete Liquidation of GSE
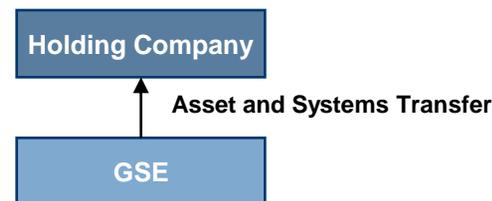
Privatization of Sallie Mae

Sallie Mae's privatization resulted in a rating change from Aaa/AAA to A1/A[1], and a significant increase in cost of funding prior to rate change
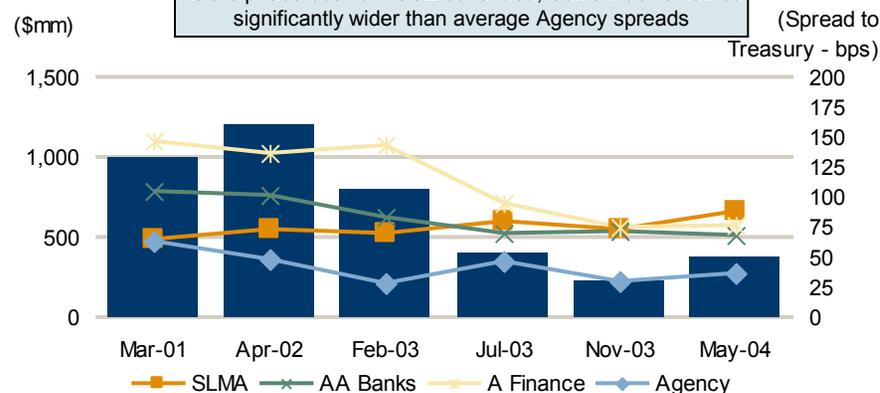
First Unsecured Debenture In 2000

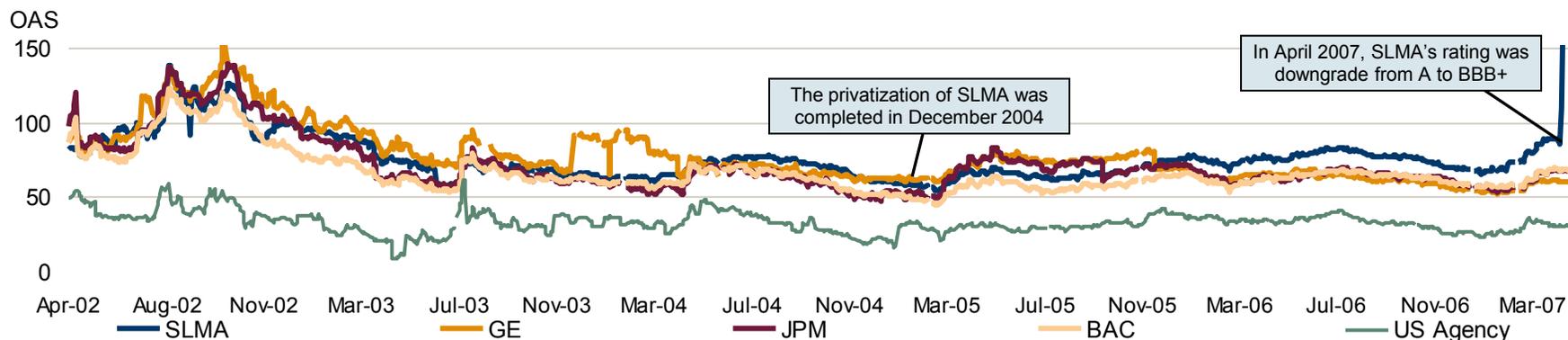SLMA's non-agency 2 year debt transaction in Q3 2000, priced ~40-47 bps higher than similar GSE 2 year debt
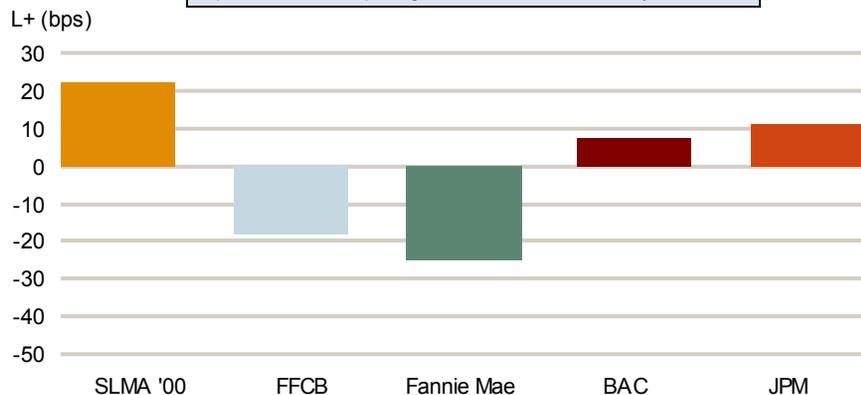
Select Sallie Mae 5 Year Fixed-rate Transactions

As the phase out from GSE continued, Sallie Mae remained significantly wider than average Agency spreads

As a Private Entity, SLMA Traded Similarly To A-rated Banks And FinCos, Until Credit Rating Downgrade In 2007

In April 2007, SLMA's rating was downgrade from A to BBB+

The privatization of SLMA was completed in December 2004

Source: Barclays Capital, Bloomberg as of April 12, 2011.
1. *Current Rating is Ba1/BBB-.*

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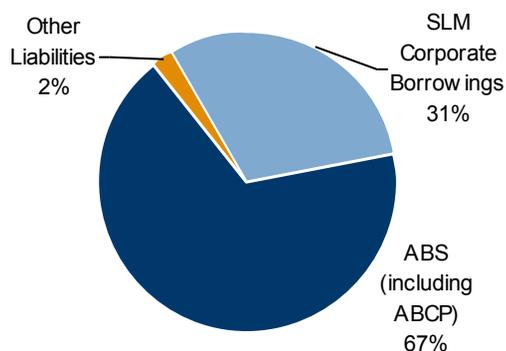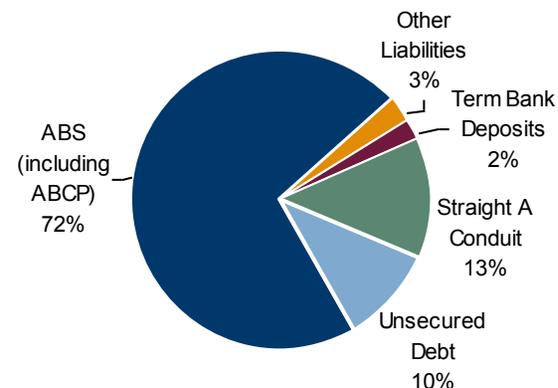
Sallie Mae's Cost of Funding Transition

Case Studies

Funding Strategy

SLMA Funding – 1996 ($54bn)

Other Liabilities 3%
ABS 12%
GSE Debt 85%

SLMA Funding – 2004 ($125bn)

Other Liabilities 2%
SLM Corporate Borrowings 31%
ABS (including ABCP) 67%

SLMA Funding – 2010 ($194bn)

Other Liabilities 3%
Term Bank Deposits 2%
Straight A Conduit 13%
Unsecured Debt 10%
ABS (including ABCP) 72%
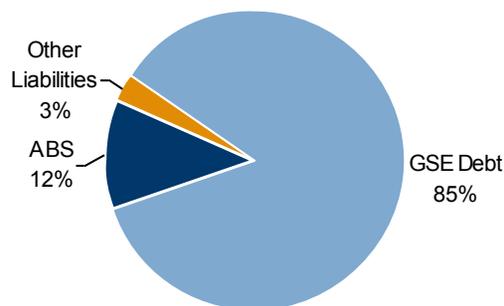
SLM Corp Debt Issuance

SLMA Corp issued its first unsecured debenture in October 2000, pricing 44 bps above GSE's cost for similar debt. In 2001, the holding company issued short-end paper, with spreads to Agency ranging from 40-60 bps

($mm)
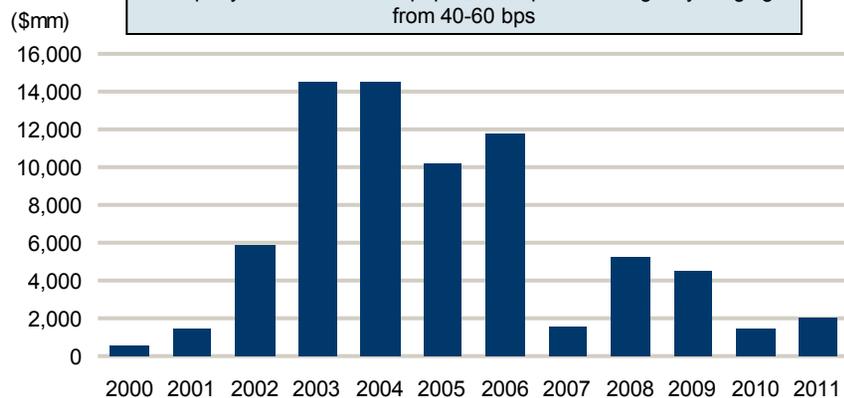
Debt Spreads vs Agency

Over time, spreads to Agencies at issuance tightened and the gap compressed further in the secondary market

(bps)

At Issuance | Average Trade

BARCLAYS

80

Freddie Mac
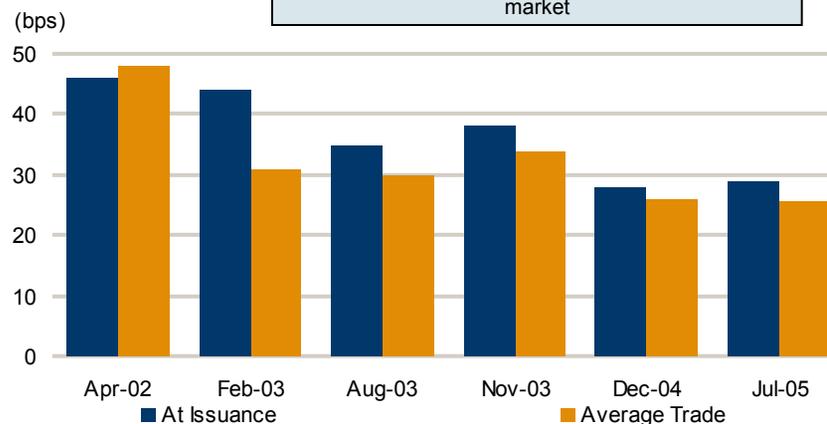
Walker & Dunlop, Inc.

Walker & Dunlop represents one of the few available public comparables for MFI

Company Overview

- Walker and Dunlop (NYSE: WD) is a commercial real estate finance company primarily focused on multifamily lending and servicing
  - Originates, sells and services a range of multifamily and other commercial real estate finance products
  - Products include first mortgage loans, second trust loans, supplemental financings, construction loans, mezzanine loans, bridge/interim loans and equity investments
  - Originates and sell loans through GSEs and HUD programs
- WD listed on the NYSE on December 14, 2010
- In 2011, Walker & Dunlop originated $4.0 billion in commercial real estate financing
- As of June 30 , 2012, the company serviced $17.6 billion of commercial mortgages and managed over 1,800 properties across the country

CWCapital Transaction

- On June 6, 2012, Walker and Dunlop announced a deal to acquire Needham, Massachusetts-based CWCapital LLC from CW Financial Services LLC, a subsidiary of Fortress Investment Group
  - CWCapital is a leading lender and servicer to the multifamily, healthcare and commercial real estate industries
  - Origination capabilities include Fannie, Freddie, FHA, lifecos and conduits
  - ~180 employees at the time of the deal announcement
- The deal was valued at $220 million at announcement, representing an 8.8x LTM earnings multiple and 1.46x book value as of March 31, 2012
  - Deal consideration of $80 million in cash and ~$140 million in WD stock
- The transaction creates the second-largest multifamily lender and eighth-largest commercial real estate lender in the U.S.
  - The firms originated a combined $7.7 billion in commercial loans in 2011 and serviced $33 .7 billion of UPB as of March 31, 2012

Originations

($ in mm)

Market Performance and Valuation
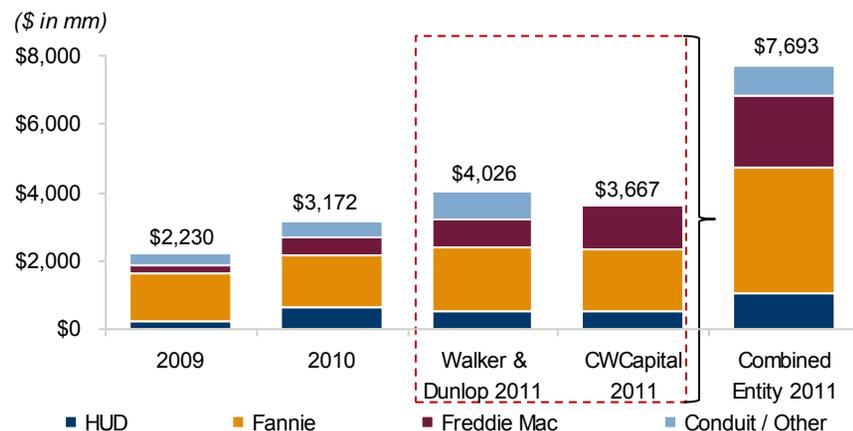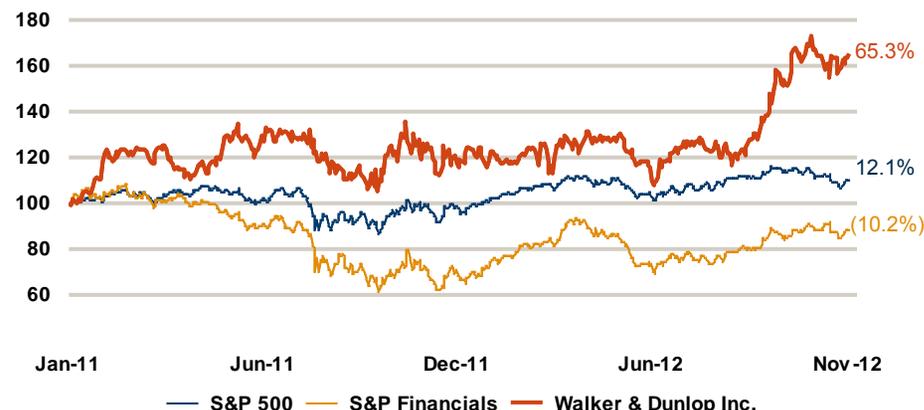
($ in millions, except per share)		Metric	Multiple
Price (as of 11/23/12):	$16.68	2012E EPS:[1] $1.90	8.8x
Market Cap:[2]	$577.4	2013E EPS:[1] $2.20	7.6x
		9/30/12 Book Value:[2] $339.8	1.70x

Source: Company filings, SNL Financial, FactSet as of November 23, 2012.
1. Median IBES consensus estimate.
2. Pro Forma for acquisition of CWCapital.

Morgan Stanley

(Redacted)

In lieu of redacted Morgan Stanley report, an Executive Summary of their report is included herein.

![Freddie Mac logo] **Freddie Mac**
We make home possible™

Freddie Mac Multifamily Initiative

Executive Summary

October 15, 2012

Morgan Stanley

Morgan Stanley & Co. LLC
1585 Broadway
NYC, NY 10036

Disclaimer

I.   Assignment

Morgan Stanley was asked to advise on the viability and estimated value of a possible Multifamily Independent entity ("MFI") in various constructs, including without a government guarantee, in response to a recent Federal Housing Finance Administration ("FHFA") directive. Specifically, Morgan Stanley was asked to provide views on how MFI could exist as a standalone entity, with specific focus on the following criteria:

- Capital structure / cost of capital
- Guarantee Fee ("G-Fee")
- Operations (e.g. impacts to business model)
- Market volumes and MFI market share

In the context of these criteria, Morgan Stanley was asked to assess five different scenarios:

1. Government Guarantee: guarantee provided to a limited number of entities
2. Increased Competition: guarantee available to all qualified firms in the sector
3. Guarantee Wind-Down: guarantee available for specified period of time (e.g. 7 or 10 years)
4. Limited Guarantee: guarantee available on securities backed by collateral that is affordable only
5. No Guarantee: guarantee eliminated immediately

Morgan Stanley was asked to provide both a quantitative and qualitative assessment of each alternative, with direction to focus on the Government Guarantee and the No Guarantee scenarios, given early on in the process.

II.   Analysis Completed

Business Model Assessment
(Assumes assessment of business model for the Government Guarantee scenario)

Over the past three months, Morgan Stanley utilized the full breadth of its capabilities to analyze MFI's pro-forma business, drawing on expertise from a variety of sources: Financial Institutions Banking; Real Estate Banking; Global Capital Markets; Ratings Advisory, Securitized Products and Mortgage Trading & Structuring.

Morgan Stanley assessed (1) the MFI business model, (2) the pro-forma construct of the G-Fee, (3) how MFI would be capitalized, (4) rating agency implications and (5) alternative options for HFI origination (REIT).

As a standalone entity, MFI will have a monoline business model, focusing on originations and securitizations. It will also utilize its competency to manage third-party assets. Balance sheet will be leaner and the business operated more efficiently in the future.

Dimension	Morgan Stanley View
Operations	• <u>K-deal funded pipeline</u>: Needs to operate more efficiently in context of a higher cost of capital and limits of warehouse line capacity in order to manage credit risk of HFS prior to securitization given size of new MFI entity. Reduce existing backlog to ~[1 - 2 months] of originated assets • <u>MFI REIT</u>: New loans previously targeted for HFI are placed into an externally advised mortgage REIT. MFI earns management fees for managing REIT • <u>Securities portfolio</u>: Excess MFI liquidity invested in high quality securities portfolio (RMBS, CMBS and other high-quality, low-risk instruments) in order to generate a higher return than cash • <u>Trading assets</u>: MFI maintains a limited trading assets portfolio ($500MM in Government Guarantee scenario and $250MM in No Guarantee scenario) to take advantage of market inefficiencies and capture attractive risk-adjusted returns

G-Fee	• G-Fee is split between Treasury and MFI. Treasury is compensated at "market" rate for the risk it is taking • Proposed G-fee split would maintain MFI's funding advantage over private market participants and compensate both MFI and treasury for risk • Treasury receives 12bps G-Fee (Treasury holds 1.2% of the off-balance sheet guarantee portfolio based on comparable requirements for insurance risk-based framework and earns 10% return on capital [1]) • In similar logic to Treasury, MFI would require 12bps guarantee fee. Required capital for the guarantee is already included in the overall capital target for MFI
Capitalization	• Capitalization of this new entity will seek to achieve a low single A rating, incorporating uplift for unique market positioning, but likely will not receive better than a BBB rating in the Government Guarantee scenario due to concerns with respect to the monoline business model and need to demonstrate future profitability • Equity required to achieve an investment grade rating in the Government Guarantee scenario is greater of 4% of tangible managed assets ("TMA") or 15% (25% in the context of no guarantee) of on balance sheet assets in Moody construct • Potential for additional ratings boost if MFI successfully argues that the TMA number, which includes the full value of the off-balance sheet K-series securitizations, is too punitive considering MFI will sell off the riskiest bottom 15% piece • K-Deal pipeline funded through warehouse line with varying advance rates and costs of funding
Rating Agency Implications	• The rating agency analysis was based primarily off of Moody's published scorecard for finance companies, as well as examination of other relevant frameworks for government-related issuers, asset managers, and other mortgage-related enterprises. Preliminary conversation with Moody's credit analysts was also informative • While strong equity metrics, favorable market positioning, management expertise and the liquidity structure of the pro forma MFI entity appear to be ratings positives, analysts expressed significant concern with the monoline nature of the business and a desire to see demonstrable future profitability and ability to attract and retain stable private capital for the enterprise
HFI Origination	• An externally managed REIT could represent an efficient mechanism for capitalizing on HFI loan opportunities as well as provide an attractive and highly scalable source of revenue for MFI • The REIT can be structured as a long-term owner and manager of loans that provide attractive risk-adjusted returns, but are not securitization eligible • Management fee equal to 1.5% of average equity • REIT investments need to be evaluated on a third-party basis as there is a potential conflict between MFI and the REIT

(1) Long-term average return on capital for U.S. thrift industry

Market Volume Assessment

Total market volume and assumed MFI market share drivers have the largest impact on the ultimate valuation of MFI. As such, Morgan Stanley spent significant time over the last three months evaluating volume assumptions. Below is a summary of our volume analysis.

Total Multifamily Market Volume   **Total Freddie Mac Multifamily Volume**
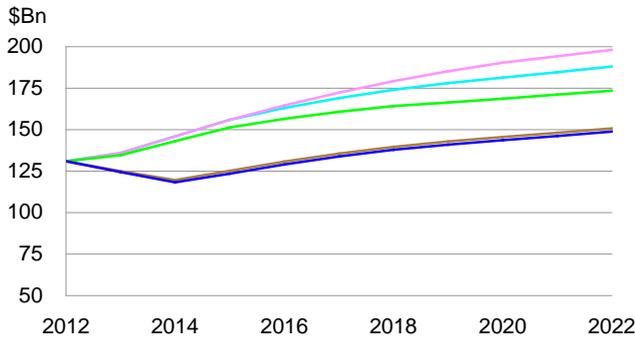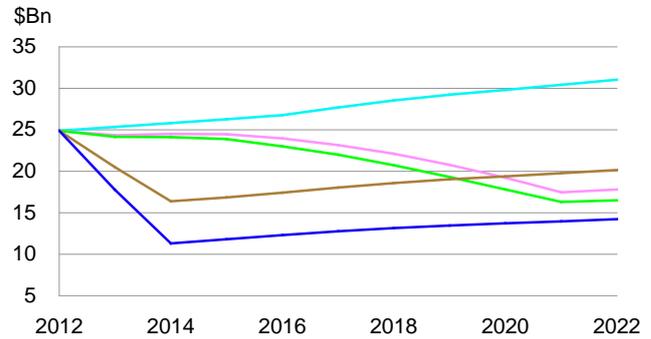
1 - Government Guarantee Scenario

- Total market volume growth is consistent with current trajectory as macroeconomic demand drivers support robust market outlook
- MFI maintains consistent volume growth over time as K-deal securitizations grow and new competitors are slow to gain market share
- Loan parameters (e.g. LTVs) remain consistent with no major shocks to the financing market

5- No Guarantee Scenario

- Total market volume declines 5% for each of the first two years as the market adjusts to increased market pricing, then grows at a similar rate as scenario 1
- Conventional refinancings (~81% of the market) are still completed, albeit at (~42bps) higher rates (loans that meet K-deal standards can also get financed through private securitizations with no guarantee)
- Target affordable loans (~10% of the market) experience a more dramatic decline; 40% of target affordable loans (those collateralized by non-coastal properties) are no longer completed
- MFI's market share decreases from 20% to 9% by year 3 as it no longer has a pricing advantage
- Overall cap rates expected to expand ~5-15bps and loan amounts decrease ~1.25-2%

Valuation and Qualitative Assessment

Morgan Stanley constructed a model and performed a detailed analysis of the five scenarios outlined in the Request For Proposal.

From a quantitative valuation perspective, we assessed each alternative on a discounted cash flow (DCF), internal rate of return and multiple of invested capital (MOIC) basis. From a qualitative assessment perspective, we used a framework of six key objectives to evaluate each alternative:

    (1) Provides orderly liquidity to the market even in times of stress
    (2) Does not raise the cost to borrower
    (3) Withstands market cycles
    (4) Reduces government liability
    (5) Attractive to private capital
    (6) Supports affordable housing goals

A Summary of our assessment of each is below in Section III.

III.   Scenario Analysis

1 - Government Guarantee

DCF Valuation: $3.3 - $4.3Bn
MOIC: 3.1x - 3.8x
Initial Invested Capital: $1.4Bn

Benefits:	**Considerations:**
• Deep liquidity pool • Lowest cost to borrowers • Unlikely to disrupt multifamily market in times of stress • Economics and guarantee likely to attract significant private / public capital • Provides support for low income multifamily housing	• Government exposure remains through issuance of guaranteed K-series deals and affordable products although government is compensated at market for risk

2 - Increased Competition

DCF Valuation: $1.7 - $2.2Bn
MOIC: 1.5x - 1.9x
Initial Invested Capital: $1.5Bn

Benefits:	**Considerations:**
• Deep liquidity pool (similar to scenario 1) • Lowest cost to borrowers (similar to scenario 1) • Unlikely to disrupt multifamily market in times of stress (similar to scenario 1) • Economics will attract private / public capital at a higher cost of capital • Provides support for low income multifamily housing	• Government exposure remains through issuance of guaranteed K-series deals and affordable products • More difficult to manage increased risk of multiple market entrants with access to guarantee

3 - Guarantee Wind-Down

DCF Valuation: $1.6 - $2.2Bn
MOIC: 1.1x - 1.4x
Initial Invested Capital: $2.0Bn

Benefits:	Considerations:
• Provide all the benefits of scenarios 1 and 2 initially	• Provides less market stability as guarantee is slowly eliminated
• Government exposure on new loans eliminated after 10 years	• Cost to borrowers gradually rise
• Provides an orderly transition to no government guarantee	• Able to withstand market disruptions initially, but overtime that ability diminishes
• Flexibility in timeframe to unwind	• Creates uncertainty / potential market disruption leading up to event date
• Creates significant option value during guarantee period	• Leaves door open to potential policy changes during wind-down period
	• Comparable government exposure during wind-down period
	• Support for low income multifamily housing is eliminated

4 - Limited Guarantee

DCF Valuation: $1.1 - $1.5Bn
MOIC: 1.2x - 1.3x
Initial Invested Capital: $1.3Bn

Benefits:	Considerations:
• Provides stability to affordable segment	• May not be able to attract private capital
• Spreads on affordable segment remain low	• May be susceptible to "affordable" expansion in times of distress
• Removes government burden from all conventional products	

5 - No Guarantee

DCF Valuation: $0.7 - $0.9Bn
MOIC: 1.6x - 2.0x
Initial Invested Capital: $0.6Bn

Benefits:	Considerations:
• Removes liability to government	• Most disruptive to multifamily market
• Establishes true market pricing by eliminating government guarantee impact	• Cost to borrowers rise
	• Market may "freeze" in times of stress
	• Might be difficult to attract private capital
	• Underserved multifamily markets likely to become "un-financeable"

CBRE's full report on potential multifamily mortgage market impacts of operating the Freddie Mac Multifamily business absent a government guarantee follows.

Market Analysis

CBRE

Impact of the GSEs on the Multi-Housing Market

Analyzing the State of the Market and Potential Changes

Introduction

Following the worst downturn to affect owner housing in decades, the multi-housing rental housing market recovered swiftly from recession. High levels of home foreclosures have reduced the homeownership rate, boosting rental demand significantly. As a result, overall apartment vacancy rates declined sharply: as of mid-2012, the nation's 5.2% apartment vacancy, was well below its peak rate of 7.5% recorded in 2009 and some 20 basis points below its long-run average of the last eighteen years. Nationwide, CBRE-Econometric Advisors' index of effective apartment rents escalated by 5% for the year ended in the second quarter of 2012. A large volume of developer's new construction plans have entered the development pipeline, in response to the apartment market's declining vacancies and rising rents.

The support of multi-housing lending from Freddie Mac and Fannie Mae (the Government-Sponsored Enterprises or "GSEs") played a critical role in fostering the recovery of the multi-housing rental housing market. In just over three years, multi-housing debt owned or securitized by the GSEs has grown from close to one-third to just over 40% of all multi-housing mortgage debt outstanding in the market. The GSEs have provided a consistent source of financial liquidity to the market during a period of significant financial stress and contraction among other key providers of multi-housing mortgages, including banks and commercial mortgage-backed securities (CMBS) issuers.

Absent this liquidity, the rental market would likely face challenging conditions. Without stable sources of funding, new development and rehabilitation of the rental housing stock would be diminished. This in turn, would likely limit growth in affordable rental options for over one-third of the nation's households: those whose lifestyle choices or financial situation preclude them from making home purchases. In recent years, the supply of affordable rental units has diminished relative to demand, resulting in declining affordability. Reductions in the development and rehabilitation of units would likely further limit affordable, quality housing options to a large segment of the population.

The significant exposure of taxpayers to multi-housing rental housing finance is a sensitive issue in the current environment in which changes are being considered to the federal government guarantee of the GSE debt. Such changes could have substantial implications for owners, investors, lenders and renters of multi-housing housing properties.

Freddie Mac has asked CBRE Global Research & Consulting to undertake a study of the multi-housing rental finance market, and the potential impact of a withdrawal of the GSEs' Federal government guarantee on the sector. Specifically, Freddie Mac requested an analysis of potential changes in new supply, rents, and various segments of the market, including lender participants and affordable/underserved rental housing markets. In addition, Freddie Mac asked CBRE to provide a broad overview of the current state of the rental housing market, as well as recent trends in the multi-housing housing finance industry. This background information is intended to provide observers and policymakers with a foundation of the current issues facing the multi-housing rental and finance markets.

CBRE presents two methods of identifying and assessing the impacts of a GSE withdrawal on the multi-housing housing finance industry. First, CBRE identifies the direct overall market impact on interest rates, rents and new building supply through the use of an existing CBRE-Econometric Advisors ("CBRE-EA") national econometric model of the multi-housing sector, along with models specifically developed to address specific questions presented by the study's requirements. Second, we develop an argument about the likely impact of the withdrawal on rent burdened/underserved markets using the expertise of CBRE multi-housing investment professionals, and statistics on current GSE lending operations. We also provide an assessment of how lenders could fill a potential void in loan origination volume created by the removal of the federal GSE guarantee.

Throughout the report, the analysis of market variables is based on Freddie Mac's requirement of determining the impact if the multi-housing operations of the GSEs lost their federal government guarantee. This requirement also assumes that there is: (1) no corresponding loss of guarantee on the GSE single-family operations, (2) no substantial change in other state, local, or federal multi-housing operations, (3) essentially a privatization of Freddie Mac's existing multi-housing business, and (4) relatively stability in overall economic and capital market conditions. For the purposes of CBRE's analysis, it is assumed that the loss of guarantee occurs over a short time frame, leading to a potential interest rate shock and disruption in liquidity to the multi-housing finance sector. The impact of the changes in these variables is then viewed against CBRE-EA's baseline outlook for multi-housing, which assumes a fairly steady expansion in multi-housing demand, rents, and new construction over the next few years.

This is a three part report. The first part provides a detailed overview of the supply and demand fundamentals of the multi-housing rental housing market. The second part provides a summary of rental property market ownership and financing conditions, including a study of the influence of the GSEs on multi-housing mortgage loan pricing. The third part details results of CBRE's impact analysis of the removal of the federal guarantee on important national multi-housing measures. The summary below highlights key results from the second and third parts of the report.

Summary of Key Findings

CBRE's analysis finds that a withdrawal of the Federal government guarantee would indeed have a negative impact on multi-housing rental market. Mortgage interest rates for multi-housing properties would increase, and the availability of debt may be restricted, at least over the short-term. In turn, higher financing costs would lower property values, reducing developer's incentives to construct new rental property. With a reduction in the future supply of units, rents would increase above current levels, reducing overall rental affordability.

While CBRE does not provide an explicit numerical value or forecast of the potential reduction in multi-housing debt, CBRE believes that there would likely be a shortfall in available capital for multi-housing owners, at least over the short-term of perhaps one to three years. The multi-housing property classes most likely to be affected by the withdrawal of the federal guarantee would include those that serve affordable housing, secondary markets, and older class B/C properties. However, we believe there is a case to be made that a lending shortfall could be filled fairly quickly, due a large excess global supply of funds currently seeking relatively safe, yield-driven investments.

The following table summarizes the percentage impact, relative to a baseline scenario, of a federal government guarantee removal on important national multi-housing variables. For each variable, we present a range of most likely outcomes that reflects changes in interest rates and on the multi-housing rental market.

Range of Potential Impacts on Multi-Housing Indicators

Multi-housing market variable	Estimated impact, short term (one- to three-years)
Mortgage interest rates	+0.50% to +1.00%
Property values	-4% to -12%
Real rental growth rates	55 to 85 bps per year above 0.3% annual base
Supply of housing units	-16% to -27%

For each of the impacts listed above, we provide a synopsis of the factors which determined the result:

Mortgage Interest Rates

In the first stage of our impact analysis, we construct a model that quantifies the effects of the GSEs activity on multi-housing mortgage loan pricing over recent history. Using information on a variety of fixed-rate multi-housing loan transactions that closed over the past two years -- CBRE Capital Markets' loan transaction database -- we construct a multifactor model to explain loan spreads, or the difference between loan coupon rates and the corresponding U.S. Treasury rate. In the model, loan spreads are a function of specific loan or property characteristics, lender type, and loan term. We find that over the past two years, the impact of the GSEs' credit guarantee, reduced average spreads on multi-housing loans by approximately 61 basis points, while controlling for loan characteristics.

Since non-GSE multi-housing loan pricing may itself be heavily influenced by the existing GSE guarantee, we believe that, in the absence of the GSEs, this impact may be understated. Therefore, we believe appropriate multi-housing interest rate impacts range from +50 to +100 basis points above current levels over the short-term.

Supply of Multi-housing Units

Using the interest rate impacts, we then developed a model to analyze the effect of key financial variables on housing supply. CBRE used an econometric technique – called vector autoregression -- to determine the potential impact of changes in interest rates and multi-housing debt on construction. This model has an advantage in that it does not require an elaborate structural specification of how financial variables influence new multi-housing supply, rather it forms a system of equations that describe the integration of the variables over time. It is assumed that interest rates and debt availability have an influence on the key determinants of new construction, such as rents and capitalization rates. The system may then be shocked by financial variables to determine an impact on new multi-housing supply. Based on interest rate shocks ranging from 50 to 100 basis points, CBRE finds that new construction would be reduced by 16% and 27% over the next 1 to 3 years from a baseline outlook.

Multi-housing Rents

CBRE's structural models of the rental market then determine the impact on rents from the reduction in new rental building supply. From this analysis, CBRE finds that the annual growth rate in real (inflation-adjusted) apartment rents would likely accelerate between 55 and 85 basis points above the base case forecast. Talking about price changes in real terms can be counter intuitive to many people so to put these figures in perspective, on average we expect inflation to come in at about 2% per year over the next three years with a baseline rent growth forecast of 2.3%. (2.3% less 2.0% yielding the 0.3% base shown in the preceding table). The various scenarios we examine have rent growth jumping up to the 2.9% to 3.2% range per year over the next three years up to 3.1% to 3.4% per year over ten years. Given the magnitude of the supply changes one might think that rents increases should be more significant.

In other periods, a reduction in supply of the magnitude highlighted would have a significantly larger impact on rents. In the current market, however, real rents are at their long-run averages. This situation makes the market relatively expensive today and renters cannot absorb price increases in perpetuity. For every one percent increase in real rents, the pace of net absorption would be 10% lower than otherwise anticipated given this relationship. Rents begin to grow only minimally faster than in our base forecast since rental households have choices that can mitigate the price increases that could accompany a change in supply.

The rent increase would reduce rental affordability, exacerbating an overall negative trend that has developed over the past several decades. Renters would also see their housing costs grow faster than their overall expenses. Certain secondary markets, where renters face high rent burdens and may face particular challenges. Liquidity is likely to withdraw disproportionally from these areas, as interviews with CBRE multi-housing investment professionals suggest.

Multi-housing Mortgage Debt Availability

CBRE does not present an explicit numerical impact of the guarantee withdrawal on overall multi-housing mortgage debt availability. However, our models and analysis suggest two negative impacts on mortgage debt availability. A rise in mortgage interest rates would reduce the quantity demanded for funds as borrowers reduce acquisition and development activity. The supply of debt would decline, as the agencies withdraw from the market, and as higher rates impose constraints on owners' capacity to borrow. In our impact analysis, we assume a range of short-term debt reduction from $10 billion-$30 billion on an annual basis. The higher end of the range would represent a generally severe contraction of debt availability, more than double the worst case decline recorded over the last thirty years.

We also determine that an annual financing rate of approximately $50 billion provided by the GSEs would be difficult to fill in the short-term, given the current portfolio lenders' constraints. A well-functioning private commercial mortgage-backed security (CMBS) sectors would be needed to satisfy financing demands. Using a set of broad generalizations, CBRE finds that under optimal conditions where portfolio lenders such as life companies and banks could seamlessly reallocate dollars towards multi-housing lending, and where CMBS lenders would be able to ramp-up loan production to peak rates of the past decade, a financing gap would still exist.

However, while there may be a short-term reduction in the availability of multi-housing debt in response to shock, CBRE believes the magnitude of reduction may be overstated by many market participants, especially after a period of adjustment. The current slope of the yield curve is pushing investors worldwide to seek safe, yield driven assets. With the ten-year Treasury note currently yielding less than 2%, many investors are hungry for yield in new asset classes. In this environment, a worst case scenario in which nearly 40% of outstanding multi-housing mortgage debt is removed and not backfilled with new sources of lending does not seem likely to us.

Multi-housing Property Values

CBRE provides estimate of the impact of the above changes in multi-housing interest rates on property values, using a simple Band of Investment, or Mortgage-Equity valuation technique. For interest rate shocks of 50, 75, and 100 basis points, we calculate an updated capitalization rate for a prototypical multi-housing property based on two scenarios: one where the cost of debt increases, and the other where costs of both debt and equity increase. This technique derives an increase in capitalization rates ranging from 26 to 78 basis points, resulting value declines between -4 and -12%. The method assumes an immediate change in value in response to the interest rate shock.

Section Summary

Part 1 - "State of the Multi-housing Rental Market"

In this section CBRE provides a broad overview of the nation's housing market and how it has been affected by changes in the economy. We examine the relationship between the performance of the single-family owner market and the multi-housing rental market. We profile trends in rental housing demand and supply. The multi-housing investment market has strengthened over the past two years with higher sales and prices.   We find that prospects for continued health of the multi-housing rental sector remain positive, thanks to demographic trends and declines in homeownership rates. While new supply is on the increase, it remains relatively low in most markets.

We then examine the key factors that drive housing demand. These include employment, demographic factors, and homeownership rates. We examine the influence of each of these factors on the rental housing market over time. We provide a forward looking estimate of potential rental demand growth based on demographic changes. We then examine the income characteristics of renters and how these have changed over time. These changes have important implications on rental affordability, which has declined over the past several decades. Rent burdens have been rising, especially among lower income households. Combined with a shrinking supply of affordable units, there is a rising need for low income rental units. We also identify geographic areas where rental housing burdens appear most severe.

Next, we examine the trend in housing supply, including the long-term delivery of multi-housing rental and owner units. Trends in affordable housing development through the Low Income Housing Tax Credit (LIHTC) are discussed. The available supply of rental housing is examined by structure type and across geographic regions. We then assess the potential impact of owner to renter conversions and the supply of rental units. The broad trends in the construction development pipeline are discussed.

Finally, we provide CBRE-Econometric Advisors' Overview and Outlook for the apartment market. This section provides details on recent trends in the apartment market, as well as CBRE's baseline forecast outlook for demand, supply and rents across 60 of the largest markets in the US.

Part 2 – "Nature of the Multi-Housing Business Model"

This section details trends in rental housing ownership and financing over the past three decades. A specific focus is placed on multi-housing lending and the key policy initiatives and changes in the market over recent history. The section presents a discussion of the evolution of secondary market finance in the multi-housing mortgage market, including the development of the GSEs lending capacity and commercial mortgage-backed securities (CMBS). We also look at the recent credit performance of multi-housing debt, impending loan refinance needs, and recent trends in multi-housing loan pricing and underwriting terms.

We then present a model that quantifies the effects of the GSEs activity on multi-housing mortgage loan pricing over recent history. Using observed loan characteristics, spreads and property information we construct a multifactor model which explains loan spreads as a function of these characteristics. We find that over the past two years, the impact of the GSEs' implicit credit guarantee, reduced average spreads on multi-housing loans by approximately 61 basis points, while controlling for loan characteristics.

Finally, we provide a timeline of important policy and market events related to multi-housing finance since the incorporation of Freddie Mac as a private corporation in 1970.

Part 3 – "Impact of Changes in GSEs on the Multi-Housing Market"

This section details analysis potential withdrawal of the GSEs guarantee for multi-housing debt. We first describe the models used in the analysis including the CBRE Econometric Advisors multi-housing market model and a vector autoregressive model used to estimate the historical impact of financial market variables on multi-housing starts. We identify various interest-rate and debt availability shock scenarios and their impact on multi-housing starts.

There are two scenarios presented in this section. The first looks at various interest rate and debt availability shocks and their impact on multi-housing supply and rents. Second, a more extreme scenario is also examined. In addition to the interest rate and debt shocks to multi-housing supply, a shock scenario for single-family lending is introduced. This is a situation single family mortgage credit remains restricted for an extended period. Such restrictions have a significant impact on multi-housing rents.

Part 1 - State of the Multi-Housing Rental Market

Highlights

- Conditions in the rental housing market are improving remarkably well, after the sector suffered through the negative effects of a severe recession and decline in employment. A large component of the recession was caused by an overextension of credit to the homeowner market, which led to a sharp decline in homebuilding, rising foreclosure rates, and distress in the financial sector.

- There are signs that the single-family housing market is beginning to recover with higher sales volumes and prices; and lower foreclosure rates. The downturn in the single-family housing market has actually aided in the recovery of the rental housing market. A sharp decline in homeownership rates, reflecting high levels of foreclosures, has boosted rental demand. In turn, this has led to rising apartment occupancies and rents.

- The recovery of the rental housing market has benefited from low levels of new construction activity. With rents rising, however, development activity is picking up and new projects are entering the pipeline. There is also a risk that additional own to rent conversions will increase the supply of rental housing, mitigating the growth in occupancy and rent, especially in those markets most negatively affected by the housing downturn.

- The multi-housing investment market has strengthened with higher investment sales volumes and prices. While much of the activity has until recently been focused on larger metropolitan areas, the sharp recovery in investment interest has provided a strong signal that new development activity is likely to increase. An expansion of credit from a variety of lenders, including the agencies, has supported healthy investment activity.

- The prospects for continued health in the multi-housing rental sector remained positive. Improving demographic trends, combined with additional expected declines in homeownership, are expected to boost rental demand. There is a risk, however, that strong rental appreciation, combined with sluggish renter income growth could significantly worsen rental affordability, especially for lower-income households.

Market Summary

The rental housing market demonstrated a significant amount of resilience over the past few years, in spite of a severe economic recession, and is improving dramatically with higher occupancies and rents. The recent performance of the rental housing market has been shaped by recession and recovery, as well as the sector's linkages to the single-family owner market. The "Great Recession", which extended from late 2007 through mid-2009, was precipitated by an overextension of mortgage credit to homeowners, and a severe correction in homebuilding activity. While real GDP has since recovered and expanded past its prerecession peak, recent growth rates remain lackluster due to the extended downturn in the housing market, weak hiring, and its negative impact on consumer demand, and the prospect of weakness in the economies of key trading partners, including those in the Euro Zone and in key emerging markets. (Exhibit 1)

Exhibit 1 – Real GDP and Total Nonfarm Employment (YOY % Change)
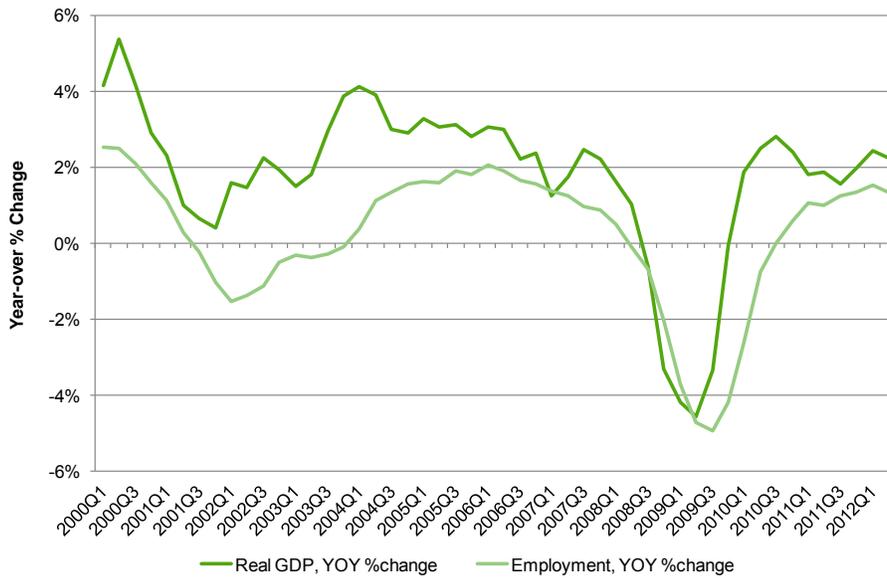
Source: Moody's Economy.com, Bureau of Economic Analysis and Bureau of Labor Statistics

The unprecedented decline in single-family home prices led to a significant number of "underwater" borrowers, whose property values fell below their outstanding mortgage balances. Combined with an extended period of high unemployment, this is resulted in a period of high foreclosure rates and corresponding stress in the financial sector. (Exhibit 2) Despite the recovery in output, the job market – which underpins the performance of the housing market -- remains lackluster. So far, the labor market has recovered slightly more than 4 million jobs out of a total of 8.7 million that were lost between early 2008 and early 2010. Unemployment was measured at 8.1% of the labor force in August 2012, as more than 12.5 million people were actively seeking work. A sluggish employment recovery has in turn slowed the trajectory of the housing market recovery.

Exhibit 2 – Unemployment Rate and Mortgage Foreclosure Rate
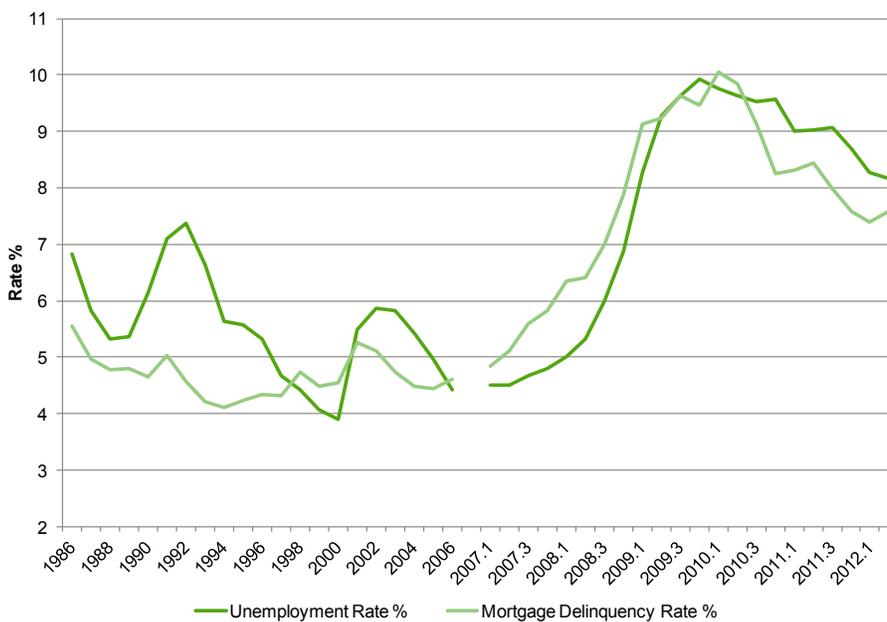
Source: Mortgage Bankers Association and Bureau of Labor Statistics

Home prices have begun to stabilize, after falling approximately 17% from their peak in late 2006 through the second quarter of 2012.   In the second quarter, home prices increased by 3% over the previous year, according to the Federal Housing Finance Agency (FHFA) index which tracks properties with conforming mortgages placed with Fannie Mae and Freddie Mac. According to the S & P Case-Shiller composite repeat sale home price index of 20 major metropolitan markets, prices peaked in April 2006, and then declined by 33% to reach their low in January 2012. Over the last six months, the index has edged up by 3.5%.

Foreclosure rates have begun to ease as the economy has shown signs of strengthening and the home price free fall ended; meanwhile the pipeline of severely distressed property has worked through foreclosure. According to the Mortgage Bankers Association (MBA), the percentage of mortgages in the process of foreclosure has hovered around 7.5% over the past three quarters after reaching a peak of more than 10% during the first quarter of 2010.

Along with the stabilization of home prices and foreclosure rates, the for-sale inventory of homes has declined substantially over the past year. According to the National Association of Realtors, the months' supply of existing homes for sale (at the current sales rate) reached 6.4 months during July 2012, down from 9.3 months one year earlier. Lower inventories have also allowed new-home construction to finally break from moribund levels. Single-family housing starts reached a 518,000-unit annual rate during the second quarter of 2012, up from a 422,000-unit annual rate one year earlier. (Exhibit 3)

Exhibit 3 – Single and Multi-housing Housing Starts (000s, SAAR)
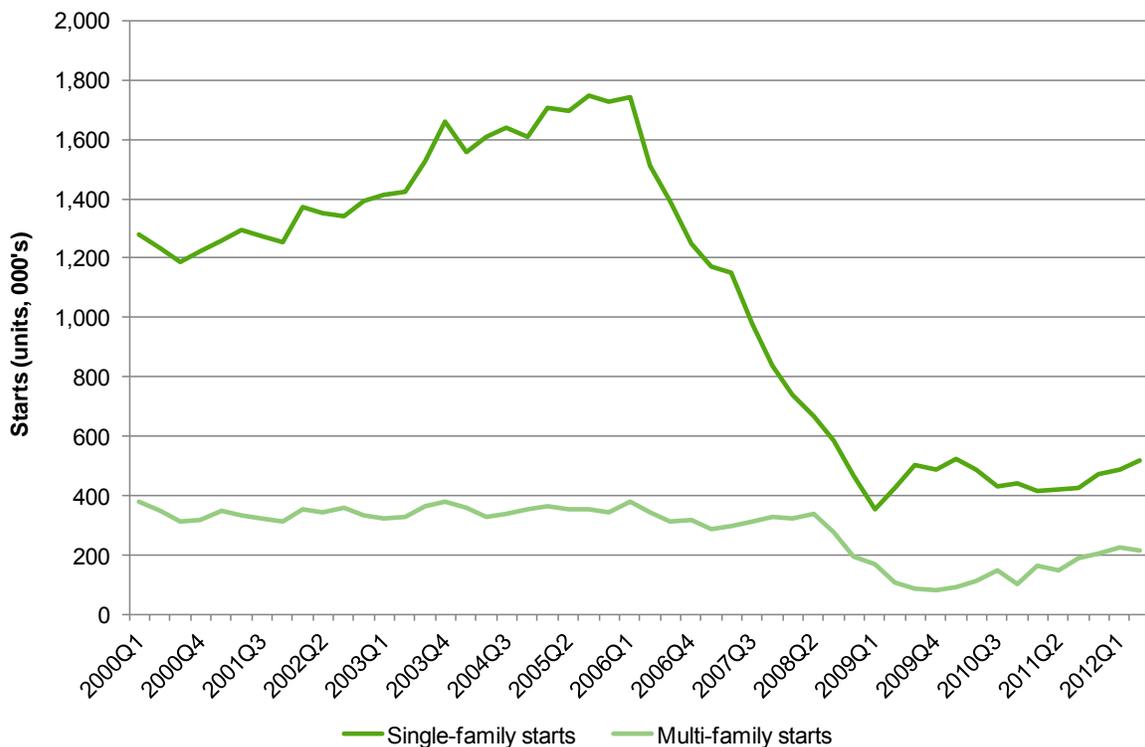
Source: Bureau of Census

The recent distress has highlighted the linkages between the performance of single-family owner market and the rental market. Distress in the single-family market due to high foreclosures has helped accelerate the recovery in rental demand. The US homeownership rate peaked at 69.2% in late 2004 and then began to decline after 2006. By the second quarter of 2012, the homeownership rate reached 65.5%, the lowest rate since the late 1990s. (Exhibit 4)

With additional foreclosures likely to take place over the next few years, it appears that there will continue to be downward pressure on overall homeownership rates. Despite the dramatic increase in housing affordability, mortgage lending remains fairly restrictive, with requirements of higher down payments and more selective credit underwriting criteria. Furthermore, weak consumer confidence and concerns over the strength of economic expansion and job security will continue to weight negatively on home purchases.

Exhibit 4 – Rental Households and the Homeownership Rate

Households, x 1,000   Homeownership Rate, %

Rental Households (000s)   Homeownership Rate % (right)
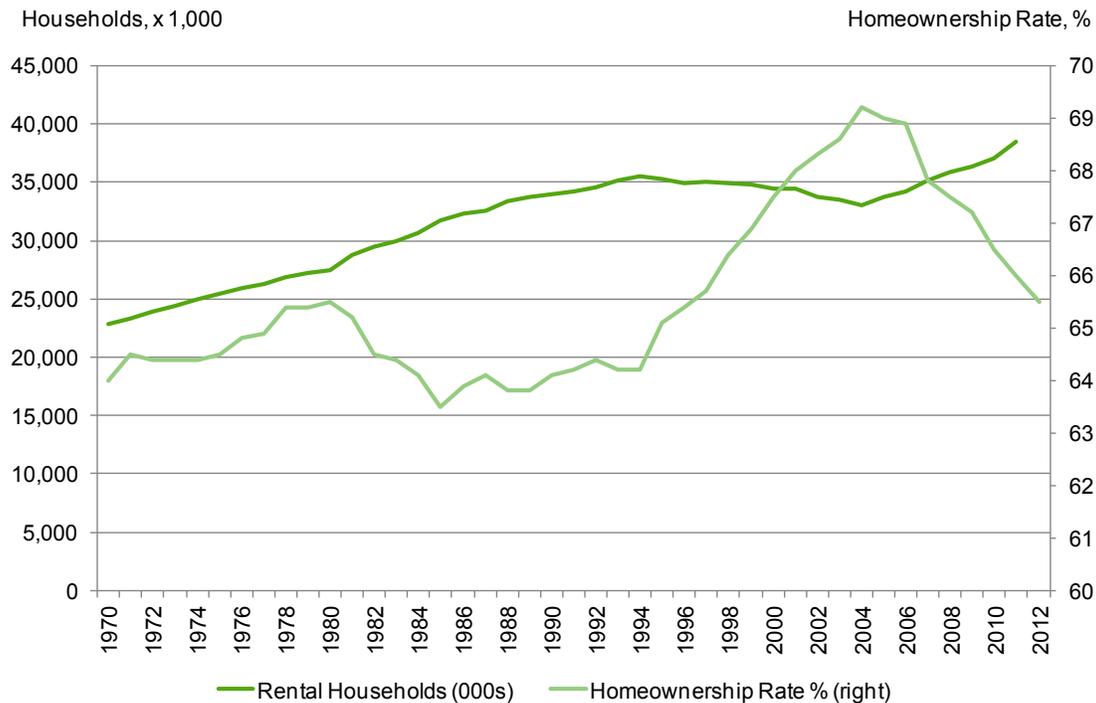
Source: Bureau of Census

Since 2006, the number of rental households has increased dramatically, according to the Bureau of Census. Between 2006 and 2011, the ranks of rental households swelled by an estimated 4.2 million, or 12%. This increase in the pool of renters has had a strong impact on the rental apartment market. Apartment vacancies have fallen sharply over the past two years. According to the CBRE- EA survey, the national apartment vacancy rate fell to 4.8% during 2012Q2. The rate was down 60 basis points from a year earlier and 50 basis points below the 1994-2011 average rate. According to the Bureau of Census, the rental vacancy rate follows a similar profile. The Bureau's survey indicates that the rental vacancy rate reached the peak of 11.1% during the third quarter of 2009, falling to 8.6% as of the second quarter of 2012. This survey is a broader measure of rental vacancy, which includes sources from apartments, small multi-housing properties, and single-family rental properties.

With the increase in occupancies, rents have been on the rise. CBRE-EA's index of effective apartment rents escalated by 5% for the year ended in the second quarter of 2012. Rent levels in most major metropolitan markets are now above their pre-recession peaks and are expanding. A key factor supporting the expansion of rents is limited growth in new multi-housing development to date.

While it is expected that new building completions will increase in the near-term, it appears that, given strong rental demand, there is the potential for the multi-housing rental market to remain fairly balanced over the next few years. Nationally, multi-housing (5+ units) permits increased to an annualized pace of 249,000 in 2012Q2 from 232,000 units in the previous quarter; starts declined to 207,000 from 216,000 units; and completions increased to 141,000 from 137,000 units.

Permits, starts, and completions remain below their 1989 – 2008 respective averages of 301,000; 265,000; and 253,000. Deliveries are on track to surpass 200,000 units by late 2012 – early 2013 – up from the annual pace of about 130,000 units in 2011. In addition, own-to-rent conversions of distressed single-family and condominium properties could meet the supply for rental housing in a number of key markets that have been severely affected by the housing recession.

Indeed, the impact of rental conversions of homeownership housing on rental supply is likely to be more focused on areas that have significant single-family home price declines and above-average foreclosure rates. In particular states such as Arizona, California, Nevada, and Florida have suffered disproportionately from the nation's single-family housing downturn. Several metropolitan areas within these states tend to have both high owner and rental vacancy rates, suggesting that the prospect of improved home price and rental appreciation may be delayed over an extended period in these areas.

Improving property operating performance in the apartment market has contributed to a remarkable recovery in property values. Home prices and the value of multi-housing rental properties largely tracked one another during the first half of the 2000s. As Exhibit 5 shows, sales prices of apartments then appreciated fairly dramatically in 2006 and 2007 during the peak years of the housing market boom, according to Moody's – Real Capital Analytics (RCA) repeat sales apartment price index. Home prices began a steady downward march in late 2007 which was shortly followed by apartment prices, which plunged as liquidity dried up and bank lending channels froze in late 2008. Apartment values bottomed out in the fourth quarter of 2009 after a dramatic 38% percent drop from their peak. Since that time frame, there has been a divergence of home sale and apartment sales price trends.

Exhibit 5 – Moody's – RCA Apartment Price Index and FHFA Home Price Index
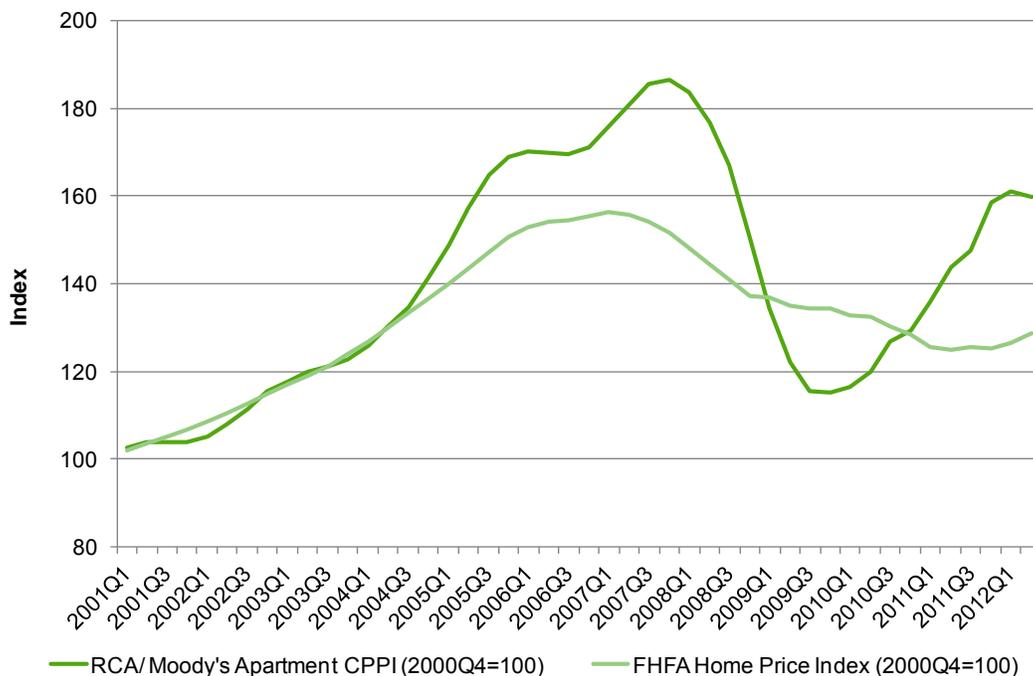
Source: Moody's, Real Capital Analytics and FHFA

According to the RCA index, apartment values have increased over the past two and one-half years by approximately 38%. In contrast, home prices have continued to fall over most of this time frame reflecting the negative impact of rising distressed property sales on overall prices. Available for-sale home inventories have begun to improve substantially during 2012 allowing for prices to finally increase on a quarterly basis during 2012 Q2. (Exhibit 5)

The relationship between home prices and rents has shifted dramatically over the past decade. Exhibit 6 shows a longer-term relationship between the FHFA home price index and the Consumer Price Index (CPI) for rent. At the peak of the housing market the ratio of the home price index to rents exceeded 1.6 times. With the deflation in home prices, the ratio to rents has fallen dramatically since 2006, bringing the home price to rent balance back to levels last witnessed in the mid-1990s. This would suggest that home buying relative to renting is relatively affordable when compared to the experience of the last two decades. However, while low home prices provided strong incentive for buyers to enter into the market, there are significant constraints to home buying due to stricter underwriting of mortgage loans and more stringent credit requirements.

Exhibit 6 – Home Prices Relative to Rents
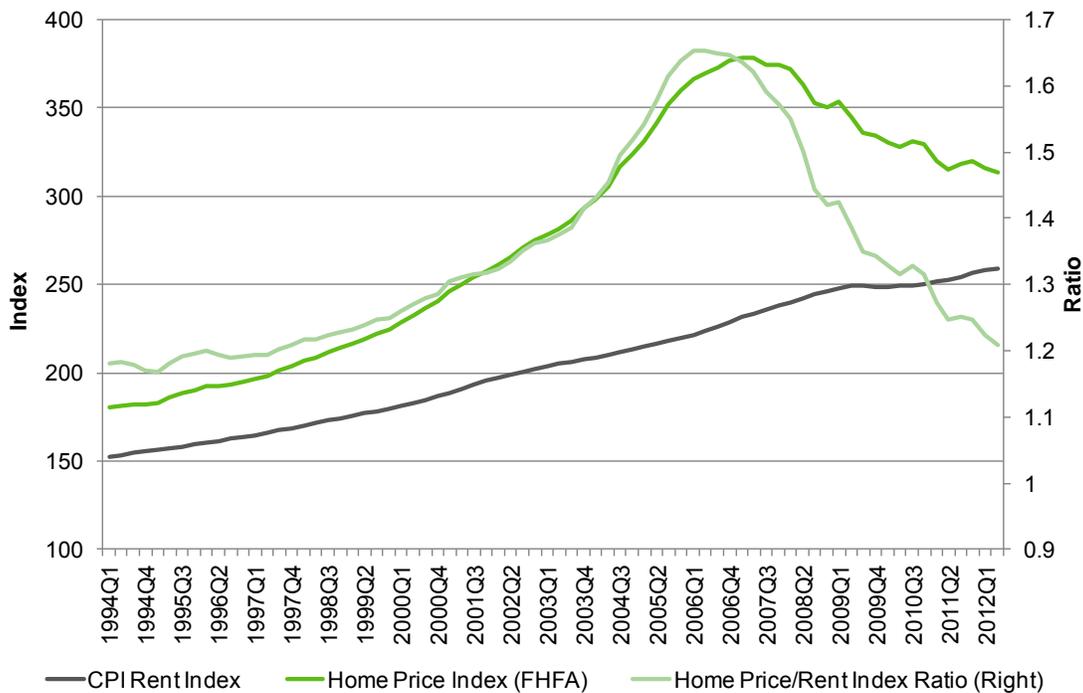
Source: FHFA and Bureau of Labor Statistics

The apartment sales transaction market remains strong as of mid-2012. Real Capital Analytics tracked over $17 billion in closed sales transactions during 2012 Q2, an increase of 21% over year earlier levels. As a variety of investors were attracted to the multi-housing apartment market, investment volume has picked up substantially. After reaching a low of $17 billion during 2009, sales surged to over $56 billion in 2011.

The strength of the multi-housing investment market is also seen in the steady decline in the capitalization rate, or the ratio of net operating income to property sales value, after the financial crisis began to wane. During the second quarter of 2012, RCA reported that the average apartment transaction capitalization rate reached 6.13%, down nearly 100 basis points from its peak registered during mid-2009. At this level, capitalization rates are approaching their pre-crisis low of 5.8%. (Exhibit 7)

The dramatic improvement in multi-housing occupancies and rents has fueled a sharp turnaround in the demand for investment property among investors. The growth in multi-housing sales has been financed through a variety of sources, including life companies, banks, agency lenders, and CMBS lenders. Despite these seemingly broad gains in apartment investment activity, the recovery has initially been focused on a handful of high occupancy markets that tend to be traditionally favored by institutional investors.

In addition to Real Estate Investment Trusts (REITs) and institutional investors, private investors have fueled demand for properties especially in larger supply-constrained coastal metropolitan areas. The improvement in the investment market is a sign that development activity is likely to be pursued in anticipation of higher investment yields. While investment and development activity appears most promising at this point for higher–rent, market rate properties, demand for tax credits for affordable housing development issued through the Low Income Housing Tax Credit (LIHTC) program has also improved over the past two years.[1]

Exhibit 7 – Apartment Sales Volume and Average Capitalization Rate
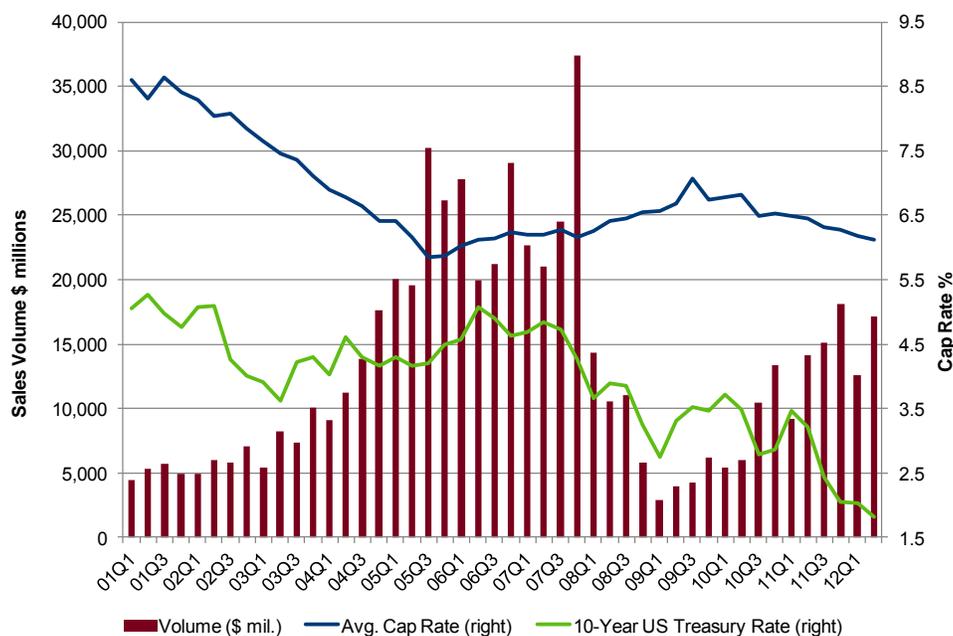
Sources: Real Capital Analytics, Federal Reserve

The fundamentals that drive rental housing performance are expected to remain solid over the next few years. Demographic shifts, particularly growth in the 20 – 34-year-old age group, will help support growth in rental demand. However, the negative effects of sluggish employment growth on rental household formation, combined with the possibility of increased owner-to-renter conversions, may produce a dynamic which slows rental appreciation and occupancy growth from very strong levels.

Nonetheless, investor interest in the multi-housing sector remains strongest among commercial property types, a reflection of improving operating fundamentals and strong investment liquidity. Reflecting these favorable trends, the credit worthiness of multi-housing lending is expected to remain healthy over the next few years. Historically, investors have prized the multi-housing sector for its favorable operating performance and its relatively limited cash flow volatility. As a result, most lenders who have underwritten loans prudently have benefited from strong credit performance. In particular, banks, life companies and the agencies have witnessed generally low mortgage default rates on apartment properties over the past two decades.

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[1] See Berton, Brad, "Affordable Housing Demand", Urban Land, April 2011. Available at http://urbanland.uli.org/Articles/2011/Mar/BertonAffordable, and Bergsman, Steve, "Investors pay premium for affordable housing tax credits", Inman News, October 12, 2012. Available at http://www.inman.com/buyers-sellers/columnists/sbergsmancoxnet/investors-pay-premium-affordable-housing-tax-credits.

In addition to job growth, the interaction between the expanding rental market and the recovery in the housing market will be a major factor in driving apartment performance. Home price trends will be an important factor, since apartment occupancy is now above the historical norm in many markets and has less room for increases going forward.   In general, improving prices in the home ownership market are likely to benefit apartment rental performance. A struggling housing market is likely to only benefit the apartment sector, as it has during the past two years, for a limited time.   Additional declines in home prices could bring more foreclosures and higher own-to-rent conversions. This could lead to higher overall rental vacancy rates, even with larger numbers of rental households.

The multi-housing market is well positioned to take advantage of growing housing needs from displaced former single-family homeowners as well as new entrants into the workforce, and the growing housing needs of the aging population. One concern, however, is that rent escalation amid a weak labor market and slow income growth will worsen affordability, especially for lower income renters. A well-functioning multi-housing capital market, one which provides liquidity across multiple segments of the multi-housing sector, will remain an important element in providing housing needs across broad income segments of the population.

Housing Demand

Overview

Rental housing demand is highly influenced by employment growth and the interplay between the owner and rental markets in terms of pricing and available supply. Demographics also have an important role in shaping longer-term trends in homeownership and rental demand. Homeownership tends to rise as workers reach their middle years and their earnings increase; they generally remain homeowners in later working years and as they reach retirement. The recent stress in the owner market has brought on a flurry of foreclosures, which in turn, has increased available rental supply and reduced the homeownership rate.

An important question is whether the homeownership rate continues to decline or stabilizes at current levels. Indeed, there remain significant headwinds toward homeownership: reduced availability of credit and a shrinking pool of potential buyers that qualify for mortgage financing; and buyers' perceptions and concerns as to whether owner housing will appreciate, providing longer-term wealth creation opportunities.   At the same time, the affordability of single-family homeownership relative to renting has increased to its highest level since the early 1990s.   This section will take a brief overview of the major components of rental housing demand: which types of structures house renters, an overview of rental demographics, and issues related to the affordability of rental housing.

Rental Housing Demand and Structure Type

The demand for rental units spans a variety of single– and multi-family structures. Exhibit 9 shows the distribution of renter occupied units by structure type and by year structure built. As one would expect, larger apartment buildings tend to account for a higher share of renter households. For instance, the share of units in buildings with three or more apartments that are occupied by renters exceeds 85%. In contrast, owner-occupied units account for 82% of single-family detached units.

However, it is interesting to note that single-family and two family buildings account for a remarkably high share of total renter households – over 41% of renters live in these types of buildings. Not all renter households are congregated in larger apartment buildings. The single family segment of the market is particularly critical in examining the dynamics of homeownership versus renting in today's market. With the rise of foreclosures, a large number of owner-occupied single-family homes and condominiums are being converted to rental housing.

Exhibit 8 – Apartment Demand Follows Employment Closely
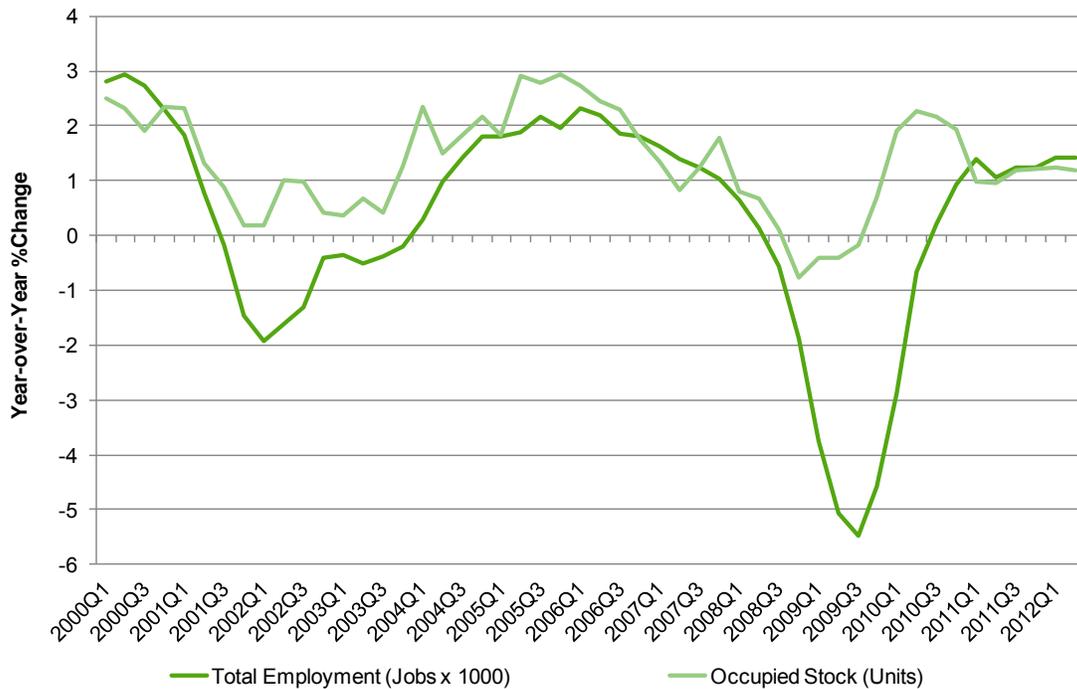
Sources: Real Capital Analytics, Federal Reserve

While it is likely that single-family buildings can provide rental housing to a certain segment of the market – particularly middle-aged homeowners who have been foreclosed, and others that cannot meet credit requirements to purchase housing – conversions essentially provide a critical "escape valve" to satisfy rental demands related to falling home ownership rates.[2] Indeed, owner to rental conversions have played an important role in shifting the distribution of renter occupied stock during the housing crisis. In 2010, single-family rentals accounted for 33.5% of the total renter occupied stock, up from 30.8% in 2005.[3]

In addition, a higher than average share of occupied rental units is located in older buildings. This reflects the fact that a large share of units was constructed for the single-family owner market over the past two decades, while renter occupied share of construction remained relatively modest. Furthermore, a large share of rental demand is focused on established cities that generally have an older housing stock.[4] More than 31% of owner-occupied units were built in 1990 or later; by comparison only 24.5% of renter occupied units have been built within this timeframe. In addition, 61% of rental units were constructed before 1979, above the 55% share for the owner market. Compared to the owner market, the rental market provides additional demands for upgrading and rehabilitating space, as well as new newer, more functional construction.

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[2]The following section on rental supply includes a discussion of the important role that conversions play in regulating the supply and demand balance between the owner and rental market.

[3]See "Single-family Rental Housing – The Fastest Growing Component of the Rental Market", Fannie Mae Economic and Strategic Research Data Note, March 16, 2012, at http://www.fanniemae.com/resources/file/research/datanotes/pdf/data-note-0312.pdf.   The study found that single-family renters tend to be more "middle-aged" than other renters, have larger than average household sizes, and a rent burden similar to other renters.

[4]For instance, according to the 2011 American Community Survey, the twenty largest metropolitan areas account for 37.5% of the nation's population, but also account for 40.8% of occupied rental housing units. Furthermore, 35.6% of these units in the largest metropolitan areas were constructed prior to 1960, compared with a 31.2% figure for the nation.

Exhibit 9 – Distribution of Owner and Renter Occupied Units

	Owner Occupied	Renter Occupied	Renter Share of Units by Category
Occupied Housing Units	74,873,372	39,694,047	26.5%
UNITS IN STRUCTURE			
1, detached	82.0%	27.4%	15.0%
1, attached	5.9%	6.1%	35.4%
2 apartments	1.3%	8.1%	76.8%
3 or 4 apartments	0.9%	10.6%	86.2%
5 to 9 apartments	0.8%	11.8%	88.7%
10 or more apartments	2.4%	31.2%	87.3%
Mobile home or other type of housing	6.8%	4.7%	26.8%
YEAR STRUCTURE BUILT			
2000 or later	15.9%	12.7%	29.7%
1990 to 1999	15.4%	11.8%	28.9%
1980 to 1989	13.7%	14.3%	35.6%
1960 to 1979	25.9%	29.7%	37.8%
1940 to 1959	17.0%	16.2%	33.6%
1939 or earlier	12.1%	15.3%	40.1%

Source: Bureau of Census, 2010 American Community Survey

Rental Housing Demand and Demographics

Labor market conditions are critical in determining changes and shifts in both owner and rental housing demand. However, changes in the labor market must also be viewed in the context of broader demographic changes, including population growth and household formation.

Over the past decade, the key factors that support housing demand have fallen flat relative to the performance in previous decades. Between 2000 and 2010, actual levels of employment fell, reflecting the impact of the "Great Recession". This restrained the overall household formation rate, as workers were forced to "double up" and postpone housing decisions in response to the very weak economic conditions. As a result, the household formation rate averaged only 1% per year during this decade, well below averages during the previous two decades and less than half of the rate recorded during the 1970s - as the "Baby Boom" generation entered the labor force and started forming new households in large numbers. (Exhibit 10)

Exhibit 10 – Key Drivers of Housing Demand

Key Drivers of Housing Demand

Sources: Bureau of the Census, Bureau of Labor Statistics, CBRE Econometric Advisors
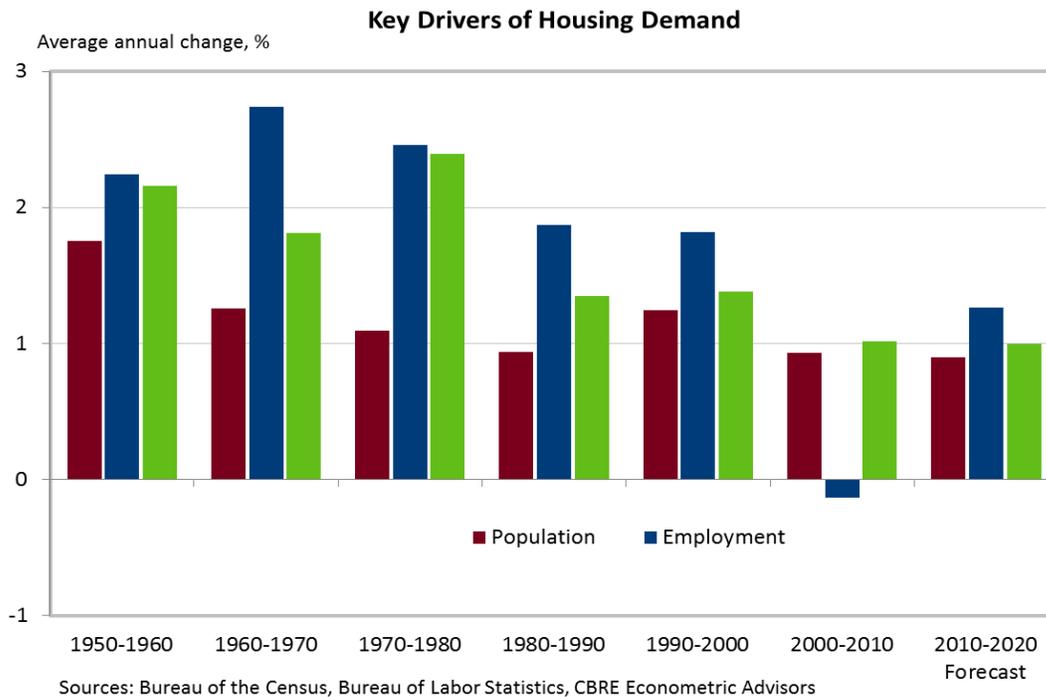
In addition, household formations during the past decade have been slowed by generally lower levels of immigration, which paralleled reduced overall population growth. These trends overshadowed other more fundamental shifts in the population age distribution.

Over the past decade, growth in the number of persons age 55 and older accelerated, reflecting the aging of the "Baby Boom" generation. Furthermore, their children – the "Echo Boom" -- reached working age in greater numbers. The spending and lifestyle patterns of these two age groups began to dominate consumer and housing markets. Over the next 10 years, these trends are expected to accelerate as the number of persons aged 65 and older are expected to increase by over 14 million, while those aged 15 to 34 will increase by over 4 million. (Exhibit 11) The changes portend slower overall growth in the labor force, as waves of older workers reach retirement age. Taking into account the changes in demographics, and potential growth in the economy, overall household formation rates over the next decade are expected to roughly match the average growth rate over the past decade.[5]

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[5] CBRE-EA has produced an outlook for the next 10 years – population is forecast to grow by 0.9% per year, while employment will expand by 1.2% per year. This is consistent with the household formation rate of 1% per year. Population and household formation rates are slightly lower, but consistent with performance over the past decade. However, the expected performance will be slower than what was witnessed during the 1990s, when population, employment, and households expanded at annual rates of 1.24%, 1.82%, and 1.38%.

Exhibit 11 – Population by Age (Levels)

Population (millions)
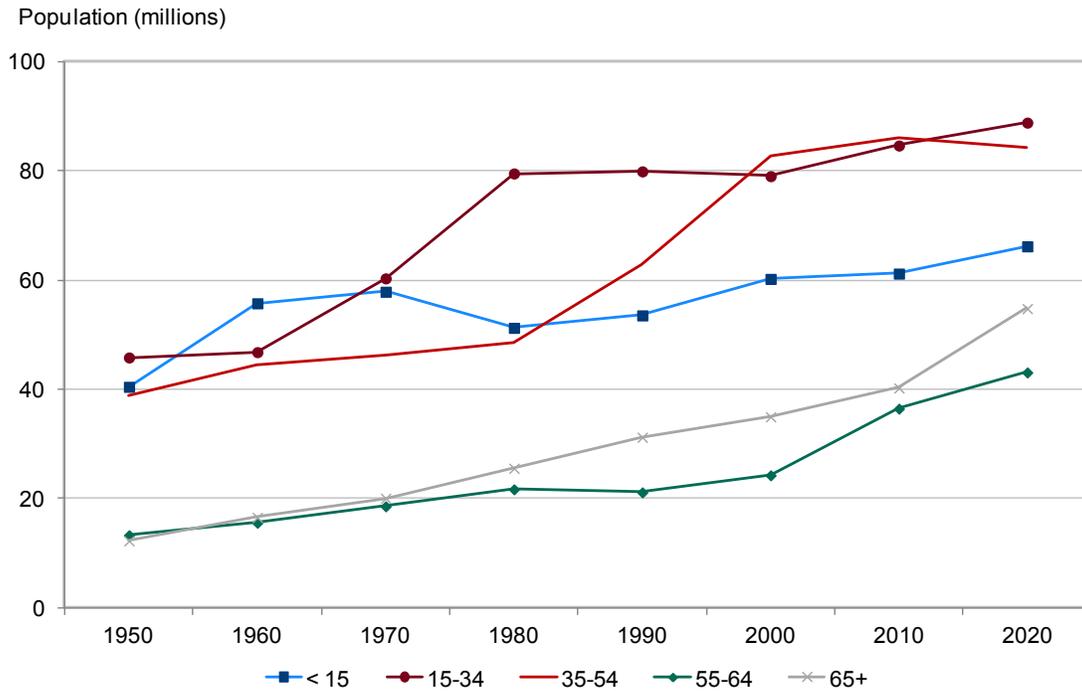
Sources: Bureau of Census, Bureau of Labor Statistics, CBRE-EA

Rental demand is influenced by the age demographics of the labor force as well as longer-term shifts in homeownership. As the last few years have demonstrated, shifts in the homeownership rate can be fairly dramatic and have a pronounced impact on overall rental demand. However, there is a much longer-term impact due to a general "life-cycle" trend of renting versus owning that occurs as households grow earnings over time change tenure to the homeowner market. The current homeownership rate for households headed by persons aged 25 to 29 is slightly more than 30%, about half of the 65.5% average over all households that was registered as of 2012Q2.

As Exhibit 12 shows, homeownership rates are upwardly sloping with age; they generally stabilize as households reached their mid-50s, and then they decline slightly as households reach retirement age. Older households may tend to downsize their housing needs into rentals or senior living facilities. Exhibit 12 also shows the extent to which the homeownership rate curve has shifted downward from its peak level recorded in 2004. Homeownership has declined across all household ages, except for those aged 65; these households have maintained their homeownership rates in the face of deteriorating housing market conditions. Since these households tend to carry lower mortgage balances, or own their homes free and clear, they have been less affected by the downturn in the housing market and are less likely to default on their mortgages.

Exhibit 12 – Homeownership Rates by Age Category
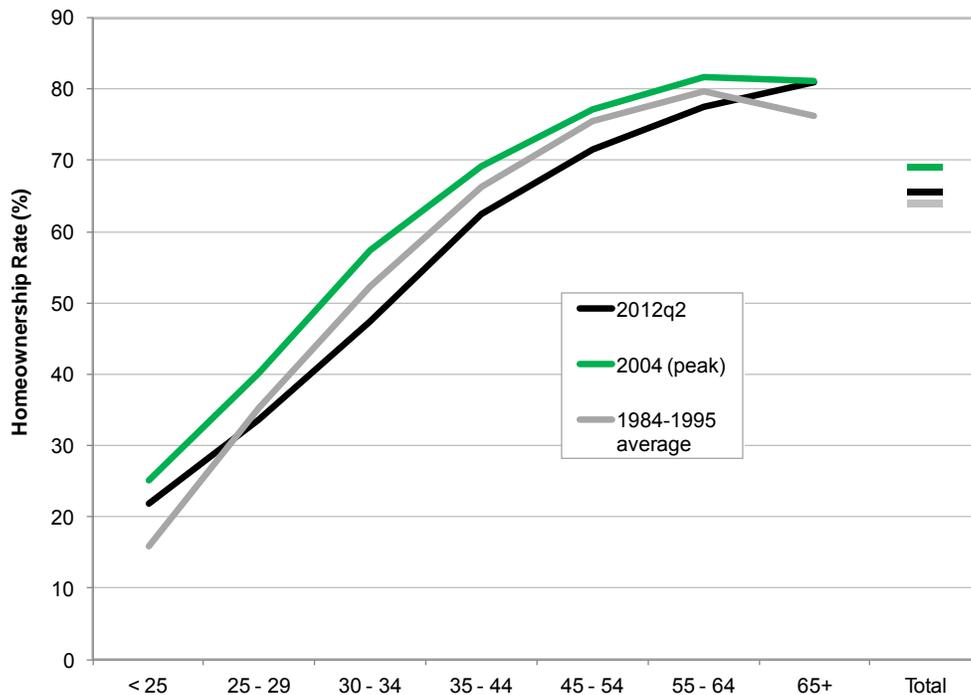
Source: Bureau of Census, CBRE-EA

In general, demographic trends are expected to support rental demand over the near-term. This will reflect growth in the population, especially among those aged 25 to 34, which tend to have a much higher propensity to rent than the older population. In addition, rental demand will be supported by the sheer size of the growth in population aged 65+.

While older households tend to have much higher than average homeownership rates, these rates stabilize or tend to drift lower over time, rather than increase as the case with middle-aged households. To demonstrate the impact of demographic changes, CBRE–EA developed possible scenarios for rental demand growth over the next five years. Exhibit 13 shows CBRE-EA's analysis for two potential scenarios for growth in total rental households, assuming an overall household formation rate of roughly 1.3 million per year through 2016.

The first scenario assumes that current age – specific homeownership rates remain constant over the next five years, while the second assumes that current age – specific homeownership rates return to their historical average. In both cases, households aged 65 and over contribute disproportionately to the growth in renter household demand, followed by those 35 years or younger.

If homeownership rates continue to decline, approximately 38% of the increase in total households will be renters. Furthermore, developers have tended to focus on the rental needs of the younger population in the past. However, the growing need for seniors housing will become quite apparent as the current decade unfolds. If homeownership moves toward historical averages among those aged 65+, more than one-half of total rental demand will come from this age group.[6]

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[6] See Nechayev, Gleb, "Unlocking Pent-Up Rental Demand Among Seniors" CBRE-EA About Real Estate, October 15, 2012.

Exhibit 13 – Age Demographics Favor Multi-Housing, 2011-2016 Average Annual Growth

	Total Households	Renter Households	
Age		Scenario A	Scenario B
< 35	245	145	160
35-64	240	60	70
65+	815	185	260
Total	1,300	390	490
Scenario A assumes current age-specific homeownership rates		
Scenario B assumes age-specific homeownership rates revert to historical norms.		

Sources: Bureau of Census, CBRE-EA

Renter Income Characteristics

The income profile of renters is closely related to their age demographics. Since renters tend to be younger, they also tend to have fewer financial resources when compared to homeowners. According to the Harvard Joint Center for Housing Studies, over 30 million homeowners have incomes of $75,000 or more, accounting for more than 41% of total homeowners. In contrast, a much smaller share of high-income households are renters – only 5 1/2 million renters - have household incomes in excess of $75,000. These higher income, so-called "renters by choice", account for only 13.8% of all renters.   The majority of renters tend to have lower incomes – in 2010, over 19 million, or 49% had household incomes under $30,000. By comparison, only 20.5% of homeowners reported household incomes below this level.[7]   (Exhibit 14)

Exhibit 14 – Tenure by Income of Householder, 2010

	Renters		Owners	
Household Income	Number	Percent	Number	Percent
Under $15,000	9.9	25.0%	5.6	7.4%
$15,000–29,999	9.5	24.0%	9.8	13.1%
$30,000–44,999	7.1	18.0%	10.5	14.0%
$45,000–74,999	7.6	19.2%	18.3	24.4%
$75,000 and Over	5.5	13.8%	30.8	41.1%

Source: Harvard Joint Center for Housing Studies

In addition, the income distribution of renters has shifted over the long-term, becoming more skewed to the lower end of the income distribution. According to the US Department of Housing and Urban Development (HUD), over 48% of renters were classified as either very low income (reporting incomes less than 30% of area median family income), or low income (reporting incomes between 30% and 50% of area median family income) in 2009. Since 1991, the number of renters in these two categories has increased by close to 3 million, or 20%. (Exhibit 15)

Meanwhile, the share of renters with moderate to high incomes has fallen dramatically. Renters with family incomes 80% or greater than median family income fell by more than 8 million, or 42%, between 1991 and 2009. This resulted in a drop in the share of higher income renter households from over 36% to below 32%.

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[7] See Harvard Joint Center for Housing Studies, "The State of the Nation's Housing 2012", 2012. Available at
http://www.jchs.harvard.edu/research/state_nations_housing.

The decline in higher income renters reflects the transition of these renters into homeownership over the period. The combination of low down payments and affordable mortgage products, created scores of first-time homebuyers. However, as new data come to light, it is likely that we will see another shift in the rental income distribution. Rising foreclosures over the past two years are likely to shift a large number of middle-income, former homeowners back into the rental housing market. In addition, more stringent mortgage underwriting criteria, and higher down payment requirements are likely to prevent a siphoning off of middle income renters into the homebuyer market, as witnessed in the past.

Exhibit 15 – Income Distribution of Renters, 1991 and 2009

	1991		2009		Change	
Income Range	**Total**	**%**	**Total**	**%**	**Total**	**%**
(% of Area Median Family Income)	**(000s)**	**Share**	**(000s)**	**Share**	**(000s)**	
< 30%	8,392	25.2	9,961	28.1	1,569	18.7
30-50%	5,770	17.3	7,157	20.2	1,387	24.0
50-80%	6,933	20.8	7,168	20.3	235	3.4
>80%	19,189	36.7	11,110	31.4	(8,079)	-42.1
Total	33,351		35,396		2,045	6.1

Sources: HUD 2007, "Affordable Housing Needs 2005", Report to Congress,
and HUD 2011, "Worst-Case Housing Needs 2009", Report to Congress

Rental Housing Affordability Issues

In recent decades, the rental housing market has been characterized by declining affordability – for the overall market, and in particular, among lower income households. While moderate and higher income households have benefited from rising levels of affordability in the homeowner market, lower income renters have faced the prospect of steadily rising housing costs amid stagnant or declining incomes.

Maintaining or expanding sufficient affordable housing across a variety of income groups has proven challenging in recent years. In this section, we will briefly examine the overall trend in rental housing costs and their effect on rental affordability. This will also be compared against growth in various assistance and lower income housing programs that have been enacted by federal and state housing policymakers to help mitigate affordability issues.

Over the longer term, general rental housing cost inflation has exceeded the overall growth in consumer prices, highlighting a long-term general trend in declining rental affordability.[8] Since 1982, the annual growth in the rental component of the Consumer Price Index (CPI), has averaged close to 3.6%, above the 3.1% average for overall consumer price inflation.[9] According to the American Housing Survey, median monthly rental housing costs registered a cumulative increase of 39% between 1999 and 2009, above a comparable 35% percent increase in overall consumer price inflation.

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[8] For perspective on the long-term declining trend in rental housing affordability, see Harvard Joint Center for Housing Studies, "Rental Market Stresses; Impacts of the Great Recession on Affordability and Multi-housing Lending", July 2011. Figure 2.4 shows a number of measures that indicate long-term declines in rental affordability since 1960, including the median rent to income ratio, and the share of renters paying more than 30% of income for rent.
[9] Source: Bureau of Labor Statistics and Moody's economy.com, CBRE calculations. Rental price inflation has a varied relative to overall price inflation over time, reflecting supply and demand conditions in the rental market. Since 2008, average rental inflation has roughly matched overall price inflation. During the 2000's and the 1980s, rental prices exceeded consumer prices by a fairly wide margin; during the 1990s rent and overall price inflation was fairly closely matched.

When these statistics are viewed against growth in incomes, or the share of income that is devoted to housing costs, the resulting trends in rental housing affordability over the last decade are discouraging. According to the survey, median renter household incomes increased by just 14% over this period.   As a result, the median percentage of current income that rental households devote to housing costs increased from 27% to 31%.[10]   While indeed a large share of higher income renter households switched tenure over this period, leaving a smaller pool of generally lower income residents in the rental market, the growing gap between rents and income levels was significant.

Exhibit 16 – Rental Housing Inflation vs. Overall Inflation
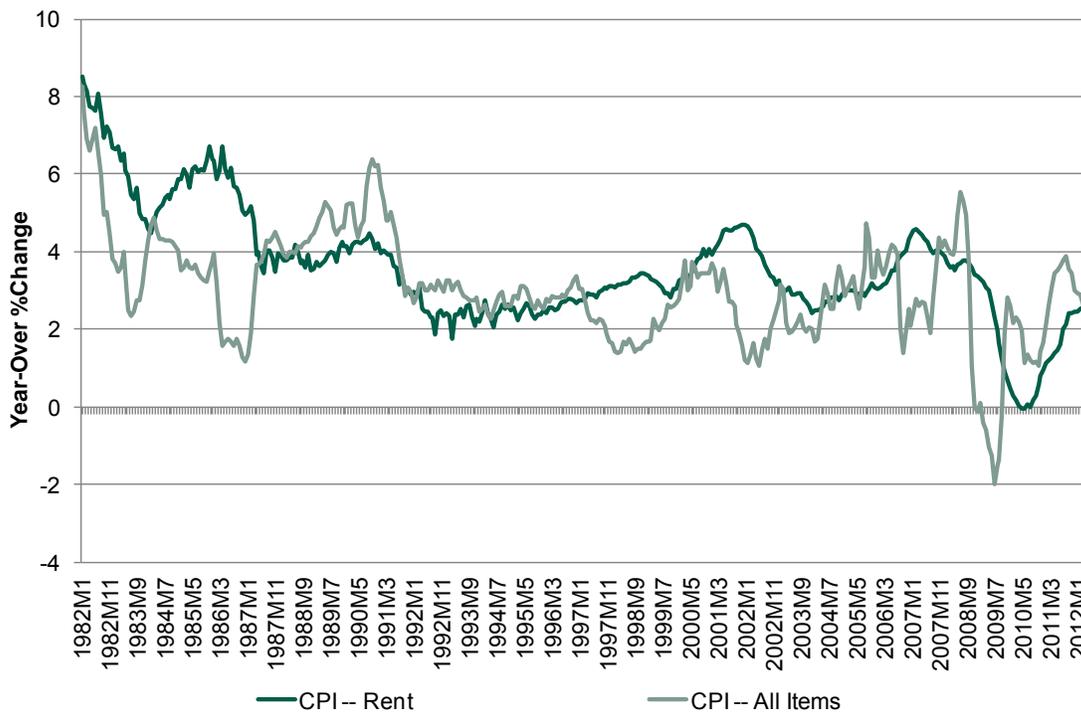
Sources: Bureau of Labor Statistics and CBRE Research Calculations

The "Great Recession" played a critical role in increasing rental cost burdens, as rental household incomes continued to fail to keep up with rent inflation. The percentage of households paying at least 30% or more of their income for housing reached 53% in 2010 up from 49.3% in 2007. Meanwhile, housing cost burdens for owner occupants remained relatively stable over this period. Between 2008 and 2010, growth in median gross rent continued to outpace median rental household income, contributing to an additional decline in affordability.   There are indications that rent burdens have increased for younger and middle-aged households across all housing structure types, including the single-family rental segment.[11]

There has been a substantial rise in the percentage of renters that face housing problems, most notably in terms of excessive rent burdens. In HUD's most recent report to Congress on the nation's housing needs, the number of households facing housing problems -- without some form of housing assistance -- increased by 24% between 1999 and 2009.

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[10] Source: Bureau of Census, American Housing Survey, various years. Available at http://www.census.gov/housing/ahs/data/national.html.   According to the survey, median renter household income increased from $24,772 in 1999 to $28,400 in 2009.   Over the same time period, median monthly rental housing costs increased from $580 to $808.
[11] See Duncan, Douglas, "As Renter Incomes Stall, Rental Affordability Problems Mount", Fannie Mae Commentary, May 7, 2012. Available at http://www.fanniemae.com/portal/about-us/media/commentary/050712-duncan.html.   The updated data on rents and affordability is compiled from the Census Bureau's American Community Survey.

While the percentage of rental households facing inadequate or crowded housing declined over this period, the share that face a very high rent burden – devoting more than 50% of income toward housing costs – increased from 19% to 25%. In addition, there was an increase in the share of renters that faced moderate rent burdens, defined as renters whose housing costs consumed 30% to 50% of income. In addition to rising rents and declining incomes, the growth and housing problems appears to be compounded by a decline in the number of assisted households, which fell by 23% over this period, from 6.2 to 4.8 million. (Exhibit 17)

Exhibit 17 – Household Tenure and Renter Problems, 1999-2009

	1999	2009	% Change
Households (millions)			
Total Households	102.8	111.8	9%
Owner Households	68.8	76.4	11%
Renter Households	34	35.4	4%
Assisted	6.2	4.8	-23%
Unassisted with Problems	13.1	16.3	24%
Unassisted no Problems	14.7	14.2	-3%
Percent of renters with housing problems			
Rent burden > 50% of income	19%	25%	6%
Rent burden 30-50% of income	21%	23%	2%
Severely inadequate housing	4%	3%	-1%
Moderately inadequate housing	8%	6%	-2%
Crowded housing	5%	4%	-1%

Source: HUD, Worst Case Housing Needs 2009: Report to Congress

A portion of the increase in overall housing burdens can be attributed to a shortage in the number of public and private low-cost rental units available. According to analysis by the Joint Center for Housing Studies, there is a substantial and growing supply gap for affordable rental housing. (Exhibit 18) The number of low income households now stands at 10.3 million (as of 2010), up from 8.1 million in 2001, while the stock of affordable units has shrunk from 5.7 million to 5.23 million.

The decline in affordable stock has taken place across private and public – sponsored housing. The HUD project assisted stock, which now numbers some 3.1 million units, has been dwindling since the 1990s. More than 700,000 units were lost between 1995 and 2009, due to either physical deterioration or conversion to higher market rents as subsidy contracts expired. The report also noted that the private low-cost rental stock is has been disappearing. Of the units renting below $400 in 1999, close to 12% were demolished by 2009. Furthermore, it appears that the filtering of higher rent units to lower rent units over time has been insufficient to increase the supply of affordable units: for every two units that moved down to lower cost categories between 1999 and 2009, three moved into higher rent categories.[12]

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[12] See "Shrinking Supply of Low-Cost Rentals" in Harvard Joint Center for Housing Studies, "The State of the Nation's Housing 2012", 2012. Available at http://www.jchs.harvard.edu/research/state_nations_housing.

Exhibit 18 -- Growing Low Income Housing Needs Outpace Affordable Units
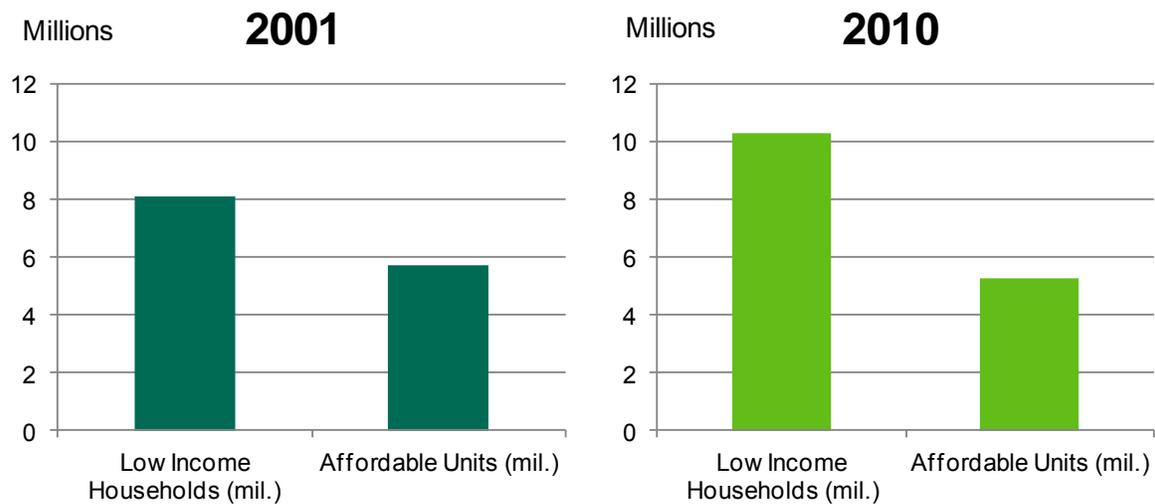
Source: Harvard Joint Center for Housing Studies

Housing assistance programs mitigate some of the affordability challenges, but these are limited to lower income segments of the renter population. Although Federal Section 8 housing voucher program provides rental assistance to low-income households to offset some housing burdens, landlords are under no obligation to accept vouchers or stay in the program and maintain rents at affordable levels. The voucher program is a form of housing assistance that does not directly add to the affordable housing inventories in place.   Moreover, number of vouchers has been relatively fixed since 2002. Over 1.5 million vouchers were issued as of 2009, a figure only marginally higher than at the beginning of the decade.[13]

Low-to-moderate income families are likely to be squeezed, as major tax credit assisted programs are limited to households with very low incomes. Eligibility for the Low Income Housing Tax Credit (LIHTC) program is capped at 60% of area median income adjusted for family size, while eligibility for the Section 8 voucher program is usually capped at 50% of area median family income. Households with incomes above 60% of area medians are excluded, despite rising cost burdens among these households.[14]

Housing cost burdens also vary substantially between urban and rural areas and also between metropolitan areas. CBRE's analysis of the 2011 American Community Survey Data indicates that over 45% of urban renter households pay 30% or more of their current income in gross rent utilities compared with slightly less than 39% of households in rural areas. Several factors are associated with higher rental housing cost burdens. While our analysis does not identify the specific factors that determine the lack of rental housing affordability by metropolitan area, there are a few broad generalizations that can be made.

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[13] Source: US Department of Housing and Urban Development, "Section 8 Tenant-based Housing Assistance: A Look Back After 30 years", 2000, available at http://www.hud user.org/publications/pdf/houseord.pdf; US Department of Housing and Urban Development, "Characteristics of HUD – Assisted Renters in their Units in 2003", 2009, available at http://www.huduser.org/publications/pub-asst/HUD_asst_rent.html, 2009; and L. Couch, "Housing Choice Vouchers", in the National Low Income Housing Coalition, "Advocates Guide to Housing and Community Development Policy", 2009, (pp. 46 – 49), National Low Income Housing Coalition, available at http://nlihc.org/doc/Advocacyguide 2009–web.pdf.
[14] Harvard Joint Center for Housing Studies, "The State of the Nation's Housing 2012", 2012. Available at http://www.jchs.harvard.edu/research/state_nations_housing, pp. 25.

There is a small positive correlation between rental housing burdens and metropolitan area size: for instance, the average share of rental households that devote more than 50% of income toward rent is 29% for the 15 largest metropolitan areas, and 27.8% for the next 35 largest metro areas. Larger, higher density metropolitan areas generally have lower housing affordability and therefore a larger share of burdened households. However, higher income areas tend to offset extreme housing burdens: there is a slight negative correlation between median renter household income and the share of renters with 50% plus rent burdens. Still, the relationship is fairly weak, and some higher income metropolitan areas indeed face above-average rent burdens. On the other hand, it is not surprising that there is a fairly high negative correlation between the share of a metropolitan area's rental stock that is devoted to affordable rental units and the share of households that have high rent burdens. [15]

Exhibit 19 shows the twenty-five highest-ranking metropolitan areas in terms of the share of highly-burdened renters – those who pay 50% or more of household income in rent.[16] The results show an interesting mix of both higher – and lower – income metropolitan areas.

In certain metropolitan areas, high incomes may not be enough to offset rent levels for certain segments of the population, resulting in a high share of extraordinarily burdened rental households. In these cases, high density or supply constraints may be contributing to above-average rental costs and therefore lower affordability. In addition, there are several metropolitan areas that appear to suffer from lower than average household incomes, which appear to contribute to a high share of burdened households. Geographically, several California and Florida metropolitan areas rank among the top 25 metropolitan areas, along with major metropolitan areas such as Miami, Los Angeles, Philadelphia, and New York.

Due to distress in the single-family owner market, the prospects for growth in rental demand appear strong over the next 3 to 5 years. Homeownership rates may continue to drift lower, as numerous foreclosures work toward resolution, and the pool of qualifying homebuyers is diminished. Part of the increase in rental households will be satisfied by owner–to–renter conversions in the single-family market; however, the multi-housing rental market will also benefit from increased demand.

Rental demand will also benefit from gradual improvements in economic activity and the likelihood that household formations, especially among younger renters in the prime 20–34-year-old age group, improve. While this group will contribute significantly to the growth rental demand, the large 65+ age category is expected to fuel more than one-third of growth in rental households. Despite their above average homeownership rates, the expanding size of this older demographic group will have an important influence on future renter demand.

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[15] Among 505 areas covered in the 2011 American Community Survey, the correlation coefficient between median renter household income and the share of renters with 50% plus rent payments as a percentage of income was -.31. On the other hand, there is a much stronger negative correlation between a metropolitan area's share of affordably priced rental units (as a percentage of occupied stock) in the share of households that face high rent burdens. The correlation coefficient of the share of affordably priced rental units against the share of renter households that pay 50% or more of income in rent is -.76. Affordably priced units are defined as the approximate share of renters that pay less than 30% of the metropolitan area's median renter household income in rent.
[16] The rankings are out of the 100 largest metropolitan areas.

Exhibit 19 – Metropolitan Areas Ranked by Highest Share of Renter Households
Paying 50% or More of Income Toward Rent

Metro Area	Total Population	Rank	Renter Households	Rank	Median Renter HH Income $	Rank	(Rent as % Household Income) Share 30-49.9%	Rank	Share 50% or more	Rank	Share 30% or more	Rank
Poughkeepsie-Newburgh-Middletown, NY	672,871	80	74,111	86	34,740	20	13.1%	99	37.0%	1	50.1%	7
Baton Rouge, LA	808,242	67	90,099	75	24,560	90	12.7%	100	36.4%	2	49.1%	13
Miami-Fort Lauderdale-Pompano Beach, FL	5,670,125	8	753,065	7	30,850	45	19.5%	6	36.2%	3	55.7%	1
New Orleans-Metairie-Kenner, LA	1,191,089	47	175,497	42	26,203	78	15.7%	71	35.6%	4	51.3%	5
Lakeland-Winter Haven, FL	609,492	88	66,099	93	26,095	79	18.2%	11	34.7%	5	52.9%	2
Rochester, NY	1,055,278	52	135,213	52	25,326	87	15.1%	83	33.4%	6	48.5%	16
Los Angeles-Long Beach-Santa Ana, CA	12,944,801	2	2,130,648	2	38,518	11	18.0%	14	32.7%	7	50.7%	6
Detroit-Warren-Livonia, MI	4,285,832	13	489,443	15	25,975	80	15.2%	79	32.6%	8	47.9%	22
New Haven-Milford, CT	861,113	61	118,731	58	31,122	41	15.8%	67	32.6%	9	48.5%	19
Riverside-San Bernardino-Ontario, CA	4,304,997	12	461,948	16	33,954	27	19.6%	4	32.6%	10	52.2%	4
Orlando-Kissimmee-Sanford, FL	2,171,360	27	286,254	28	31,029	43	20.4%	2	32.5%	11	52.9%	3
Memphis, TN-MS-AR	1,324,108	42	180,528	41	26,560	72	17.3%	24	32.1%	12	49.4%	10
Fresno, CA	942,904	56	130,646	53	28,386	62	16.9%	33	31.6%	13	48.5%	18
San Juan-Caguas-Guaynabo, PR	2,472,829	22	254,590	33	11,806	100	18.0%	15	31.5%	14	49.5%	9
Charleston-North Charleston-Summerville, SC	682,121	79	87,192	79	29,115	57	18.1%	13	31.5%	15	49.5%	8
Dayton, OH	845,388	63	123,622	56	24,326	95	15.9%	64	31.3%	16	47.2%	24
Jackson, MS	545,394	96	61,954	96	24,407	93	16.4%	47	31.0%	17	47.4%	23
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	5,992,414	6	711,979	9	31,990	40	16.1%	59	30.9%	18	47.0%	25
Toledo, OH	650,266	83	93,302	70	22,831	97	14.0%	92	30.9%	19	44.9%	41
New York-Northern New Jersey-Long Island, NY-NJ-PA	19,015,900	1	3,317,034	1	39,451	8	15.3%	77	30.5%	20	45.7%	29
Stockton, CA	696,214	77	88,856	76	34,599	23	18.3%	10	30.3%	21	48.6%	14
Sacramento--Arden-Arcade--Roseville, CA	2,176,235	26	314,457	24	34,308	24	17.8%	17	30.3%	22	48.1%	20
Tampa-St. Petersburg-Clearwater, FL	2,824,724	18	372,515	19	29,673	54	19.1%	7	30.2%	23	49.3%	11
Milwaukee-Waukesha-West Allis, WI	1,562,216	40	243,326	35	27,932	65	15.7%	73	29.8%	24	45.5%	32
Atlanta-Sandy Springs-Marietta, GA	5,365,726	9	676,214	11	32,159	37	15.9%	62	29.8%	25	45.7%	30
United States	311,591,919		40,727,290		30,934		16.4%		28.0%		44.3%	
Urban	229,036,818		23,243,370		30,964		16.5%		28.6%		45.1%	
Rural	74,548,765		5,483,920		30,742		15.2%		23.7%		38.8%	

Sources: Bureau of the Census, 2011 American Community Survey, and CBRE Research calculations

Apart from the challenges of an aging population, evolving rental income demographics are likely provide a unique set challenges for the rental market.   A longer-term term trend of declining rental affordability appears to reflect the inability of renter incomes to match growth in housing costs.   The recent recession has taken an additional toll on renter incomes, especially among lower income groups.   As a result, there is a growing excess demand for affordable units, as the availability of low-cost rental units shrinks. High rent burdens – those that consume more than 50% of household income – are on the rise. The problem of excessive rent burdens affects a wide range of geographic areas from some of the largest centers such as Miami and Los Angeles to a number of smaller secondary markets.

Housing Supply

Overview

After a period where multi-housing supply fell to historically low levels, conditions for new development have improved dramatically over the past year. Improvements in apartment occupancy and rents in several major markets have prompted developers to increase planning activity. During 2012 Q2, multi-family starts (5+ units) reached an annual rate of 209,000 units up from 141,000 units one year earlier. During this time frame, starts increased across all major regions, except for the Midwest. Despite the increase, multi-housing starts still remained below their long-run average (since 1989) of close to 246,000 units.

Exhibit 20 shows the long-term trend in multi-housing completions for buildings that are comprised of 5+ units. In 2011, completions fell just shy of 130,000 units, approaching the record low of 125,000 units completed in 1993. Completions reached a peak of over 300,000 units in the year 2000 and remained above 250,000 units per year through most of the 2000's, until construction plummeted during the recession.

While construction remained fairly steady during early part of the decade, it remained well below levels of previous market peaks registered in the 1970s and 1980s. During the 1970s, construction was supported by strong demographic growth as numerous young renters entered into the housing market, and public housing construction was supported by federal programs. During the early 1980s, tax policy benefits supported growth in condominium as well as rental construction, fueling a period of overbuilding. When tax reform measures took effect in 1986, the incentives for acquiring multi-housing housing diminished; an ensuing period of extreme overbuilding precipitated the collapse of the Savings and Loan industry. In 1993, multi-housing completions fell to nearly one fifth of their peak level in 1986. Thereafter, multi-housing development activity steadily improved during the late 1990s as occupancies and rents increased.

Exhibit 20 – Multi-Housing 5+ unit Completions
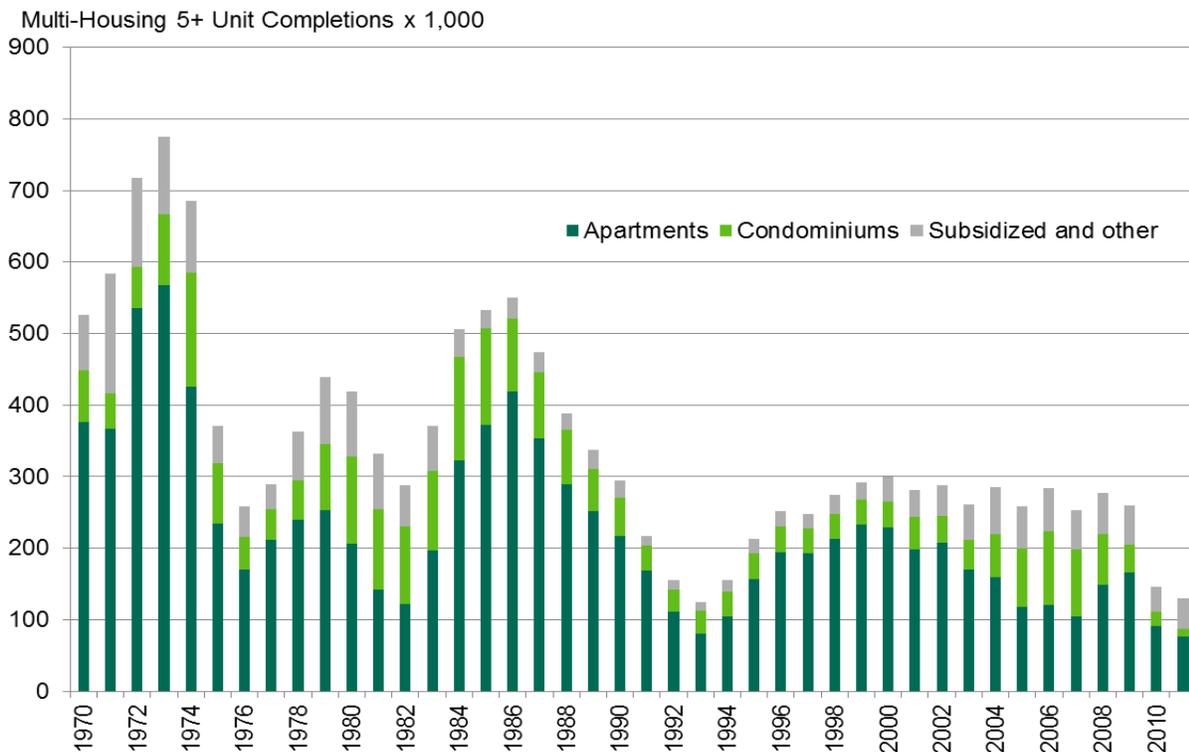
Source: Bureau of Census

To a large extent, the profile of multi-housing construction reflected trends in the single-family for-sale market during the middle of the 2000s. For-sale condominium completions comprised an increasing share of new construction due to the generous mortgage terms available to borrowers. The condominium share of completions increased from under 12% in 1999, to a peak of more than 36% in 2006 and 2007, which represented close to 100,000 condominium completions during each of these years. As foreclosures rose in the condominium market, construction plummeted: in 2011 completions fell to only 1/10 of their peak, to reach their lowest level over the past three decades.

Meanwhile, construction related to low-income housing remained a stabilizing force during the decade. After falling to low levels during the mid-1990s, construction picked up by 2004, and accounted for more than 20% of multi-housing completions through the remainder of the decade. After reaching a low in 2010, subsidized construction increased and represented close to one-third of multi-housing completions in 2011. Clearly the smaller contribution of rental apartments to overall multi-housing building during the past decade was a departure from previous experience. Over the long-term, rental apartments accounted for over 65% of total completions compared with 19.5% for condominiums, and 14.6% for subsidized and other multi-housing construction.

Affordable Rental Supply

As noted in the previous section on rental housing demand, the gap between low income renter households and the stock of affordable units has widened significantly over the past decade. The growing gap in available affordable housing units for low-income renters is due to a number of sources, including a decline in low-cost private rentals. In addition, the public housing stock, which historically has served very low income segments of the population, has been declining since 1994.

In 2008, public rental housing units totaled 1.14 million units, down over 19% from 1994.[17]   Public housing has declined as federal housing programs have shifted support from direct subsidy of low-cost units into tax credit incentives and community block grant for state and local affordable housing programs. The aging of the public housing stock has also made the preservation of affordable units challenging.

Over the past two and one-half decades, new affordable housing development has been supported by the federal Low-Income Housing Tax Credit (LIHTC) program.   The program allows investors in tax credit developments to reduce federal income taxes by an equal amount of tax credits received. Tax credits are commonly syndicated to investors, who received a credit for 10 years, provided that properties remain occupied by low-income households for 15 years. The maximum allowable rent is set based on 30% to 60% of median family income, which depends on the proportion of tax credit units within a particular development. Tax credits are allocated to state housing agencies on the basis of population.

In 2010, states could award federal tax credits of two dollars per capita every year. The amount is adjusted for inflation on an annual basis.[18] Since the implementation of the program in 1987 through 2008, it is estimated that over 1.76 million units have been placed into service, representing more than $10 billion in tax credit incentives. Tax credit units have accounted for a large share of total multi-housing construction in several states. According to Danter Company, the tax credit unit share of total multi-housing permits issued over this period ranged from as high as 67% in Louisiana and 54% in Oklahoma, to as low as 3.9% in Nevada and 7% in Hawaii. Nationally, tax credit units accounted for approximately 15.7% of multi-housing permits issued.[19]

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[17] Sources: Committee on Ways and Means, US House of Representatives, 2008. "2008 Greenbook: background material and data on the programs within the jurisdiction of the Committee on Ways and Means." US Government Printing Office. Available at http://ways andmeans.house.gov/documents.asp? Section = 2168; and Joint Center for Housing Studies of Harvard University, 2009. "State of the nation's housing 2009." Available at http://www.jchs.harvard.edu/publications/markets/som2009/som 2009.pdf.

[18] For an excellent overview of the LIHTC program, see Swartz, Alex, "The Low Income Housing Tax Credit" in "Housing Policy in the United States", second edition, New York: Routledge, 2010.

[19] Source: Danter Company, statistics available at: http://www.danter.com/taxcredit/stats.htm.

During the recession the demand for tax credits fell sharply, leaving some states with unallocated credits, and developers with a significantly lower amount of equity raised for new projects due to low prices paid for tax credits. Federal programs sponsored by HUD and the US Treasury Department to help support the market in 2009, before an increasing number of profitable private corporations stepped into purchase tax credits beginning in late 2010. As a result, tax credit pricing has recovered well in major metropolitan areas, although some secondary markets continue to face low prices.

However, the dramatic improvement thus far in tax credit pricing should support higher levels of development over the next few years. At the same time, impending Federal budget pressures on HUD could reduce funding for community block grant programs, which could in turn reduced support for construction and redevelopment of assisted housing.[20]

Higher levels of tax financed development will be necessary to help reduce the under–supply of affordable units. In addition to the Harvard Joint Center study referenced in the previous section, analysis by HUD indicates that while the overall stock of rental units increased by 7.3% between 1999 and 2009, there was an actual decline in the number of affordable units available to households with very low incomes. All of the net growth in rental supply has come from units that are affordable to households that earn 50% or greater of median family income.[21] Renters entering the market face a dwindling share of low cost rentals. According to the Census Bureau's Housing Vacancy Survey, the share of vacant units priced less than $500 per month stood at 22% in 2011, down from 35% in 2004. Meanwhile the share of vacant units priced at $800 or more per month increased to 39% from 29%. [22]

Vacancy Trends

Both affordable and market rate apartment construction will be supported by higher occupancy rates, which in turn will help support growth in rents. After rising to unprecedented levels during the recession, vacancy rates in both the owner and renter markets, along with professionally managed rental apartments have been recovering quickly in response to strong growth in rental demand.   Exhibit 21 shows the trend in vacancies for the rental, owner, and multi-housing apartment market.

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[20] For example see Berton, Brad, "Affordable Housing Demand", Urban Land, April 2011. Available at http://urbanland.uli.org/Articles/2011/Mar/BertonAffordable, and Bergsman, Steve, "Investors pay premium for affordable housing tax credits", Inman News, October 12, 2012. Available at http://www.inman.com/buyers-sellers/columnists/sbergsmancoxnet/investors-pay-premium-affordable-housing-tax-credits.
[21] Source: US Department of Housing and Urban Development, "Worst Case Housing Needs 2009: Report to Congress", 2011. Available at http://www.huduser.org/portal/publications/affhsg/wc_HsgNeeds09.html.
[22] Source: Bureau of Census, Housing Vacancies and Homeownership Survey - Table 2, "Rental and homeowner vacancy rates, by selected characteristics and percent distribution of all units", available at http://www.census.gov/housing/hvs/data/ann11ind.html.

Exhibit 21 – Renter, Owner and Apartment Vacancy Rates
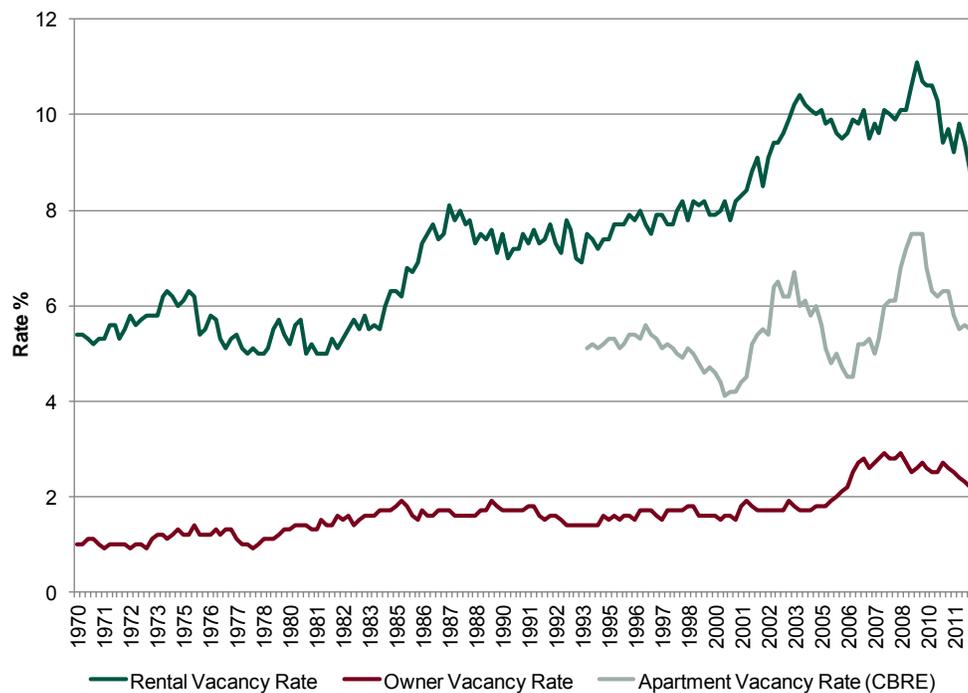
Sources: Bureau of Census and CBRE-EA

During the depths of the recession, the vacancy rate in the rental market reached a high of 10.7%, before sharply dropping to 8.6% by 2012Q2, the lowest level in a decade. Throughout the early 2000's rental vacancies remained relatively high compared to previous decades, reflecting the fact that a significant portion of rental demand was siphoned off into the owner market, where increases in demand were satisfied by new construction. Indeed, owner vacancy rates remained very low during the early 2000s, and then rose substantially during the onset of the recession in early 2008.

During this time frame, the owner vacancy rate approached 3%, almost double the level registered at the beginning of the decade. This increase reflected the collapse of home sales and prices, and the new single-family construction activity, which increased the inventory of vacant for-sale new homes. At the same time, rising foreclosures increased the inventory of vacant homes. As supply conditions have gradually improved in the owner market over the past four years, owner vacancies have drifted lower.

The apartment market followed a similar profile to the broader rental market over the past decade. According to CBRE-EA, which compiles an occupancy survey of more than 25,000 professionally-managed, market-rate apartments across 60 metropolitan areas through its partner MPF Research, vacancy reached a low of 4.5% in mid-2006, before increasing to a peak of 7.5% during each of the last three quarters of 2009. With the improvement in rental demand, apartment vacancies have fallen steadily over the course of the past three years. In 2012Q2, vacancies reached 5.2%, falling below their long-run average of 5.5%.[23]

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[23] Reflects the average vacancy calculated from 1994Q1 through 2012Q2. Additional detail on metropolitan area vacancy rates and the CBRE-EA baseline outlook is found in the following "Multi-Housing Outlook" section.

Exhibit 22 – Rental Vacancy by Select Characteristics, 2011

Concept	Vacancy Rate
Total Rental Vacancy Rate	9.5
Housing units in structure	
1 unit in structure	8.9
2 to 4 units	9.3
5 to 9 units	9.8
10 units or more	10.6
..2 or more units	10.0
..5 or more units	10.3
Year structure built	
April 1, 2000 or later	7.7
1995 to 3/31/2000	5.9
1990 to 1994	3.7
1980 to 1989	13.3
1970 to 1979	22.5
1960 to 1969	12.5
1950 to 1959	9.1
1940 to 1949	6.6
1939 or earlier	18.7

Source: Bureau of Census, Housing Vacancies and Homeownership

Exhibit 22 also provides detail on rental vacancies across structure type and age, from the Census Bureau's annual 2011 Housing Vacancy Survey. Single family rentals registered a lower than averaged vacancy rate in the survey compared to multi-housing rentals. The exhibit also provides detail on the distribution of vacancy by property age.

Metropolitan areas face varying degrees of excess supply in their rental markets. Furthermore, their pattern of recovery is shaped by excess supply in both the for sale and rental market. Single-family owner markets were especially hard hit in the major markets in Arizona, California, Florida, and Nevada, which witnessed some of the steepest declines in home prices nationally.[24] In turn, several of these markets continue to witness high levels of rental and owner vacancy rates. Exhibit 23 shows 2011 rental and owner vacancy rates for major metropolitan areas.

In addition to vacancy levels, the exhibit shows the amount of potential vacancy "overhang" in the owner and rental market, along with a combined measure for both market segments. Vacancy overhang is defined as the difference in current vacancy from the market's long-term average. The measure attempts to quantify the degree of excess supply, taking into account long-run differences in average vacancies across markets. Markets are ranked on the basis of gross vacancy overhang. As Exhibit 23 shows, major markets such as Orlando, Tampa, Ventura, and Las Vegas ranking among the highest top ten markets in terms of gross vacancy overhang.

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[24] For an analysis of the regional dimension of the housing crisis, see Nechayev and Wheaton, "Foreclosures: Where is the Problem?" CBRE-EA About Real Estate, March 6, 2009.

Metropolitan areas with high levels of vacancy in both supply in both the owner and renter market may face slower recovery as excess inventories are gradually worked off through greater property sales or rental absorption. As we shall see in the next section, supply in both the owner and renter market play an important role in determining the supply/demand balance in the renter market, through owner to renter conversions. Therefore excess supply in the owner market, consisting of both single-family and multi-housing condominiums, will have an important role in determining occupancy and rent performance in the rental market.

Exhibit 23 – 2011 Housing Vacancy Overhang

	Current Difference in Vacancy from Long-Term Average					
Market	Rental Vacancy Rate	Rental Vacancy Overhang	Homeowner Vacancy Rate	Homeowner Vacancy Overhang	Gross Vacancy Overhang	Rank
Akron, OH	11.0	1.3	3.8	2.3	5.8	2
Albany-Schenectady-Troy, NY	9.6	0.5	1.8	0.8	2.3	19
Atlanta-Sandy Springs-Marietta, GA	11.6	0.5	4.3	2.3	1.8	27
Austin-Round Rock, TX	6.4	-2.9	0.6	-0.6	-0.7	54
Baltimore-Towson, MD	10.7	3.4	2.8	1.3	1.9	26
Birmingham-Hoover, AL	12.6	2.5	1.6	-0.2	1.2	36
Boston-Cambridge-Quincy, MA-NH	5.5	0.6	1.4	0.6	1.2	37
Buffalo-Cheektowaga-Tonawanda, NY	10.7	1.0	2.0	1.0	4.4	5
Charlotte-Gastonia-Concord, NC-SC	10.1	2.0	1.9	0.1	-0.4	48
Chicago-Naperville-Joliet, IL	9.9	1.5	3.6	2.3	2.7	16
Cincinnati-Middletown, OH-KY-IN	11.1	2.7	3.0	1.8	0.9	41
Cleveland-Elyria-Mentor, OH	11.0	1.6	1.9	0.8	-0.9	58
Columbus, OH	8.2	-0.8	3.2	1.8	0.6	42
Dallas-Ft. Worth-Arlington, TX	11.8	1.4	2.0	-0.2	-0.1	47
Dayton, OH	11.1	3.0	5.1	3.3	4.4	5
Denver-Aurora, CO	6.8	-0.9	1.8	-0.1	-2.2	63
Detroit-Warren-Livonia, MI	16.8	7.8	1.8	0.7	3.0	11
Fresno, CA	8.0	-0.4	1.0	-0.8	1.9	24
Grand Rapids-Wyoming, MI	6.1	-4.0	2.6	1.6	-0.5	49
Greensboro-High Point, NC	11.9	3.8	3.0	1.4	2.2	21
Hartford-West Hartford-East Hartford, CT	10.0	1.8	1.8	0.2	1.8	30
Honolulu, HI	6.9	1.6	0.7	-0.3	2.8	15
Houston-Baytown-Sugar Land, TX	16.5	4.2	2.0	-0.1	-1.1	61
Indianapolis, IN	13.1	4.1	3.4	1.3	0.0	46
Jacksonville, FL	13.3	4.4	2.8	0.5	2.9	13
Kansas City, MO-KS	12.1	1.8	2.7	1.4	1.6	33
Las Vegas-Paradise, NV	12.1	2.5	4.1	1.6	3.7	8
Los Angeles-Long Beach-Santa Ana, CA	5.3	-0.8	1.8	0.4	1.7	31
Louisville, KY-IN	10.2	0.3	2.4	1.1	2.6	17
Memphis, TN-AR-MS	15.4	6.8	3.0	1.4	3.5	9
Miami-Fort Lauderdale-Miami Beach, FL	11.8	4.0	1.8	-0.3	2.9	13
Milwaukee-Waukesha-West Allis, WI	7.6	1.7	2.0	1.0	0.6	43
Minneapolis-St. Paul-Bloomington, MN-WI	6.7	1.2	1.8	0.8	-0.5	49
Nashville-Davidson-Murfreesboro, TN	8.2	1.5	2.2	0.7	-1.0	59
New Orleans-Metairie-Kenner, LA	13.1	2.7	2.1	0.5	-0.7	54
New York-Northern New Jersey--Long Island, NY	6.4	2.0	2.6	0.0	1.0	38
Oklahoma City, OK	9.9	-5.8	3.9	1.4	2.2	22
Omaha-Council Bluffs, NE-IA	11.1	2.6	1.9	1.1	2.9	12
Orlando, FL	19.0	8.8	2.5	0.3	7.4	1
Philadelphia-Camden-Wilmington, PA	12.7	3.3	1.6	0.2	1.4	35
Phoenix-Mesa-Scottsdale, AZ	10.9	0.8	3.1	0.9	2.3	20
Pittsburgh, PA	6.3	-2.1	2.2	0.7	-0.8	56
Portland-Vancouver-Beaverton, OR-WA	3.4	-2.8	2.0	0.7	-1.8	62
Providence-New Bedford-Fall River RI-MA	8.8	2.1	2.2	1.0	3.4	10
Raleigh-Cary, NC	8.9	-3.9	2.9	1.0	0.6	43
Richmond, VA	13.7	4.7	2.4	0.5	1.9	24
Riverside-San Bernardino-Ontario, CA	8.4	0.1	3.5	0.9	1.6	34
Rochester, NY	4.8	-2.3	1.0	-0.3	1.0	38
Sacramento-Arden-Arcade-Roseville, CA	7.1	-0.7	2.4	1.0	-1.0	59
St. Louis, MO-IL	12.6	5.5	2.9	0.8	2.5	18
Salt Lake City, UT	7.4	-2.7	2.2	0.8	1.0	38
San Antonio, TX	9.2	2.7	1.5	-0.1	-0.5	49
San Diego-Carlsbad-San Marcos	6.9	1.7	1.9	0.0	1.8	27
San Francisco-Oakland-Fremont, CA	6.8	2.0	1.8	0.6	0.3	45
San Jose-Sunnyvale-Santa Clara, CA	4.8	-1.5	0.9	-0.1	-0.7	53
Seattle-Tacoma-Bellevue, WA	6.7	-2.3	2.6	1.6	1.7	32
Syracuse, NY	5.7	-6.6	0.3	-1.1	4.1	7
Tampa-St. Petersburg-Clearwater, FL	11.7	1.8	3.8	1.2	5.4	3
Tucson, AZ	14.8	5.7	4.2	2.8	1.8	27
Tulsa, OK	13.0	3.5	2.5	0.2	-0.5	49
Ventura, CA	3.2	-0.8	0.5	-0.6	4.5	4
Virginia Beach-Norfolk-Newport News, VA	9.4	0.4	3.2	1.3	-0.9	57
Washington-Arlington-Alexandria, DC-VA-MD-WV	7.9	0.5	1.8	0.0	2.1	23

Sources: Bureau of Census, CBRE Research Calculations

Owner to Renter Conversions and the Supply of Rental Units

The supply of rental units is not only determined by buildings completed for rent in any given period, but also demolitions and units converted from owner to renter use. In any given time frame, owner-to-rental conversions in both the single- and multi-housing rental market can play an important role in satisfying rental demand.   As analysis by Nechayev and Wheaton (2012) shows, conversion rates are positively linked with changes in homeownership rate and changes in home price-to-rent ratios.   As they note, reported rental completions fell far short of rental demand growth during the two most recent periods of falling homeownership rates, during 1981-1986 and 2005-2011.

Given a very wide gap in reported completions and renter household growth, one would have expected the rental vacancy rate to decline sharply over these periods. Instead, conversions played an overwhelming role increasing the rental stock over these periods, allowing growth in rental supply to keep pace with demand. Completions intended for rent, they note, are relatively constant over time and therefore rarely satisfy the cyclical component of rental demand; just the opposite is the case for net conversions.   Investors tend to move quickly into markets as homeownership rates change and take advantage of conditions where home prices are low relative to rents, converting units into rentals, and then capitalizing on potential future home price appreciation as the homeowner market stabilizes.[25]

Exhibit 24 shows the relationship between rental demand, building completions, and total rental supply changed over the past two decades. In the 1990-2000 decade, stock growth lagged demand growth by 500,000 units, resulting in a decrease in vacant units. The rental vacancy rate fell by 1.5% over this period. In the 2000-2010 decade, stock growth exceeded demand growth by 1,200,000 units which represents an increase in vacant for rent units of approximately 4%. The net increase in rental stock was above new construction by a whopping 3.7 million.   If demolitions as a percent of stock are assumed at 0.2% per year over the decade, it implies that conversions would have been close to 4.3 million, or more than twice the contribution to new supply as rental construction.

### Exhibit 24 – Changes in Rental Supply, Demand and Stock by Decade
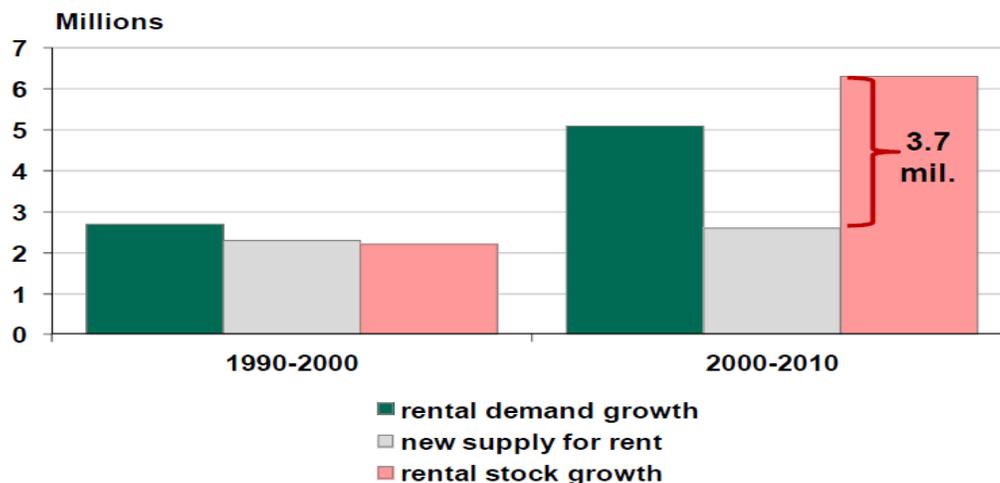
Source: Bureau of Census and CBRE-EA

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[25] This section follows Nechayev, Gleb, and Wheaton, Bill, "Conversions - An Invisible Hand", unpublished paper abstract, CBRE-EA, 2012.

Exhibit 25 shows changes in rental demand and against building completion rates, along with an estimate of implied net owner-to-renter completion rates. As the graph shows, owner to renter conversion rates are highly correlated with the change in rental demand. In contrast, building completion rates are rather steady over time and are less coordinated to the change in rental demand. Conversions have a very significant impact on the supply and demand balance in the rental market: in their absence, rental vacancies would swing much more dramatically in response to changes in demand. Furthermore, due to the increase in supply from conversions, dramatic changes in overall rent growth tend to be muted. Therefore the performance of rental market is not only closely linked to the current supply of rental units, but also the supply and pricing of units in the multi-housing condominium and single-family owner markets.

Exhibit 25 -- Changes in rental demand and Implied Net Conversions of Rental Stock
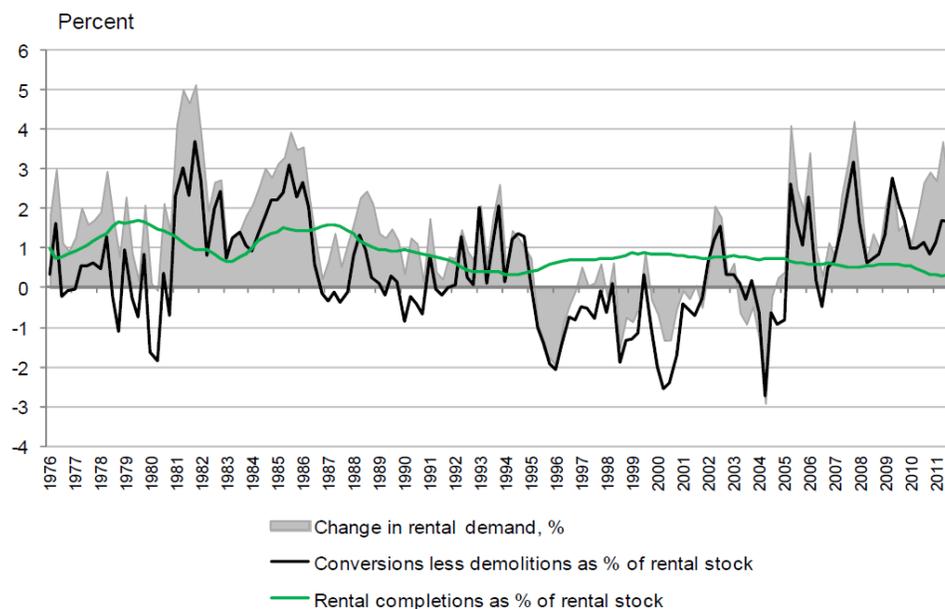
Source: Bureau of Census and CBRE-EA

The Development Pipeline

Multi-housing development activity will clearly be on the upswing over the next several years. According to Dodge/CBRE-EA Pipeline, there are close to 850,000 units, representing more than four years of supply currently the active planning stages. Over the past year, the volume of projects in active planning has increased by more than 12%. Most of the recovery in multi-family construction has been concentrated around market rate development in six primary markets: New York, Los Angeles, Chicago, Washington DC, San Francisco, and Boston. These markets account for approximately 28% of units in active planning stages. However, the recovery in multi housing development plans is becoming more widespread across country. Over the past year markets with the largest percentage increase in units in active planning included Phoenix and Tucson, two markets that faced considerable oversupply during the recession. Other markets that have become very active include northern New Jersey, Portland, and Charlotte. [26]

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[26] The outlook for apartment supply at the national and local level is described in more detail in the next section, which details the CBRE-EA multi-housing outlook, including information on supply from the Dodge Pipeline.

New multi-housing rental construction activity is on the increase, as completions are likely to surpass a rate of 200,000 units per year by early 2013. The bulk of the increase in construction will be concentrated in market rate rental apartments, but modest gains in tax-credit affordable housing investment are also expected. The increase in building activity will provide a significant increase in the demand for mortgage financing. Banks and other lenders will benefit from increased requests for construction financing, while permanent lenders could see requests for permanent loans double over levels witnessed just last year in a fairly short time frame. Increases in tax-credit driven affordable housing activity will place demands on lenders and constrained state housing finance agencies. This will also come at a time when multi-housing loan refinance needs remain at historically high levels. Therefore, it is likely that the diverse sources of capital will be required to satisfy the needs of an evolving multi-housing lending market.

The Multi-housing Outlook

In the previous section, we detailed some of the major trends in the economy and how they related to the owner and rental housing market.   In addition to supply and demand indicators, we profiled some of the broad trends in housing values and the recovery of investment in the rental multi-family sector.   The improvement in rental demand, reflecting sharp declines in the homeownership rate, has contributed to improvement in occupancy and rents. Demographic changes will also likely continue to support expansion in rental demand.   At the same time, however, rental affordability has declined over the past decade, especially among lower income groups. Part of the increase in demand has been met through increases in affordable supply through the development of assisted and low-income tax credit housing, but a gap in affordable needs remains.   While the development pipeline has increased in response to rents; however, it is unclear whether the new supply will closely match the needs of the evolving income and demographic profile of renters.

The following section provides detail on CBRE-EA Multi-Housing Outlook.   The Outlook provides CBRE-EA's forecast of how multi-housing supply and demand trends are likely to evolve across the sixty largest metropolitan areas. The Outlook assesses supply and demand trends for multi-housing properties with 5+ units.   As shown previously in Exhibit 9, these properties account for approximately 17 million, or 43% of the more than 39 million rental units nationally.   Among the 60 largest markets in the US, properties with 5+ units comprise a total of 14.3 million units. The apartment vacancy, demand (occupied stock), and rent figures represent MPF Research's survey of 25,000+ professionally managed apartment units across the major metropolitan markets.

Apartment Expansion Stays the Course

The U.S. multi-housing expansion continues in both real estate fundamentals (demand, supply, rent, and occupancy) and in sales activity and pricing. CBRE-EA expects revenue growth in most markets to be stronger than it has been historically, even as it slows down from the pace of the last couple of years. In terms of opportunity for investment, secondary markets continue to look attractive in comparison to primary markets, given their fundamentals and pricing. There is also a growing concern on the supply side, with more than four years' worth of new development now in various stages of planning, some of which might be too expensive, given the income profile of future renters.

The weak housing market creates some upside potential for apartment demand in the near term, but there is also increasing evidence that home prices are near their bottom, and reasons for them to start rising in the next two to three years. Just as rising rents are now leading the recovery in home prices, rising home prices will lead to higher rents, due to a strong positive link between the two. Variation in home price trends should have a tangible impact on apartment rent growth across markets over the next five years.

Aside from job growth, the interplay and cross-currents of the expanding rental market and the recovering owner market will be the second major factor driving apartment performance. Home price trends are likely to become even more a factor than they have been recently, as apartment occupancy is now above historical norm in most markets and has less room for increases than a year or two ago. From this perspective, the sooner home owner demand recovers and home prices start rising, the better it will be for apartment rents. A struggling housing market can only benefit apartment performance for so long; in fact, if home prices were to slide for a few more years, it would turn into a headwind by bringing on millions of own-to-rent conversions that could lead to higher rental vacancy rates, even with the rapid growth in the number of renter households.

Demand Trends

In the second quarter of 2012, multi-housing demand expanded by 161,000 units, or 1.2% on a year-over-year basis—keeping to the pace of growth established last year. The largest contributors to national demand growth over the last four quarters were New York, Houston, Los Angeles, Dallas, Chicago, Atlanta, Orange County, Austin, Tampa, and Fort Worth—together accounting for more than half of total net absorption over the period. The national vacancy rate declined to 4.8%—60 basis point (bps) below the year-ago level and 50 bps below the 1994-2011 average.

Vacancy rates declined in 58 markets over the past four quarters, with the strongest improvements (declines of more than 150 bps between Q2 2011 and Q2 2012) reported in Fort Worth, Houston, Cincinnati, Birmingham, Salt Lake City, Charlotte, Hartford, and Orlando. Markets with the lowest vacancy rates (averaging below 3.5% over the last 4 quarters) include Pittsburgh, San Jose, Minneapolis, Boston, Providence, Edison, Oakland, Hartford, Newark, and San Francisco. Markets with the highest vacancy rates (averaging above 7% over the last 4 quarters) include Tulsa, Phoenix, Houston, Tucson, Memphis, Las Vegas, Atlanta, and Jacksonville. Vacancy rates currently more than 150 bps below their respective market's 1997-2011 average can be found in Greenville, Nashville, Minneapolis, Portland, Indianapolis, Hartford, Louisville, Detroit, Cleveland, Dayton, Columbus, and Pittsburgh. Rates more than 100 bps above their market's 1997-2011 average can be found in Las Vegas, Jacksonville, Atlanta, Norfolk, Newark, Memphis, and Ventura.

Exhibit 26 -- Apartment Demand Closely Follows Job Growth
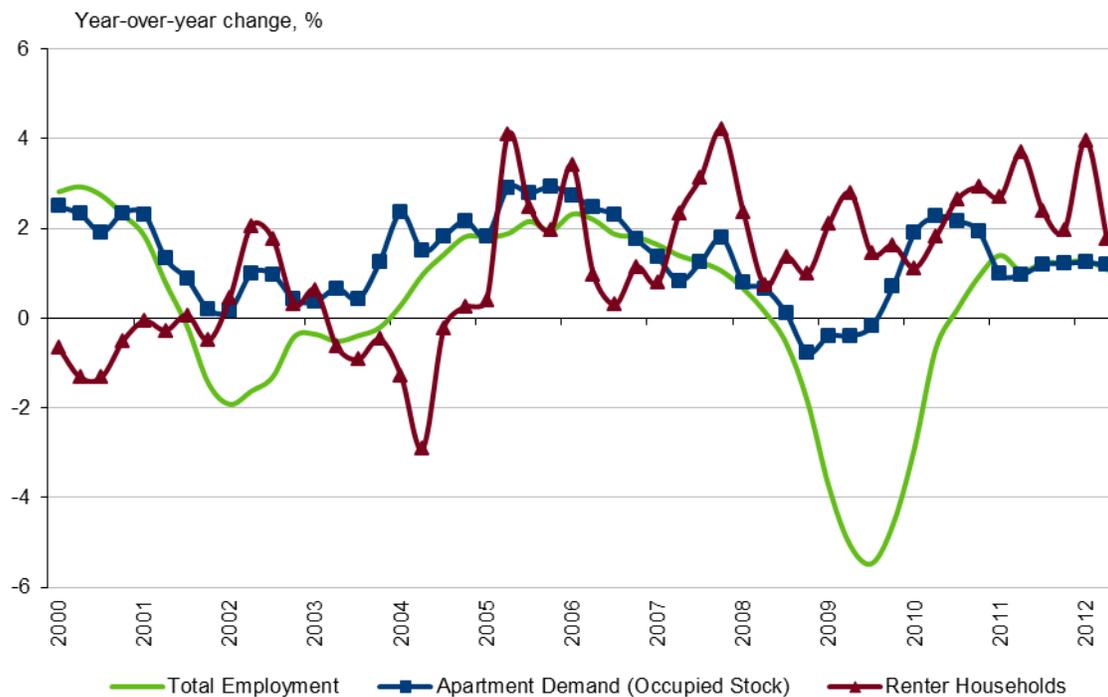
Sources: Bureau of the Census, CBRE EA

Apartment demand growth continues to be driven by two factors: job growth and rapid expansion in broad rental demand. As the chart above shows, apartment demand grew in tandem with jobs and this growth was close to historical norm. The improving economy and broader housing market should help demand expansion to continue, with growth in occupied stock averaging 1.2% per year over the next five years; for comparison, 1.3% per year was averaged over the last 3 years and 0.9% over the last five.

The U.S. labor market slowed considerably in Q2 2012, with just 329,000 jobs being added—0.25% growth—which was less than half of Q1's 696,000 jobs/0.53% growth. Markets leading in relative job growth (over 2% growth from a year ago) included San Jose, Louisville, Houston, San Francisco, Tulsa, Austin, Oklahoma City, El Paso, Denver, Salt Lake City, Cincinnati, Phoenix, Seattle, and Detroit. The slowest-growing (less than 0.5% growth from a year ago) included Greenville, Philadelphia, Jacksonville, West Palm Beach, Cleveland, Birmingham, Edison, St. Louis, Albuquerque, Providence, and Fort Lauderdale.

Most markets are still in the early stages of their job recoveries though, and the U.S. as a whole is 4.9 million jobs below the peak it reached in Q1 2008. Even if U.S. employment continues to add about 200,000 jobs per month— which is well below the pace of a typical recovery—it will not return to pre-recession levels before the second half of 2014. The depth of job losses during the recession and the prolonged recovery are key factors behind the relatively modest projected pace of growth in housing demand overall, as measured by the number of households.

Another key factor affecting apartment demand growth (although unlike job growth, its impact is indirect) is change in housing tenure, or the share of households that own vs. rent. U.S. broad rental demand continues to expand rapidly as more existing households shift from owning to renting and as more newly formed households end up renting homes rather than buying them. According to the Housing Vacancy Survey (HVS) conducted by the Bureau of the Census, U.S. housing demand grew by 809,000 households between Q2 2011 and Q2 2012, including 326,000 in the South; 212,000 in the West; 202,000 in the Midwest; and 69,000 in the Northeast. During the same period, the

national homeownership rate witnessed a 40-bps drop, from 65.9% to 65.5%; homeownership rates declined from 68.2% to 67.4% in the South, 60.3% to 59.7% in the West, 70% to 69.6% in the Midwest, and increased from 63% to 63.8% in the Northeast. Overall household formation and a decline in the homeownership rate mean that the number of renter households nationwide has increased by 684,000—including 410,000 in the South; 241,000 in the West; 166,000 in the Midwest; and a 133,000 decline in the Northeast.

Multi-housing Supply Trends

For the United States, in Q2 2012, multi-housing (5+ units) permits increased to an annualized pace of 249,000 from 232,000 units the previous quarter; starts declined to 207,000 from 216,000; and completions increased to 141,000 from 137,000 units. Permits, starts, and completions remain below their 1989-2008 respective averages of 301,000; 265,000; and 253,000. Given the historical relationship between starts and completions, deliveries are on track to surpass 200,000 units by late 2012-early 2013—up from the annual pace of about 130,000 units in 2011.

Across the 60 markets in CBRE EA coverage, estimated rentable multi-housing completions increased to 34,784 units in Q2 2012, from 14,776 a year earlier. Well over half of these completions were concentrated in New York, Houston, Washington DC, Los Angeles, Seattle, Dallas, Austin, Orange County, Boston, and the San Francisco/Bay Area markets. In terms of construction rates (percentage growth in rentable multi-housing inventory), Tulsa, Austin, Raleigh, Orange County, Salt Lake City, Seattle, El Paso, Houston, Dallas, and Edison led the way last quarter. Based on multi-housing permits issued across the 60 markets, rentable completions are estimated to increase from 53,086 units in 2011 to 125,189 units in 2012.

Exhibit 27 – Multi-housing Starts are still below the Norm
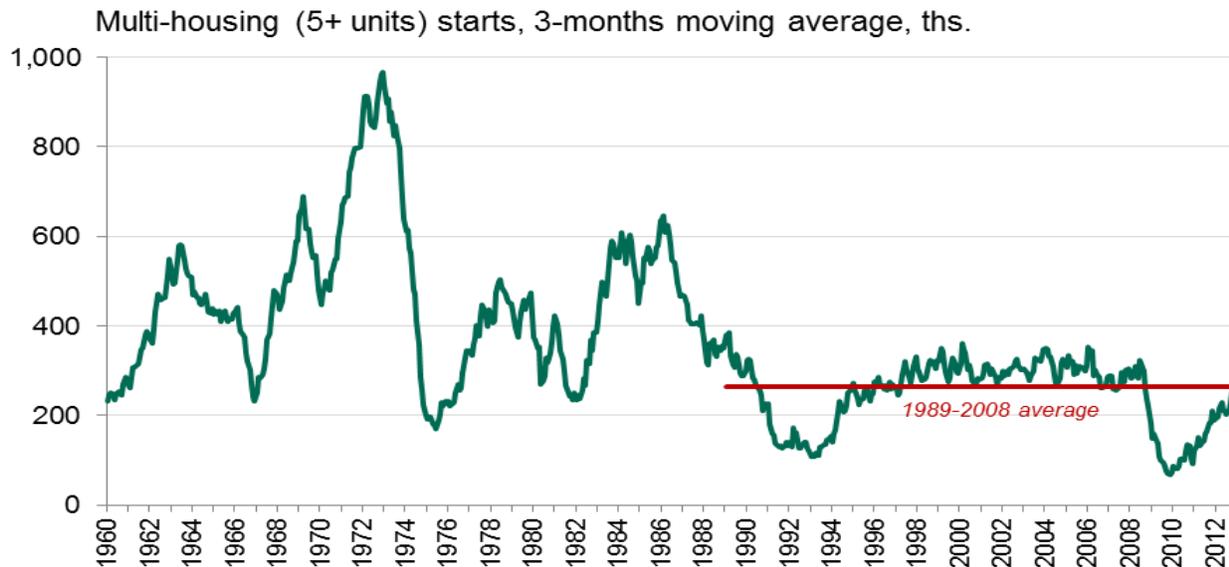
Sources: Bureau of the Census, CBRE EA

Across the 60 markets in CBRE EA coverage, estimated rentable multi-housing completions increased to 34,784 units in Q2 2012, from 14,776 a year earlier. Well over half of these completions were concentrated in New York, Houston, Washington DC, Los Angeles, Seattle, Dallas, Austin, Orange County, Boston, and the San Francisco/Bay Area markets. In terms of construction rates (percentage growth in rentable multi-housing inventory), Tulsa, Austin, Raleigh, Orange County, Salt Lake City, Seattle, El Paso, Houston, Dallas, and Edison led the way last quarter. Based on multi-housing permits issued across the 60 markets, rentable completions are estimated to increase from 53,086 units in 2011 to 125,189 units in 2012.

The three charts below put supply trends in a historical context. The first chart shows current multi-housing (5+ units) permits relative to 1989-2008 averages, across major markets. The second and third charts focus on apartment starts over the past four quarters, and completions expected over the next four quarters, relative to 2001-2011 averages, as reported by Dodge/CBRE-EA Pipeline. All three indicators show that over the next four quarters, new supply will remain below the historical norm nationally. There is wide variation in construction activity across markets, however. Most markets are well into the expansion phase: their rents and revenues are above pre-downturn levels, and development has picked up in recent quarters. Among such markets are New York, Chicago, Washington DC, Boston, San Francisco, Austin, Baltimore, Dallas, Houston, Minneapolis, Philadelphia, and Raleigh.

Over the next four quarters, rentable multi-housing completions (which we estimate from permits over the past four quarters) will surpass 1989-2008 averages by more than 50% in Austin, Norfolk, Tulsa, Newark, Baltimore, Fort Worth, and El Paso; by 30-50% in Oklahoma City, Boston, San Jose, Philadelphia, and Greensboro; and by 10-30% in Washington DC, Nashville, Richmond, Dallas, Columbus, and Raleigh. In contrast, estimated completions in Detroit, Miami, Atlanta, Chicago, and Phoenix will be less than 50% of the historical norm.

The number of apartments targeted for completion in the next four quarters (as reported by Dodge/CBRE EA Pipeline) will double the 2000-2011 average in Raleigh, with Minneapolis not far behind. Other markets to see apartment supply pressure rise next year include Baltimore, Austin, and San Francisco. In comparison to their historical norms, far fewer apartments will be delivered in Detroit, Phoenix, Atlanta, and New York over the near term.

Exhibit 28 - Ratio of Last 4 Quarters' Multi-housing (5+ units) Permits to 1989-2008 Avg.
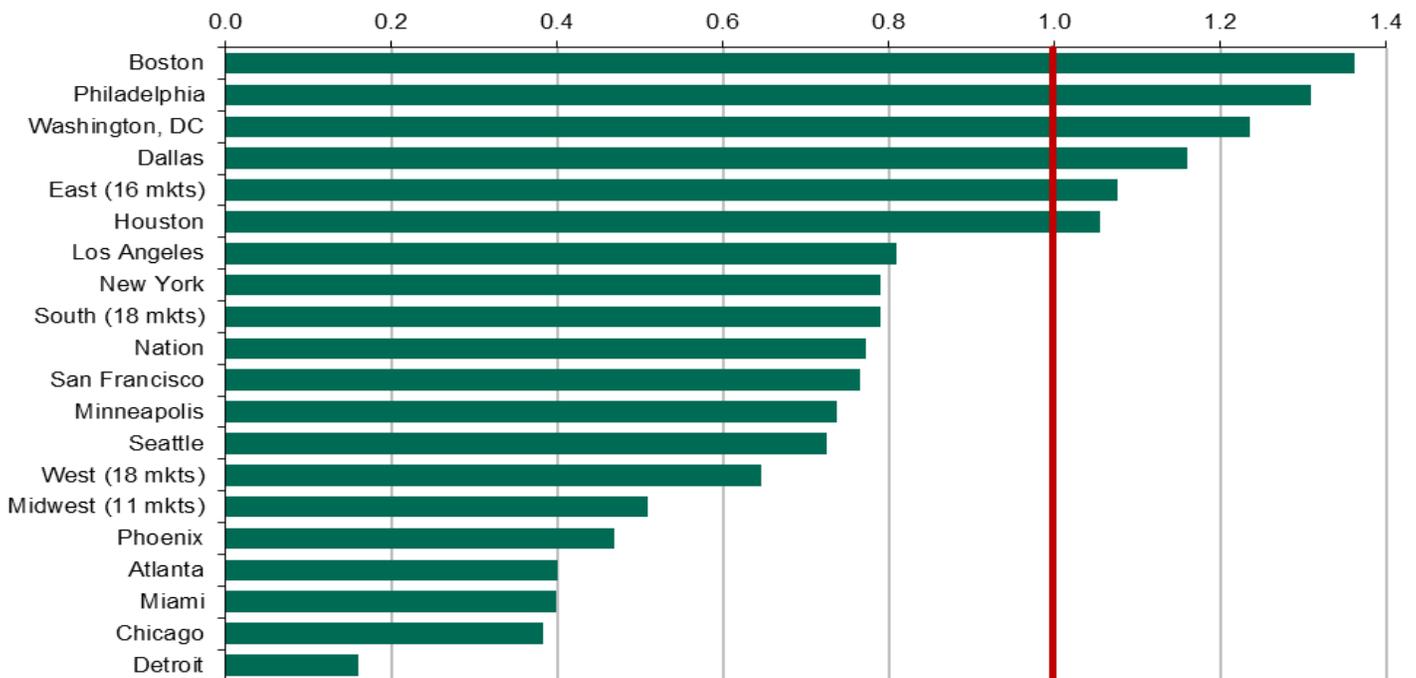
Sources: Bureau of the Census, CBRE EA

Exhibit 29 -- Ratio of Last 4 Quarters' Apartment Starts to 2000-2011 Avg.

	0.0	0.5	1.0	1.5	2.0	2.5
San Francisco						
Baltimore						
Raleigh						
Minneapolis						
Seattle						
Austin						
Dallas						
Chicago						
Philadelphia						
Boston						
Washington, DC						
Midwest (11 mkts)						
South (18 mkts)						
East (16 mkts)						
Nation						
West (18 mkts)						
Houston						
Miami						
Los Angeles						
New York						
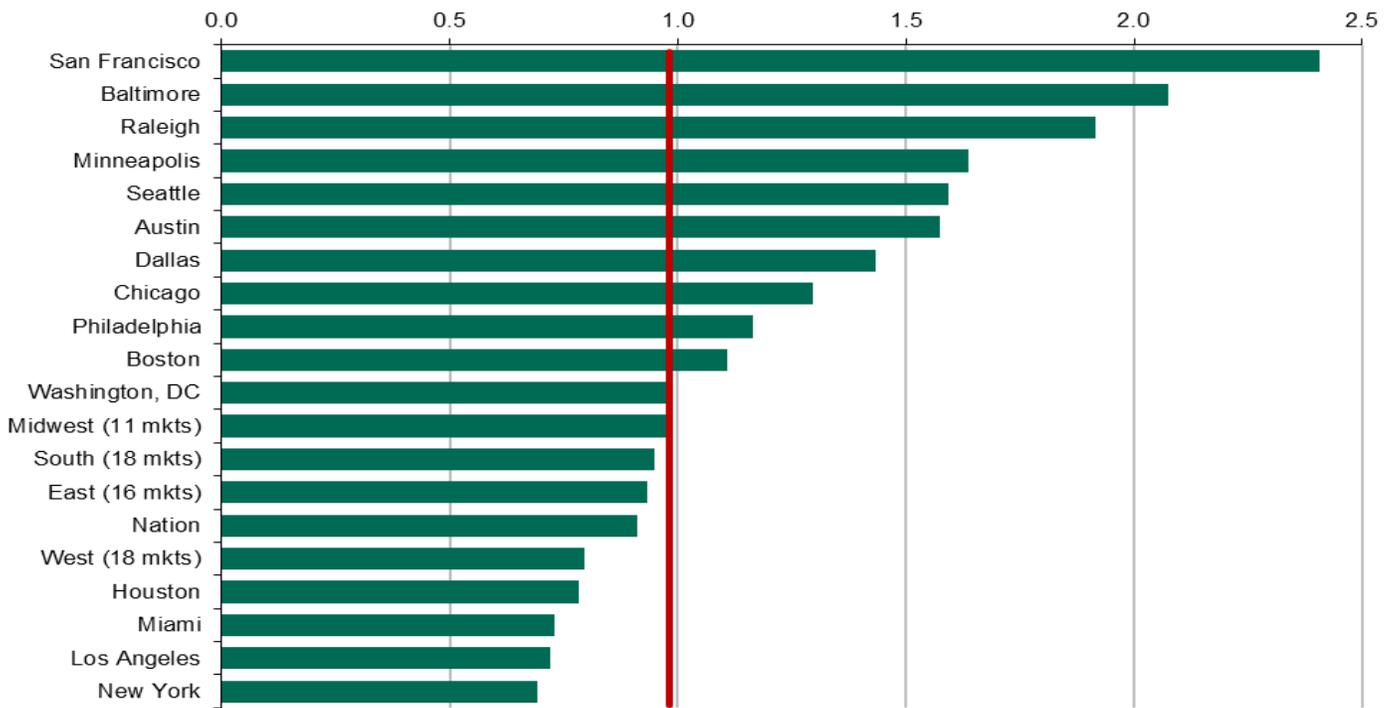
Source: Dodge/CBRE EA Pipeline, May 2012

Exhibit 30 - Ratio of Next 4 Quarters' Apartment Completions to 2000-2011 Avg.

	0.0	0.5	1.0	1.5	2.0	2.5
Raleigh						
Minneapolis						
Baltimore						
Austin						
San Francisco						
Boston						
Seattle						
Washington, DC						
Dallas						
East (16 mkts)						
Midwest (11 mkts)						
South (18 mkts)						
Nation						
Chicago						
Los Angeles						
West (18 mkts)						
Houston						
Philadelphia						
New York						
Miami						
Atlanta						
Phoenix						
Detroit						
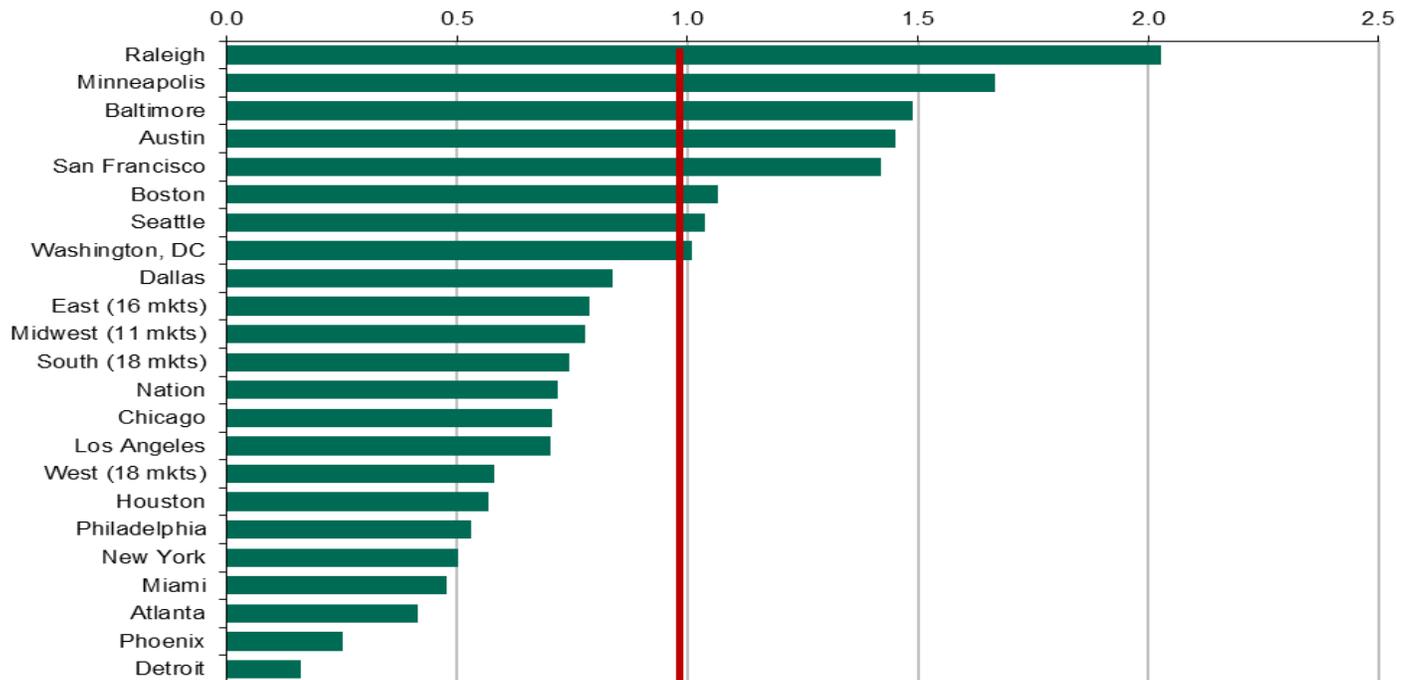
Source: Dodge/CBRE EA Pipeline, May 2012

The supply outlook beyond 2012 is closely tied to rent levels in real (inflation-adjusted) terms. In the severity of its real rent and new supply declines, the last downturn is somewhat analogous to the early 1990s, as can be seen in the chart below. One of the differences is that recovery in both is taking place faster this time. New supply in particular has fallen much more than it did in the early 1990s, and more than one would expect, considering where real rents have bottomed out. This was not due to real estate fundamentals, but rather to the credit freeze during the Great Recession—which included construction lending. Since rents fully recovered in nominal terms last fall, multi-housing starts have begun to pick up and are now on pace to reach their historical norms (in this case defined as the 1989-2008 average) by the end of 2012.

We expect rents to reach their historical average levels in real (inflation-adjusted) terms in 2013, and to continue growing at about 100 basis points above consumer inflation after that. New supply should also rise gradually as a result; the contrasting scenario of a sudden surge in multi-housing construction far above those sustainable levels would impact occupancy and rents. Some potential for such a surge does exist as there is currently more than 4 years of new supply in various stages of planning. The chart below shows that mixed-use, condominium, and other types of multi-housing product account for over half of this pipeline. It is also worth noting that 28% of 850,000 multi-housing units in planning is concentrated in 6 primary markets, which means it is unlikely that there will be a shortage of development sites even in the so-called "supply-constrained" markets—at least over the next 3-5 years.

Exhibit 31 -- More than 4 Years of New Supply in Various Stages of Planning
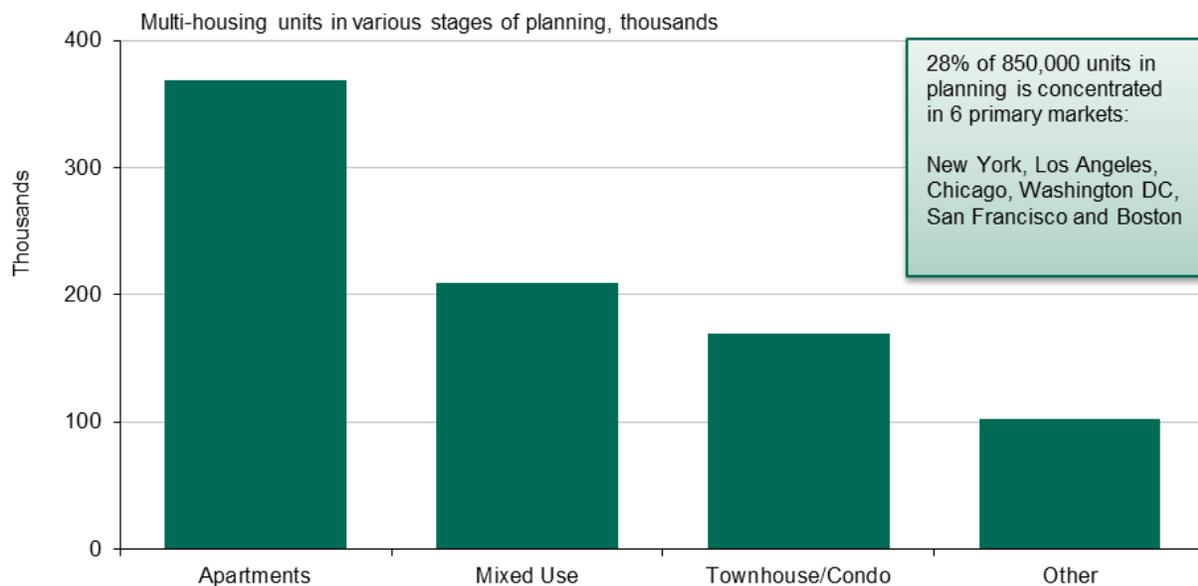
Source: Dodge/CBRE EA Pipeline, May 2012

Markets that are expected to have the highest completions rates in the next five years include Austin, Charlotte, Columbus, Raleigh, San Antonio, Orlando, Fort Worth, Miami, Dallas, and Denver; the slowest completion rates during this period are projected for Dayton, Providence, Las Vegas, Detroit, Cleveland, Hartford, Sacramento, Pittsburgh, and Tucson. As always, most of the future multi-housing construction volume will be concentrated in larger markets including New York, Houston, Dallas, Los Angeles, Atlanta, Washington DC, Seattle, Miami, Phoenix, and Chicago.

To properly determine whether we're building too much, though, one must not only consider the *total* number of units being supplied to markets in relation to their local household growth, but also whether it is the right mix of product to

meet that demand. One of the challenges facing multi-housing today is very rapid growth in demand relative to developers' capacity to meet it in the near term. This situation presents some great opportunities to investors, but also risks. For example, if most new supply is high-end/luxury product and most demand growth is at the lower end of the income spectrum, imbalances can quickly form in the market's various tiers. Furthermore, if available debt capital is constrained at the lower end of the spectrum, this could result in a growing shortage of affordable rental housing.

Understanding the demographics is essential to this analysis, as it sheds some light on the age and income profile of future demand growth. The chart below shows population growth by age group over the past three decades, along with the latest projections for 2010-2020. Three trends will be particularly relevant to housing market dynamics, the overall economy and real estate: growth in the population aged 25-34 ("echo boomers"), decline in the population aged 45-54, and the transition of "baby boomers" into the over-65 demographic.

Exhibit 32 – U.S. Total Population Growth by Age
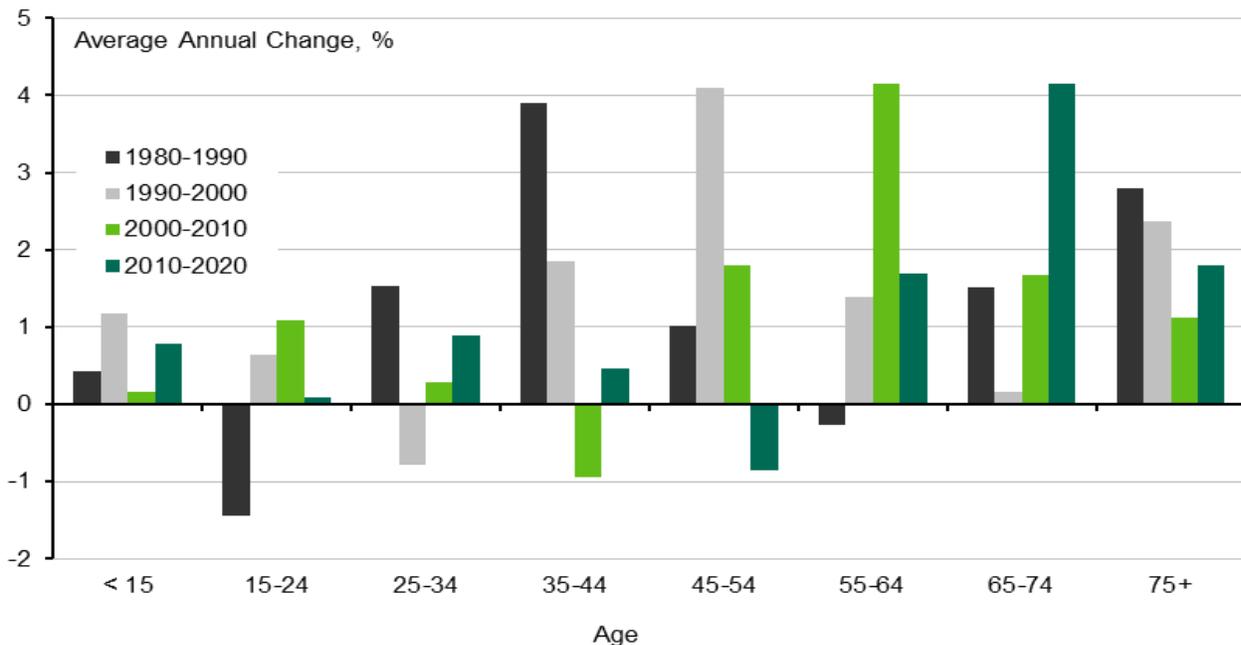
Sources: Bureau of the Census, CBRE EA

Changing age demographics will not only have a major impact on the composition of future housing demand and supply—in terms of both single-family versus multi-housing and for-sale versus for-rent—but also on income distribution and subsequently the price profile of the product. Let's take a closer look at these trends.

The latest projections indicate that, with housing demand closely following changes in population, seniors and the young will drive about 80% of future household growth, shown in the chart below. This should benefit the apartment sector greatly: the two groups account for nearly 60% of existing multi-housing demand (owner- and renter-occupied) but less than 40% of single-family.

Meanwhile, households aged 45-54 will likely be shrinking for the first time since the 1980s. This group was an important contributor to single-family demand growth for years, but since the housing bust it has been affected severely by foreclosures and bad credit. This cohort is smaller and financially weaker than it has been in the past—a headwind for the single-family segment.

Exhibit 33 – U.S. Total Household Growth by Age, 2010-2020
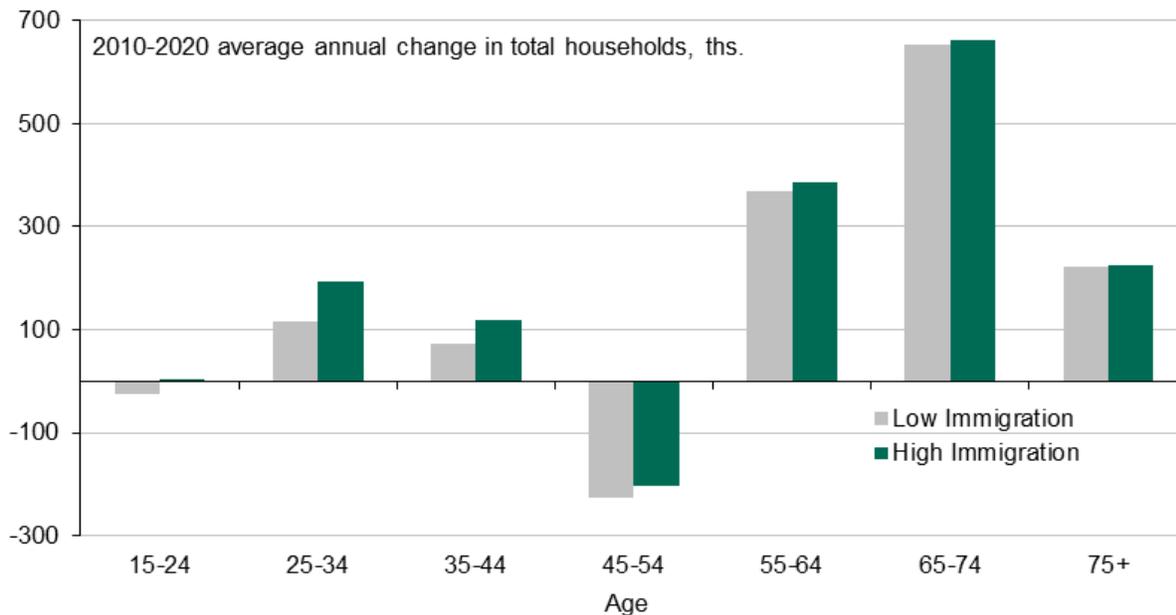
Source: Harvard University Joint Center for Housing Studies

Since seniors will account for most future household growth and also have the highest propensity to own homes, there will be stronger demand for units for sale than for rent, even if the age-specific homeownership rates drop. Seniors may like the lifestyle advantage that multi-housing offers over single-family, but they also seek stability and protection against annual rent increases. The introduction of long-term rental leases for seniors could go a long way toward bringing more seniors into the rental pool; until then, most of them are likely to own their units—including multi-housing.

Meanwhile, the sheer size of the aging "baby boomer" cohort is such that even with its relatively low propensity to rent, this group will yield more new renters in this decade than will the young. Senior renters prefer multi-housing to single-family, which means that much of the new rental apartment product has to be designed to meet the demands of the elderly.

These demographic trends also carry two implications for the income profile of future housing demand. First, seniors and the young have lower incomes than the middle-aged groups (see the chart below), which means that the incomes of new households will not be as high as they have been over the past three decades. Second, among seniors and the young, income is less evenly distributed than it is among the middle-aged, which suggests that the shares of new demand concentrated at the top and bottom of the income spectrum will be higher than they were in the past. Saying it another way, the shrinking share of the middle-aged among the overall population during this decade will contribute to the shrinking of the middle class. The overall impact on housing demand growth will be two-fold: while the bulk of it will be concentrated in the lower end of the price spectrum, the share of high-end product will be higher than in the past.

Exhibit 34 -   Income by Age of Household
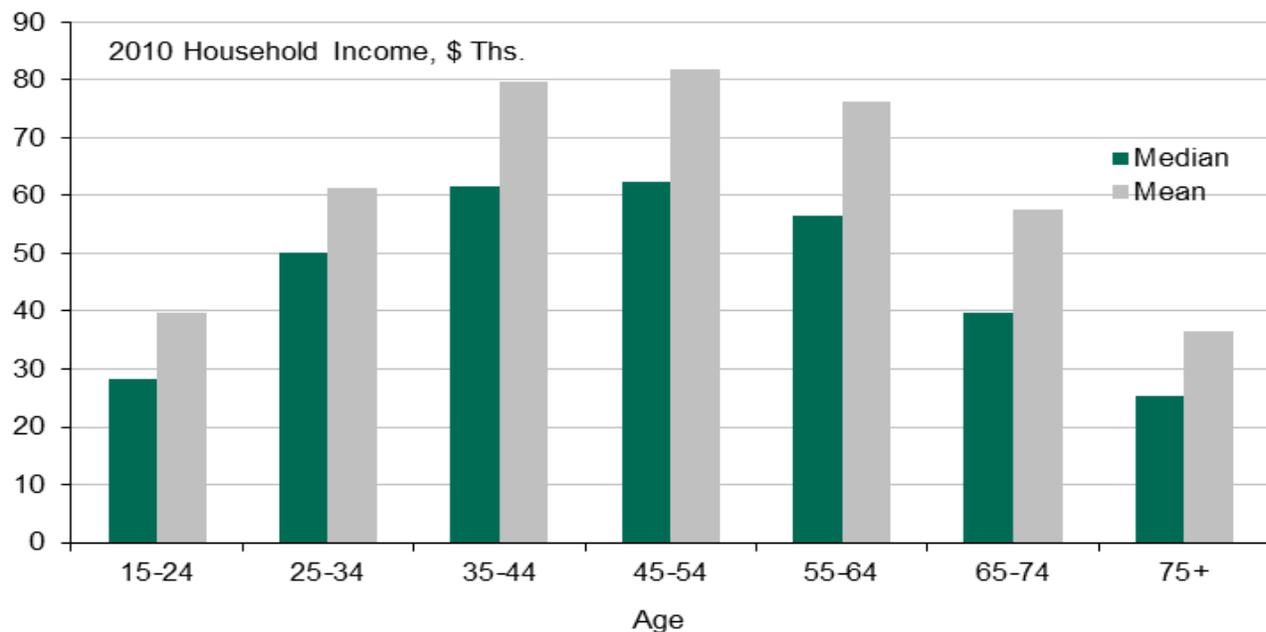

Source: 2010 Current Population Survey

The income distributions of seniors and the young help put this in perspective. About two-thirds of these households earn less than $50K a year and 12% have incomes greater than $100K. In a scenario where multi-housing demand stabilizes near its long-term trend of 250,000 units, high-end product should amount to about 30,000—including units for rent and for sale. If most recent multi-housing development is and continues to be high-end product, this will soon become cause for concern. The multi-housing outlook is strong—assuming that developers do their due diligence and build the right product to meet the new demand.

Rent and Revenue Trends

The national same-store effective rent index increased at an annualized rate of 4.6% in Q2 2012—down slightly from the first quarter's 4.8% growth pace. As in the prior quarter, improvement was broad-based, with all markets except for Las Vegas reporting quarterly rent growth. Compared to a year ago, the strongest growth (above 5%) in the same-store effective rent index was reported in San Francisco, San Jose, Oakland, Boston, Austin, New York, Charlotte, Denver, Pittsburgh, Hartford, Edison, Chicago, and Seattle. Markets with the slowest growth (less than 2.5%) included Las Vegas, Norfolk, Tucson, Greensboro, Phoenix, Albuquerque, St. Louis, Atlanta, Birmingham, and El Paso.

The Sum of Markets' revenue or economic rent (effective rent times occupancy) now stands 4.6% above its pre-downturn level, led by markets such as Washington DC, Boston, New York, San Francisco, San Jose, New York, Chicago, Denver, and Miami. Large markets whose revenues remain below pre-downturn levels include Phoenix, Atlanta, Los Angeles, and Seattle. Meanwhile, El Paso, Pittsburgh, Louisville, Columbus, Oklahoma City, Hartford, Minneapolis, Cleveland, and Cincinnati are smaller markets where revenues are at least 6% *above* their pre-downturn levels. Smaller markets with revenues that are at least 5% below their pre-downturn levels include Tucson, Jacksonville, Ventura, and Las Vegas.

Exhibit 35 – Rent Growth Slows Down in Most Markets

Annualized Same-Store Rent Growth, %
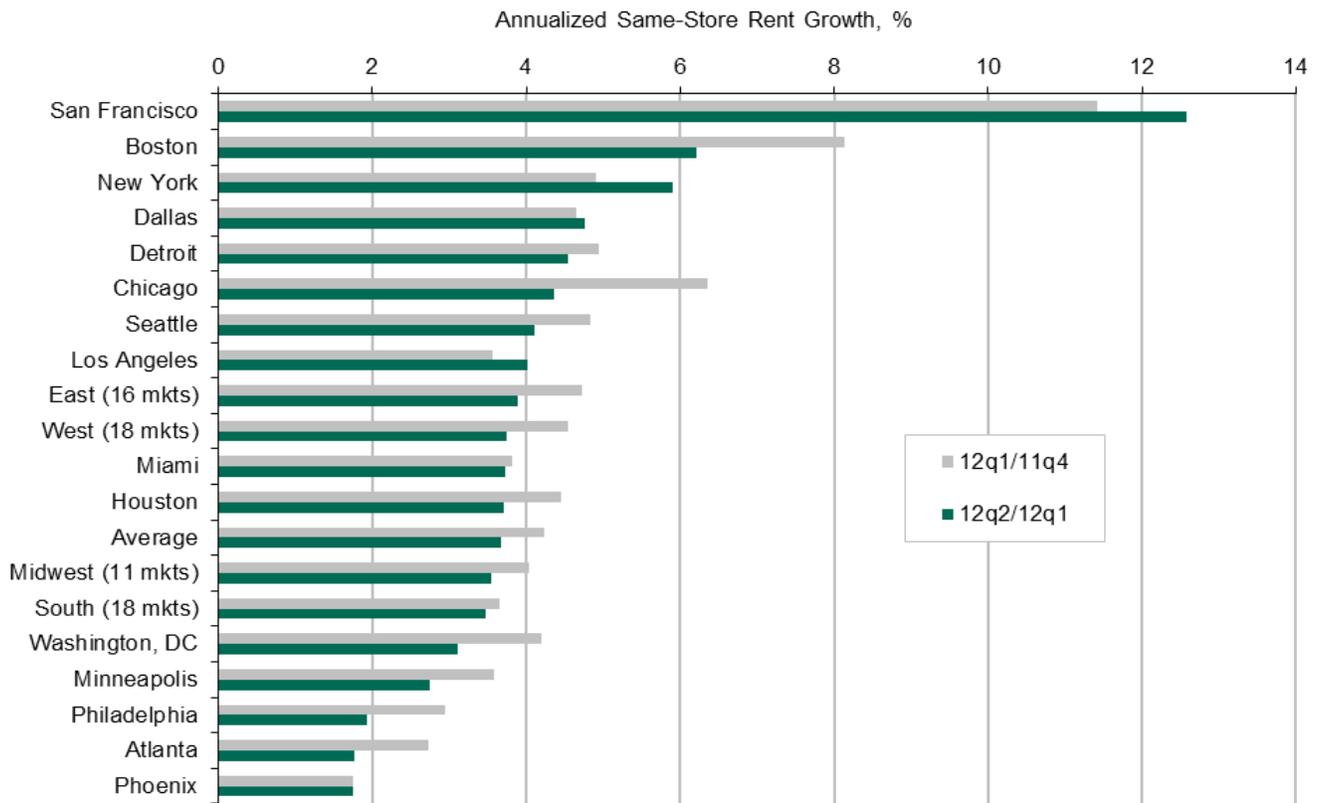
Source: MPF/CBRE-EA Multi-Housing Outlook, 2012q2

As a result of stronger demand and occupancy, a number of markets should still see stronger rent growth in 2012 than in 2011; these include Las Vegas, Orlando, Salt Lake City, Austin, Houston, San Antonio, Denver, Atlanta, Dallas, San Diego, and Sacramento, and Norfolk, among others. Next year, we expect to find the strongest rent growth in San Francisco, San Jose, Austin, Denver, Boston, Minneapolis, Seattle, and Portland—markets with strong high-tech sectors that will help drive their labor market recoveries and sustain their strong performance.

Beyond the short-term horizon, apartment rent and revenue growth will be facing two headwinds—the inevitable increase in new supply, and some slowdown in demand growth due to the loss of some existing and potential tenants to home ownership. The current costs of buying a median-priced single-family home or condominium relative to apartment rents do vary dramatically across markets and submarkets, as the tables below indicate. For example, the current cost of buying a median-priced single-family home in San Jose is almost 70% higher than apartment rents there, while in Atlanta the cost of buying is almost 40% lower than apartment rents.

While this is a good illustration of the wide variation in current costs of buying vs. renting across the United States, it says nothing about whether now is a good time to buy or rent in San Jose or Atlanta. When it comes to how much median-priced home a median-income household can currently afford, buying a home in any market now represents the best opportunity in a generation. It is possible that the weak owner demand has to do not only with the continuing foreclosures and lack of confidence in the economy and the housing market (which will be restored as the recovery continues) but also with a shift in preference from owning toward renting as a lifestyle choice, which would have a more lasting effect on the composition of future demand and supply.

Exhibit 36 - Potential Loss of Renters to Single-Family Home Purchase Varies Greatly Across Markets

Metro Name	Median SF Price, $ Ths.			Cost of Buying $/Month*			Apartment Rent $/Month			Own Premium or Discount, %	
	12q2	11q2	% Ch	12q2	11q2	% Ch	12q2	11q2	% Ch	12q2	11q2
San Jose	660.0	600.0	10.0	3,189	2,899	10.0	1,905	1,698	12.1	67.4	70.7
Newark	385.7	374.9	2.9	1,863	1,811	2.9	1,372	1,315	4.3	35.8	37.7
Denver	260.7	232.7	12.0	1,260	1,124	12.0	948	893	6.1	32.9	25.8
Seattle	290.7	287.2	1.2	1,404	1,388	1.2	1,065	1,014	5.0	31.8	36.8
San Diego	379.1	379.3	-0.1	1,832	1,833	-0.1	1,395	1,360	2.6	31.2	34.7
Portland	233.9	220.1	6.3	1,130	1,063	6.3	913	870	4.9	23.8	22.2
Edison	297.5	328.6	-9.5	1,437	1,588	-9.5	1,203	1,142	5.4	19.4	39.0
Albuquerque	174.3	166.8	4.5	842	806	4.5	714	698	2.4	17.9	15.5
Washington, DC	367.0	340.9	7.7	1,773	1,647	7.7	1,513	1,453	4.1	17.2	13.3
San Francisco	552.6	513.2	7.7	2,670	2,479	7.7	2,298	2,035	12.9	16.2	21.8
Tucson	147.8	136.5	8.3	714	659	8.3	639	630	1.3	11.8	4.6
Austin	214.9	199.3	7.8	1,038	963	7.8	940	881	6.7	10.5	9.3
Tulsa	136.5	130.7	4.4	659	631	4.4	603	587	2.6	9.4	7.5
Baltimore	255.0	234.7	8.6	1,232	1,134	8.6	1,146	1,111	3.1	7.5	2.1
Boston	362.1	355.7	1.8	1,749	1,719	1.8	1,648	1,541	7.0	6.2	11.6
Greenville	152.3	146.5	4.0	736	708	4.0	717	686	4.6	2.6	3.2
San Antonio	162.8	153.2	6.3	787	740	6.3	777	746	4.1	1.2	-0.8
Norfolk	195.0	184.9	5.4	942	893	5.4	932	922	1.0	1.1	-3.1
Phoenix	148.4	115.0	29.0	717	556	29.0	737	720	2.3	-2.7	-22.9
Houston	168.3	156.5	7.5	813	756	7.5	852	821	3.8	-4.6	-7.9
Hartford	226.3	236.8	-4.4	1,093	1,144	-4.4	1,149	1,087	5.7	-4.8	5.2
Kansas City	148.4	137.0	8.3	717	662	8.3	756	731	3.4	-5.2	-9.5
Dallas	163.0	151.5	7.6	788	732	7.6	839	802	4.6	-6.1	-8.8
Indianapolis	135.1	127.2	6.2	653	615	6.2	696	672	3.5	-6.2	-8.6
Louisville	139.6	129.9	7.5	674	628	7.5	723	694	4.1	-6.7	-9.6
Philadelphia	219.7	215.1	2.1	1,061	1,039	2.1	1,137	1,104	3.1	-6.7	-5.8
Greensboro	127.8	129.8	-1.5	617	627	-1.5	677	666	1.6	-8.8	-5.9
Columbus	142.1	130.9	8.6	687	632	8.6	759	726	4.6	-9.6	-12.9
El Paso	135.0	132.5	1.9	652	640	1.9	728	711	2.4	-10.5	-10.0
Cincinnati	135.4	127.3	6.4	654	615	6.4	733	712	3.0	-10.7	-13.6
Los Angeles	296.8	292.3	1.5	1,434	1,412	1.5	1,619	1,555	4.1	-11.4	-9.2
Providence	217.5	224.8	-3.2	1,051	1,086	-3.2	1,188	1,135	4.7	-11.6	-4.3
Sacramento	170.2	166.5	2.2	822	804	2.2	934	909	2.7	-12.0	-11.5
Miami	206.7	186.3	11.0	999	900	11.0	1,145	1,105	3.7	-12.8	-18.5
Las Vegas	130.7	126.2	3.6	631	610	3.6	733	737	-0.5	-13.8	-17.2
New York	429.9	448.7	-4.2	2,077	2,168	-4.2	2,413	2,274	6.1	-13.9	-4.7
Minneapolis	174.5	157.3	10.9	843	760	10.9	986	944	4.5	-14.5	-19.5
St. Louis	134.7	129.0	4.4	651	623	4.4	765	747	2.4	-14.9	-16.6
Memphis	123.5	112.6	9.7	597	544	9.7	721	698	3.4	-17.3	-22.0
Riverside	183.0	171.5	6.7	884	829	6.7	1,080	1,052	2.7	-18.1	-21.3
Jacksonville	133.0	134.2	-0.9	643	648	-0.9	785	764	2.8	-18.2	-15.2
Tampa	144.3	129.6	11.3	697	626	11.3	859	837	2.7	-18.9	-25.2
Chicago	187.7	183.2	2.5	907	885	2.5	1,199	1,139	5.3	-24.4	-22.3
Orlando	136.1	125.6	8.4	658	607	8.4	872	843	3.4	-24.6	-28.0
Cleveland	103.9	108.5	-4.2	502	524	-4.2	787	761	3.4	-36.2	-31.2
Atlanta	103.2	102.1	1.1	499	493	1.1	815	796	2.4	-38.8	-38.0
Average of 46 markets	**217.2**	**208.1**	**4.4**	**1,050**	**1,005**	**4.4**	**1,031**	**985**	**4.6**	**1.8**	**2.0**

* assumes 5% 30-year fixed mortgage rate and 10% down payment

Sources: NAR, MPF Research, CBRE EA

Exhibit 37 - Potential Loss of Renters to Condominium Purchase Varies Greatly Across Markets

Metro Name	Median Condo Price, $ Ths.			Cost of Buying $/Month*			Apartment Rent $/Month			Own Premium or Discount, %	
	12q2	11q2	% Ch	12q2	11q2	% Ch	12q2	11q2	% Ch	12q2	11q2
Newark	277.9	261.4	6.3	1,888	1,776	6.3	1,372	1,315	4.3	37.7	35.0
Austin	185.4	174.0	6.6	1,260	1,182	6.6	940	881	6.7	34.1	34.3
Boston	322.8	311.8	3.5	2,193	2,119	3.5	1,648	1,541	7.0	33.1	37.5
Edison	232.3	248.9	-6.7	1,578	1,691	-6.7	1,203	1,142	5.4	31.2	48.1
Norfolk	167.3	172.8	-3.2	1,136	1,174	-3.2	932	922	1.0	22.0	27.3
Dallas	146.2	131.5	11.2	993	893	11.2	839	802	4.6	18.4	11.4
Washington, DC	261.6	234.3	11.7	1,777	1,592	11.7	1,513	1,453	4.1	17.5	9.5
Indianapolis	118.5	122.5	-3.3	805	832	-3.3	696	672	3.5	15.8	23.8
Louisville	120.2	121.3	-0.9	817	824	-0.9	723	694	4.1	13.0	18.8
Portland	151.1	152.4	-0.9	1,027	1,035	-0.9	913	870	4.9	12.5	19.0
San Francisco	379.1	359.9	5.3	2,576	2,445	5.3	2,298	2,035	12.9	12.1	20.2
Baltimore	188.6	185.3	1.8	1,281	1,259	1.8	1,146	1,111	3.1	11.9	13.4
Tucson	104.4	96.4	8.3	709	655	8.3	639	630	1.3	11.0	3.9
Houston	138.3	129.2	7.0	940	878	7.0	852	821	3.8	10.3	6.9
San Diego	224.2	214.9	4.3	1,523	1,460	4.3	1,395	1,360	2.6	9.2	7.3
Philadelphia	175.7	183.7	-4.4	1,194	1,248	-4.4	1,137	1,104	3.1	5.0	13.1
Columbus	113.4	106.2	6.8	771	722	6.8	759	726	4.6	1.5	-0.6
Los Angeles	228.2	244.9	-6.8	1,551	1,664	-6.8	1,619	1,555	4.1	-4.2	7.0
Cincinnati	102.2	110.2	-7.3	694	749	-7.3	733	712	3.0	-5.2	5.2
Hartford	152.7	169.9	-10.1	1,038	1,154	-10.1	1,149	1,087	5.7	-9.7	6.2
Phoenix	86.8	67.7	28.2	590	460	28.2	737	720	2.3	-20.0	-36.1
Chicago	140.3	145.4	-3.5	953	988	-3.5	1,199	1,139	5.3	-20.5	-13.3
New York	244.5	242.1	1.0	1,661	1,645	1.0	2,413	2,274	6.1	-31.2	-27.7
Jacksonville	77.2	67.2	14.9	525	457	14.9	785	764	2.8	-33.2	-40.3
Tampa	79.9	74.1	7.8	543	503	7.8	859	837	2.7	-36.8	-39.8
Miami	104.4	85.9	21.5	709	584	21.5	1,145	1,105	3.7	-38.1	-47.2
Sacramento	81.5	80.9	0.7	554	550	0.7	934	909	2.7	-40.7	-39.6
Las Vegas	59.8	52.2	14.6	406	355	14.6	733	737	-0.5	-44.5	-51.9
Atlanta	50.0	38.7	29.2	340	263	29.2	815	796	2.4	-58.3	-66.9
Average of 29 markets	**162.6**	**158.1**	**2.8**	**1,105**	**1,074**	**2.8**	**1,108**	**1,059**	**4.6**	**-0.3**	**1.4**

* assumes 5% 30-year fixed mortgage rate, 20% down payment, and 3% in additional fees/costs

Sources: NAR, MPF Research, CBRE EA

The U.S. condominium market has weakened slightly in Q2 2012. Existing condominium sales edged down from about 520,000 units (annualized rate) in Q1 2012 to 503,000 units in Q2 2012. At the same time, inventory for sale was up from 288,000 units to 292,000 units, and this pushed sales duration from 6.7 to 7 months. The market is notably stronger than it was a year ago, however, with both sales and median sale prices rising.

The Outlook

Across the sum of 60 markets in CBRE-EA's market coverage, total employment gained 905,000 jobs in 2011 and the forecast calls for 882,000 more jobs added in 2012. While job growth is expected to be about the same this year as last year, rentable completions will more than double—from 53,000 in 2011 to 125,000 units in 2012. With the average vacancy rate below the historical norm and effective rents at a peak level and rising, the combination of moderate improvement in job growth and rapid increases in new supply will lead to slower net absorption: 84,000 units in 2012 compared with 164,000 in 2011. As job growth accelerates to 1.63 million in 2013 and growth in new supply slows down, net absorption should pick up again and average about 177,000 units per year over the next 5 years.

Exhibit 38 – Multi-Housing Vacancy Rate to Remain Stable
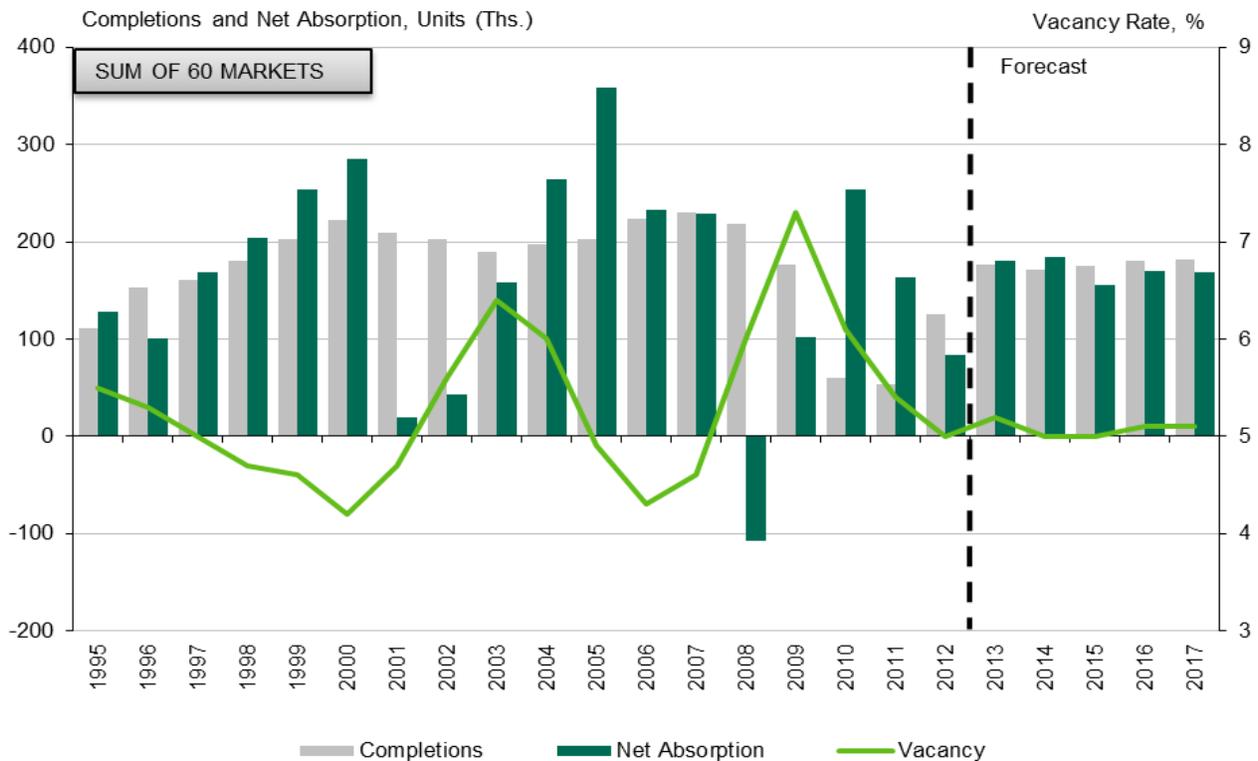
Source: MPF/CBRE-EA Multi-Housing Outlook, 2012q2

The demographics of rental demand—including rapid growth in households under the age of 34 and those aged 65 and over—will keep apartment fundamentals strong beyond the immediate horizon. Assuming continuing recovery in employment and home prices, growth in apartment demand should be sufficient to keep vacancy rates stable—as long as new construction increases gradually. Although apartment rent and revenues are expected to grow above consumer inflation and above their historical rates over the next five years, they will still only be returning to a long-term norm in real (inflation-adjusted) rent level, and it is these long-term average real rent levels that have the greatest impact on new construction. This said, if the homeownership rate continues its downward trend for several more years, the accompanying own-to-rent conversions may affect long-term performance in some areas, including highly affordable single-family markets where overall residential vacancy is high.

We expect apartment revenue growth to average 3.2% per year over the next five years, with better performance in markets such as Phoenix, Atlanta, Austin, and San Francisco. To evaluate the best investment opportunities in multi-housing for the next five years, it is not enough to look at the strongest revenue growth alone; it is also important to compare projected revenue levels to markets' historical norms. For example, despite current moderate—or, in some cases, lagging—revenue growth, in five years markets such as New York, Washington DC, Baltimore, Boston, or Miami will see their revenue levels higher in comparison to their long-term averages than some fast-growing markets. This is mainly due to revenue levels in these markets are today—they have either declined less during the downturn or have been able to recover most of the losses over the last year or so.

There is and will be wide variation in fundamentals across markets, submarkets, and types of apartment assets. The South and West regions of the country are expected to lead growth in jobs, population, households, and subsequently apartment demand, but this also means faster growth in new supply. Housing affordability will be a constraining factor for demand as rents rise quickly and home prices fall further. At the same time, based on historical evidence, it would also be reasonable to expect that a prolonged dramatic decline in owner demand and home prices would trigger millions more own-to-rent conversions.

Exhibit 39 – 2012q2 Multi-Housing Outlook: Sum of 60 Markets

Year	Total Employment (Thousands)	Population (Thousands)	Real Personal Income ($ billions)	Rentable Stock (Units)	Rentable Completions (Units)	Net Absorption (Units)	Vacancy Rate (Percent)	Same-Store Rent Index ($/Unit per Month)	Rent Inflation (Percent)
1994	63,137.10	137,922.40	5,285.30	11,454,117	71,752	131,896	5.20	820.72	2.90
1995	64,672.00	139,794.70	5,423.10	11,564,506	110,389	127,803	5.50	845.99	3.10
1996	66,427.40	141,820.20	5,628.80	11,717,226	152,720	99,933	5.30	876.48	3.60
1997	68,542.10	143,956.40	5,904.30	11,878,554	161,328	168,753	5.00	908.33	3.60
1998	70,469.80	146,108.20	6,292.80	12,059,091	180,537	204,364	4.70	944.59	4.00
1999	72,344.60	148,234.40	6,524.90	12,262,178	203,087	253,224	4.60	975.48	3.30
2000	74,013.80	150,296.90	6,810.10	12,484,112	221,934	284,534	4.20	1,041.38	6.80
2001	72,934.40	152,119.90	6,783.80	12,693,768	209,656	19,681	4.70	1,073.48	3.10
2002	72,633.90	153,628.50	6,803.30	12,896,664	202,896	43,040	5.60	1,071.55	-0.20
2003	72,483.30	155,108.00	6,978.40	13,086,603	189,939	158,611	6.40	1,074.09	0.20
2004	73,799.10	156,649.70	7,246.90	13,284,295	197,692	264,578	6.00	1,094.98	1.90
2005	75,240.30	158,510.20	7,374.70	13,486,494	202,199	357,978	4.90	1,134.99	3.70
2006	76,602.80	160,149.50	7,767.80	13,709,667	223,173	232,907	4.30	1,185.76	4.50
2007	77,403.90	161,868.00	7,852.10	13,939,916	230,249	229,451	4.60	1,225.25	3.30
2008	75,959.00	163,673.00	7,826.20	14,158,917	219,001	-107,369	6.00	1,246.09	1.70
2009	72,474.20	165,381.50	7,431.80	14,336,019	177,102	102,189	7.30	1,187.90	-4.70
2010	73,150.20	167,027.40	7,724.60	14,395,360	59,341	253,070	6.10	1,205.12	1.40
2011	74,054.70	168,706.10	7,838.80	14,448,446	53,086	163,870	5.40	1,264.10	4.90
2012	74,936.30	170,541.40	8,058.10	14,573,635	125,189	83,720	5.00	1,318.07	4.30
2013	76,563.40	172,481.40	8,414.10	14,749,559	175,933	180,215	5.20	1,356.91	2.90
2014	77,966.50	174,450.20	8,656.30	14,920,508	170,945	183,930	5.00	1,405.54	3.60
2015	79,002.20	176,454.70	8,830.10	15,095,794	175,293	155,599	5.00	1,454.41	3.50
2016	80,063.00	178,511.60	9,033.50	15,275,666	179,873	169,290	5.10	1,497.23	2.90
2017	81,035.20	180,577.40	9,194.30	15,457,922	182,263	168,600	5.10	1,542.98	3.10

Source: MPF/CBRE-EA Multi-Housing Outlook, 2012q2

Of course, much will also depend on mortgage rates, the availability of credit, and how lasting this change in attitudes towards homeownership—on the parts of households and policymakers alike—will be. In two or three years, preferences might be less about owning versus renting than about what *type* of home people want to live in—whether as buyers or renters. For example, increasing numbers of younger and older people are deciding to live in multi-family, rather than in single-family, homes. As the market recovers, these differences—across locations but also across various home types—will also become more pronounced.

Part 2 – Nature of the Multi-Housing Business Model

Overview

Over the past three decades, the business of multi-housing ownership and finance has changed dramatically. The business model has evolved from one that primarily involved local ownership and financing to one that increasingly involves global capital for ownership and financing, and which deploys increasingly sophisticated financial structures and strategies.

There are two principal developments have allowed the multi-housing sector to gain increasing liquidity and acceptance as a stable asset class. First, after the period of overbuilding in the late 1980s, the multi-housing sector gained favor among institutional investors and Real Estate Investment Trusts (REITs). In addition, the development of the Low-Income Housing Tax Credit (LIHTC) program brought a large sector of the multi-family housing market into prominence due to the syndication of tax credits to large financial institutions and other tax-driven investors. This also marked a shift in the federal government's strategy for providing affordable housing – instead of developing the majority of public housing directly or through subsidy, it sought to attract private capital to develop housing through the use of tax credit incentives.

On the financing side, the principal development that has allowed the multi-housing sector to gain a high degree of liquidity has been the evolution of secondary markets. While the single-family owner market benefited from the evolution of mortgage pass-through securities in the 1970s, the multi-housing rental market was somewhat slower to evolve to a point where secondary markets dominate lending. This reflects the fact that multi-housing properties are generally larger, require more financing, and are less homogeneous than their single-family counterparts. Furthermore, multi-housing properties can also vary significantly in terms of size and location market and tenant profile. Credit underwriting and deal structuring are often more complex than under single-family lending, requiring higher costs and the evaluation of unique credit risks.   However, with the development of securitization sponsored by the Resolution Trust Company (RTC) in response to distress in the banking sector during the early 1990s, securitization and the secondary market evolved rapidly.

After the market crash in the early 1990s that followed the period of overbuilding and tax law changes of the mid-1980s, ownership of multi-housing housing began to change significantly.   Out of scores of failed syndicated partnerships that fueled the multi-housing housing development boom in the 1980s, arose increasing sophisticated ownership models that emphasized increased scale, stronger property management and financial oversight.   The recovery in market-rate apartments was bolster by growth in apartment REITs, which acquired distressed properties at low costs following the recession; as the market generally stabilized and performance improved during the 1990s, institutional investors were gradually drawn into the sector.   According to the National Council of Real Estate Investment Fiduciaries (NCREIF), the number of apartment units held in institutional portfolios increased from near 50,000 in 1990, to more than 200,000 units by 2000; as of mid-2012 the number of units mushroomed to 465,000 units.[27]   At the same time, tax credit syndication of limited partnerships related the LIHTC program consolidated the administration and management of a large segment of low income housing. As of 2007, over 1.5 million units were in placed in service under program.[28]

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[27] Source: NCREIF Property Research Database, at www.ncreif.org. Data as of 2012Q2.
[28] See Schwartz (2010) p. 9. The number of estimated LIHTC units in service exceeds the stock of public housing, which is estimated at 1.16 million units.

While there are several measurement issues related to determining ownership profile for multi-housing rental housing, Exhibit 40 below shows the distribution rental housing ownership by unit size.[29] The exhibit shows that individuals own the vast majority of smaller apartment buildings – almost 85% - in the 2-4 unit category.   Ownership by REITS, partnerships, and other corporate owners increases substantially with larger complexes.   Over 62% of large properties carried these types of owners – among those 50+ unit properties where the type of ownership was clearly reported.

With larger capitalized entities controlling a much larger share of these properties, this segment of the market may benefit from larger economies of scale, reduced risk profiles, and the ability to tap broader sources of mortgage and unsecured financing. According to a list of the largest apartment property owners compiled by the National Multi-Housing Council, the 50 largest owners had in interest in over 3 million units in 2012, an estimated 17% of the apartment stock.   Among the largest owners were ten publicly traded REITS, including Equity Residential, Aimco, Camden Property Trust, UDR, Inc., and AvalonBay Communities, Inc.[30]

Exhibit 40 – Who Owns the Nation's Apartments

	All Properties	2-4 unit Properties	5-49 unit Properties	50+ unit Properties
Individuals	46.9%	84.8%	57.4%	19.2%
Partnerships	20.3%	3.9%	14.9%	32.7%
Real Estate Investment Trusts	2.1%	0.6%	1.1%	3.4%
Real Estate Corporations	5.8%	1.0%	4.0%	9.6%
Other Corporations	3.4%	0.9%	4.0%	4.6%
Non-Profits/Co-Ops	3.7%	0.6%	2.5%	6.0%
Other	4.4%	3.7%	4.6%	4.9%
Not Reported	13.4%	4.5%	11.5%	19.6%
TOTAL	100.0%	100.0%	100.0%	100.0%

Source: National Multi-Housing Council.   Reflects tabulations of unpublished data from the U.S. Census Bureau's 1995-96 Property Owners and Managers Survey.

Like the ownership of rental apartments, multi-housing lending has undergone rapid changes in recent years. Securitization and CMBS structures brought the secondary finance market into prominence during the 1990s, while the GSEs guarantee of repayment of principal combined to foster lender competition and lower costs of capital to the multi-housing sector. However, with the growing influence of public market securitization and secondary markets, the multi-housing sector has become more exposed to interest rate and credit risk volatility.

Instead of securing a loan from a thrift, which was common during the 1970s, borrowers now have access to a much broader source of real estate capital, which is often sourced on a global basis.   As a result, the pricing of multi-housing capital is more sensitive to trends in the broader credit market, which at times may react dramatically to macroeconomic factors and changing capital market conditions. In the next section, we briefly examine the recent evolution of the multi-housing financing business.

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[29]See National Multi-Housing Council, "Who Owns the Nation's Apartments" at   http://www.nmhc.org/Content.cfm?ItemNumber=55497
[30] See National Multi-Housing Council, "2012 NMHC 50" available at http://www.nmhc.org/files/ContentFiles/General/Newesttop50.pdf

Recent Evolution of Multi-housing Lending

Throughout the 1970s and 1980s, banks and savings institutions were the primary providers of mortgage capital to the multi-housing sector. During this time frame, banks and savings institutions accounted for almost one-half of multi-housing mortgage lending, while life insurance companies were also another significant source of capital. State and local housing agencies also provided debt for affordable housing projects.

The industry began to change dramatically during the beginning of the 1980s during a period of very high interest rates. Savings and loan institutions were deregulated in 1980 under the Depository Institutions Deregulation and Monetary Control Act, which spurred a flurry of lending in both single-family and multi-housing markets. Furthermore, changes in the tax code allowed individuals to shelter income through rental property, which spurred the period of rapid property acquisitions and new construction.

The Tax Reform Act of 1986 sharply curtailed the tax benefits from depreciation and investment in rental housing, precipitating a collapse in new construction. Commercial and multi-housing loan defaults increased rapidly, threatening the solvency of scores of smaller savings-and-loan institutions. In response the resulting crisis, which evolved during the late 1980s early 1990s, the federal government enacted a number of regulations that restricted banks and savings and loans ability to finance multi-housing property. In particular, the Financial Institutions, Reform, Recovery and Enforcement Act of 1989 (FIRREA) had broad implications for the evolution of multi-housing mortgage finance.

The Act introduced risk-based capital standards for savings and loan institutions. The legislation required that thrifts hold nearly double the capital requirement for multi-family mortgages than for single-family mortgages. As a result, multi-housing lending was curtailed, and thrifts began to lower their multi-housing mortgage holdings sharply.

Due to the fallout from excessive construction in the multi-housing sector, the Act also prohibited thrifts from providing construction and development loans where the loan amount exceeded 70% of the property's value. In particular, this severely restricted loan availability in some regions of the country.[31]   Thrifts were also prohibited from investing in real estate.

With the savings and loan institutions essentially on the sidelines, new players were able to enter the market and pick up origination volume. These included larger banks, life insurance companies, and the agencies, which establish new programs and lending networks to target multi-housing. Furthermore, as a part of the workout plan to dispose of distressed assets of the savings and loan institutions, the Resolution Trust Company, (RTC) began to securitize commercial and multi-housing loans. The evolution of technology and standardized securitization practices allowed for the development of broader securitization initiatives by private Wall Street issuers, and the agencies.

During the 2000's, the rapid growth in financial disintermediation allowed for the development of highly segmented risk and loss distribution through the financial sector. Private issuers created loans with highly leveraged structures, which often involved several sources of capital. These "tranched" structures often involved senior securitized loans, combined with subordinate B-notes or mezzanine loans.   The subordinate or mezzanine loans were often placed with specialized finance companies or fund managers, who in turn financed their holdings through the use of collateralized debt obligations (CDO's). This allowed sharp growth in debt on higher leveraged properties by private CMBS issuers and other lenders. As a result, multi-housing debt held by private CMBS issuers jumped to 16% in 2007 from just over 12% in 2000.

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[31] DiPasquale, D., and J. L. Cummings, 1992. "Financing Multifamily Rental Housing: the Changing Role of Lenders and Investors", *Housing Policy Debate*, 3, 1:77 – 117.

During the 2000's, secondary markets gained prominence, led by private CMBS issuers and the agencies, at the expense of traditional portfolio lenders such as banks and life insurance companies. The decade witnessed a very rapid growth and multi-housing debt outstanding, reflecting increasingly aggressive loan underwriting standards (accompanied higher loan-to-value ratios and diminished borrower equity requirements), which in turn supported dramatic appreciation in property values. Total multi-housing debt outstanding mushroomed to over $784 billion in 2007 from just over $400 billion at the beginning of the decade. Multi-housing debt held by private CMBS issuers jumped to 16% in 2007 from just over 12% in 2000. Meanwhile, banks, and to a much lesser degree, specialty finance companies, continued to provide the bulk of construction financing for new apartment and condominium developments.

In general, private CMBS issuers tended to originate loans on lower quality properties in secondary markets. Through structured finance, the issuers were able to grant higher loan proceeds at favorable rates to borrowers as the investor demand for CMBS securities rose, which in caused bond spreads and lending rates to fall in a "virtuous" cycle.   In addition, the rating agencies lowered required subordination levels for highly rated securities, reducing the overall weighted costs of funding CMBS loans. Multi-housing developments were often viewed by the rating agencies as a stable property type, which provided strong diversification benefits to CMBS securitization pools and thereby reduced subordination requirements.   As a result, CMBS issuers often bid aggressively on multi-housing financing, offering lower credit spreads and higher loan proceeds.

In general, underwriting standards and terms on CMBS loans differed from those on bank, life company, and agency originations. During the peak level of activity during the mid-2000s, CMBS issuers often offered loan terms of up to 80% loan-to-value (LTV) or more, with either partial or full-term interest only payments on five- to ten-year fixed-rate balloon loans. Traditionally, higher leverage loans offered by banks and life companies often topped out at 70-75% LTV, and required amortization payments on a 25- to 30-year schedule, with a balloon payment at the end of a seven to ten or more year term.   In addition, CMBS lenders would often underwrite net operating income on properties fairly aggressively, to reflect pro-forma rents, rather than the lower of in-place or market rents.   Therefore debt service coverage ratios, or the ratio of net operating income to debt service payments, would be underwritten very aggressively, sometimes at 1.1x or less. This often contrasted to requirements for agency and life company loans, which would require minimum ratios of 1.2x to 1.25x, usually on an amortizing basis.

Meanwhile, the agencies' pricing advantage, due to their implicit principal guarantee, were able to increase market share of multi-housing lending substantially at the expense of more traditional portfolio lenders, especially for lower leveraged loans. As multi-housing finance evolved during the 1990s and 2000's, the agencies were able to bring scale, efficiency, and capital markets execution to the development of multi-housing mortgage-backed security market. In addition, the implicit guarantee of repayment of principal was highly attractive to existing base of single-family mortgage backed security investors, which in turn provided highly competitively-priced mortgage products to borrowers.

Multi-housing Lending During the Financial Crisis

As the financial crisis deepened with problems in residential mortgage-backed securities and CDO's, spreads widened to unprecedented levels. Spreads in the public CMBS market widened as well, bringing new loan origination activity to a virtual standstill by the middle of 2008. Concerns regarding the effect of the recession on loan performance widened spreads to unprecedented levels. Furthermore, structural considerations grew in importance as regulators assessed the effects of rating agency and security holder conflicts.[32] As investors' risk premiums rose, values collapsed in the multi-housing sector, ushering in a period of rising defaults and deleveraging.   Defaults rose particularly sharply in the CMBS sector, while banks struggled with acute distress in the construction and real estate development portfolios, particularly in the area of distressed condominium and single-family developments.

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[32] For a review of the regulatory and structural considerations related to the future of securitization, see T. Riddiough, "Can Securitization Work? Economic, Structural, and Policy Considerations", *The Journal of Portfolio Management*, vol. 37: 5, 2011.

During this period of turmoil, while liquidity was gradually restored to the banking sector through the Troubled Asset Relief Program (TARP) and other measures, and the secondary market for CMBS was restarted through the Term Asset Backed Securities Loan Facility (TALF)[33], the agencies played a critical role in providing a liquidity backstop to the multi-housing sector. With their ability to raise funds in the secondary market, they were able to continue to issue mortgage-backed securities and provide funding sources for refinancing a variety of multi-housing loans across geographic areas. As a result, the agencies expanded both their on-book lending, as well as securitization activities. From the peak of the market in 2007 through the second quarter of 2012, the agencies expanded their multi-housing mortgage holdings from under $159 to $261 billion, surpassing banks and savings institutions as the largest single provider of multi-housing debt.   Overall debt provision to the multi-housing sector, on a net basis, has increased by close to $65 billion since 2007, while the GSEs were able to increase their share of the multi-housing mortgage market to more than 42% from under 30% just five years earlier. (Exhibit 41)

Exhibit 41 – Holders of Multi-housing Mortgages ($ billions)

	1970	1980	1990	2000	2007	2012Q2
Banks and Savings Institutions	24.9	67.0	127.4	139.1	261.1	247.8
Life Insurance Companies	16.0	19.5	29.0	33.7	51.8	50.6
Government-Sponsored Agencies	0.3	6.7	13.2	25.0	147.7	260.4
State and Local Government; excl pension plans	2.2	10.7	40.7	52.2	67.2	70.8
Federal Government; excl pension plans	3.1	10.4	22.9	13.9	14.4	13.9
Agency and GSE-backed mortgage pools	0.1	6.0	28.7	66.0	88.1	99.1
Private CMBS Issuers	0.0	0.0	0.9	46.9	124.0	83.3
Other	5.7	20.3	24.6	25.3	30.3	23.7
Total	52.2	140.6	287.4	402.1	784.6	849.6
Percent Share						
Banks and Savings Institutions	48%	48%	44%	35%	33%	29%
Life Insurance Companies	31%	14%	10%	8%	7%	6%
Government-Sponsored Agencies	1%	5%	5%	6%	19%	31%
State and Local Government; excl pension plans	4%	8%	14%	13%	9%	8%
Federal Government; excl pension plans	6%	7%	8%	3%	2%	2%
Agency and GSE-backed mortgage pools	0%	4%	10%	16%	11%	12%
Private CMBS Issuers	0%	0%	0%	12%	16%	10%
Other	11%	14%	9%	6%	4%	3%

Source: Federal Reserve Flow of Funds

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[33] The Federal Reserve and Treasury Department started the Term Asset Backed Securities Loan Facility (TALF) in November 2008 to jumpstart ABS lending on items such as car loans, equipment leases, and credit card debt. The program was eventually extended to new issue CMBS.   The program, which had approximately $200 billion in lending capacity, financed the purchase of AAA-rated securities.   For a summary of the asset-backed securities market and TALF, see Federal Reserve Bank of Chicago "The asset-backed securities market, the crisis, and TALF" at http://qa.chicagofed.org/digital_assets/publications/economic_perspectives/2010/4qtr2010_part1_agarwal_barrett_cun_denardi.pdf. The Troubled Asset Relief Program (TARP), enacted in October 2008, allowed the Treasury to administer four broad programs – capital purchases to financial institutions, support to the automotive industry, investment partnerships to the securities industry, and mortgage assistance programs.   For a review of activities to date, see Congressional Budget Office, "Report on the Troubled Asset Relief Program – October 2012", available at http://www.cbo.gov/sites/default/files/cbofiles/attachments/TARP10-2012_0.pdf.

With new issuance CMBS market finally jumpstarted in late 2009 and early 2010, thanks to the effects of TALF and declining spreads in the broader credit markets, a new form of CMBS securitization emerged, the so-called "CMBS 2.0", in which investors required additional credit enhancement for senior bondholders, more conservatively underwritten, lower leveraged loans, and improved securitization structures. As pricing gradually improved on CMBS lending products through 2011 and 2012, CMBS evolved to provide a source of funding multi-housing properties with incrementally higher leverage in secondary markets.

Meanwhile, life companies focused on lower leverage loans on higher quality properties in primary markets. In general, life company lenders have maintained relatively high underwriting standards over the credit cycle, including an emphasis on lower leverage loans and consistent loan refinance criteria. Bank lending, which focused on construction and development lending, as well as shorter-term loans over the past decade, became increasingly constrained during the financial crisis due to rising delinquencies.

Having worked through a large share of delinquent construction and development loans over the past four years, banks appear much better positioned to take advantage increased demand for increased multi-housing development activity. However, there is some concern that the implementation of the proposed Basel III international banking capital requirements will place pressure on lending margins, especially on smaller community banks. This could have the negative impact on the pricing and availability of capital to certain segments of borrowers.[34]

Recent Multi-housing Loan Origination Trends

Exhibit 42 shows the trend in commercial and multi-housing loan originations for major lenders, according to the Mortgage Bankers Association. Although the index tracks commercial loans as well as multi-housing loans, it does provide insight into the volatility of mortgage originations over the past decade.[35] Commercial banks and conduit lenders witnessed a very rapid rise in origination activity between 2005 in late 2007. During the onset of the Financial Crisis during 2008, both of these sources of capital retrenched severely; they have been relatively slow to recover.

Fannie Mae and Freddie Mac lending, on the other hand, increased in 2008 and has generally remained quite stable over the course of the past decade relative to other lender types. Confirming the rising trend in the multi-housing debt outstanding, the MBA index of agency loan origination volume as of the first quarter 2012 was almost double the level registered throughout the first half of the decade. Indeed, the agencies have played an important role in providing debt during periods of crisis; during the early 1990s, their holdings also increased during a timeframe of rapid deleveraging in the multi-family sector in the wake of the thrift crisis.

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[34] In June 2012, the Federal Reserve proposed implementation of Basel III capital standards across most US banks. This may require many US banks to significantly increase their capital ratios during the standard's implementation period. For a discussion, see McGrane, V., Reiker, M., and Fitzpatrick, D., "Capital Rule is One Size Fits All", Wall Street Journal, June 7,2012, at http://online.wsj.com/article/SB10001424052702303665904577452673914132852.html. For a discussion of the Federal Reserve's proposal, please see http://www.federalreserve.gov/newsevents/press/bcreg/bcreg20120607a4.pdf.

[35] The index, which has a base value of 2001 equals 100, is based on a survey of lenders by the MBA. Although the index tracks commercial loans as well as multi-housing loans, it provides a useful benchmark for assessing trends in loan origination among the principal commercial mortgage lenders. The MBA publishes the separate property type index that indicates that multi-housing loan originations are recovering well. The index reached a peak of 220 in the fourth quarter of 2007 and reached a low of 49 in the first quarter of 2010. Since then, multi-housing origination volume has increased steadily. During the second quarter of 2012 the index reached 170, which reflected a 19% increase over the previous year.

Exhibit 42 – MBA Loan Origination Index
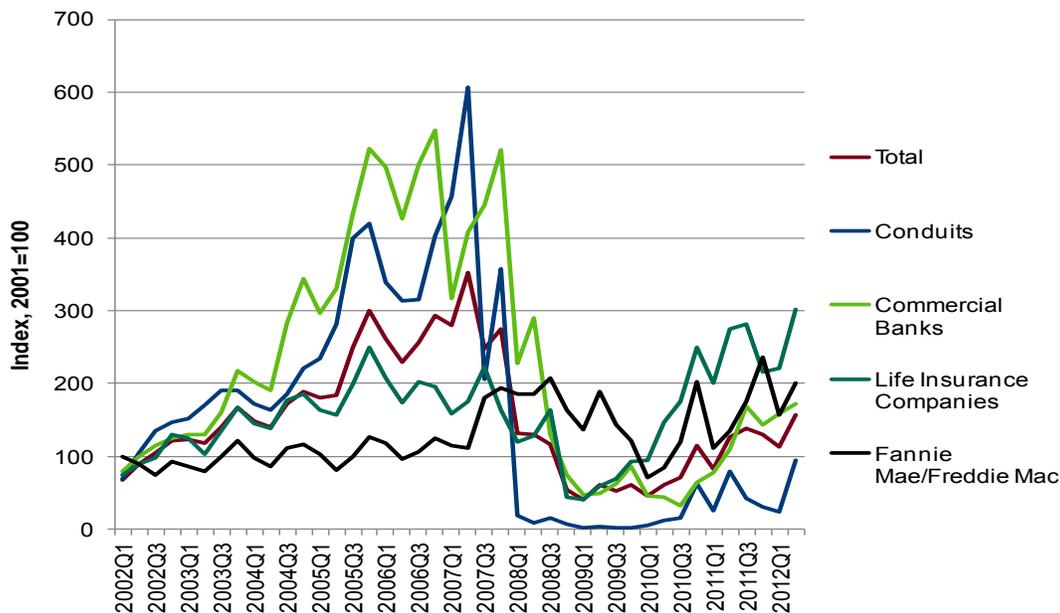
Source: Mortgage Bankers Association

Secondary Market and Affordable Housing Finance Issues

While liquidity has been gradually restored to a number of markets, those areas that have seen the weakest economies and the most distress in the residential housing market, continue to suffer from weak lending activity. A concentration of distressed banks, located particularly in the Southeast, in states such as Georgia and Florida, has struggled with high non-performing rates on their loan portfolios.[36]

While liquidity has been gradually restored to the banking sector and banks have aggressively worked out their portfolio of nonperforming construction and development loans[37], liquidity remains an issue in secondary markets, and among affordable and smaller segments of the multi-housing industry. For instance, the Joint Center for Housing Studies notes that financing for midsize rental properties with 5 to 49 units, is less readily available and less closely integrated with global capital markets that is the case for larger properties which are favored by better capitalized investors. As a result, owners of midsize properties, which account for some 20% of the rental market, often have more limited access to mortgage financing with the most favorable loan terms, such as fixed rate mortgages with terms that extend longer than 10 years.[38]

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[36] For instance the noncurrent rate on Georgia banking institutions' total loans and leases was 6.42% as of the second quarter 2012, according to the FDIC. The comparable figure was 5.1% in Florida, and 4.2% in North Carolina. Nationally, the nonperforming loan rate is currently 3.89%.

[37] The FDIC reports that lending institutions noncurrent rate on construction and development loans fell to 10.81% in the second quarter of 2012 continuing a steady decline from the peak of of 16.8% recorded during 2010 Q1. The volume of construction and development loans reached a peak of $631 billion during 2008 Q1. As of 2010 Q1, the amount outstanding fell to $217 billion. See FDIC statistics at http://www2.fdic.gov/qbp/loanperformance.xls.

[38] See Joint Center for Housing Studies at Harvard University, 2009. "State of the Nation's Housing 2009" Cambridge, MA at http://www.JC HS.Harvard.edu/publications/markets/son2009/SOM2009.pdf.

Certain segments of affordable housing and the secondary market finance appear to be better served than others. The Federal Housing Administration's (FHA) multi-housing programs for new construction/rehabilitation and refinance of affordable rental housing have provided an additional source of liquidity during recent times of distress. In fiscal year 2012, FHA's principal multi-housing programs provided loan guarantees on over $14.6 billion of multi-housing projects, up from $5.2 billion in 2008.   However, HUD's capacity to process loan requests is somewhat strained, while its budget is subject to the annual federal appropriation process.[39] Banks in large markets such as New York and Los Angeles reportedly provide a large amount of affordable housing capital through their Community Reinvestment Act (CRA) programs. However, bank capital for affordable housing developments in secondary markets appears to be more limited. State housing finance agencies can fill part of the gap with tax exempt financing for low income, public, and tax credit housing developments, but they are subject to limitations on the amount of annual tax-exempt bond issuance.

In times of constrained liquidity, however, the GSEs have been a relatively stable source of capital to secondary markets, workforce housing, and lower income housing developments, and to smaller properties.   For instance, according to Freddie Mac approximately 38% of the loan volume that the firm purchased or guaranteed prior to 2008 qualified as "affordable". In recent years, this share has increased. Affordable loans comprised 76% of total lending in 2010 and 80% in 2011. In addition, approximately 60% of Freddie Mac's total production was located outside of the nation's 15 largest markets.[40] As noted earlier, there is a growing gap between the demand and supply of affordable housing units. With the number of rental households growing rapidly, there may be increasing pressure on affordable rental markets, especially those that serve secondary markets.

CBRE Perspectives on Multi-housing Lending in Rent Burdened Markets

Exhibit 19 of this report highlights those particular metropolitan markets that face the most significant challenges on rental affordability. To apprise the dynamics of these markets we conducted a series of discussions with investment sales professionals with CBRE. The focus of these discussions was to ascertain the lenders and types of programs that their buyers have worked with over the years when pursuing investments in these markets with high rent burdens.

Talking with Richard Montana with CBRE in South Carolina, clearly there are unique market dynamics at play that help drive the challenges to affordability in this market. Most of the city is a peninsula which limits the location choices that tenants have. If one can drive, one can get up on the bridges to the adjoining areas where rents are lower, but with lower income households and college students, such a commute does not pay off relative to the ability to be close to work and or school. In the face of these location challenges, rents are relatively high in this market.

All other things equal, the supply dynamics here might make one think that lenders would be willing to take a bit of a chance on this market. It is like Manhattan in a sense with physical limits on supply and less risk of income shortfalls from new projects coming to the market. Still, in the deals that Richard has negotiated and seen in this market, he has only seen GSE debt as a viable source of financing.

Charleston is avoided because it is a small market and these areas are perceived to have more underwriting risk. The income performance of assets in smaller markets can move very quickly in response to shocks such as a new apartment building delivered across the street from a subject asset. To mitigate potential risks such as a reduction in income that might make servicing debt a challenge, the Life Companies profile the smaller markets and have little to do with them.

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[39] The FHA's major multi-housing programs include new construction/substantial rehabilitation (NCSR), section 223(f) for the purchase or refinance an existing multi-housing properties, and loan refinancing for properties that currently have an FHA – insured mortgage-section 223(a)(7). The agency provides mortgage default insurance that is funded by borrower fees into the program.   Statistics on FHA multi-housing commitments can be found at: http://portal.hud.gov/hudportal/HUD?src=/program_offices/housing/mfh/mfdata/firmcmtir
[40]Freddie Mac defines an "affordable" loan as one where half or more the units are rented to households whose income is no more than 60% of the area's median income.   Unpublished statistics from Freddie Mac were provided for analysis.

This issue of lenders developing certain profiles on risk is clearly at play in other markets. In discussions with Robert Given with CBRE in Miami, it is clear that age cohorts of assets matter for Life Company loans. Miami is among the markets where housing burdens are the most challenged, but it is still a very large metropolitan market and the concerns over market size cannot come into play here. Still, the Life Company lenders who are active in this market simply will not look at multi-housing assets more than ten years old.

Again, when underwriting loans, there are particular characteristics the Life Company lenders pursue to mitigate risks. Older assets tend to see lower rents than the market overall as older finishes and amenities must be offered at a discount to attract tenants. Because of this discount issue, many older assets are in fact where the segment of rental demand that seeks affordable units is satisfied.

Just over 15% of all multi-housing units in Miami in the 5+ units in structure universe have been built within the last ten years. If the Life Companies are simply avoiding the other 85% of the market, these underwriting criteria will make the GSEs the primary funding option for most of the affordable multi-housing units in the market.

This said, Robert did note that in the universe of multi-housing assets with fewer than 5 units in the structure, there is financing available from local banks. Many of these assets are smaller, older and affordable. Still, according to the data from the ACS, it is a small segment of the overall market constituting only 23% of all rental housing units in the broader region composed of the Miami, Fort Lauderdale and West Palm Beach metropolitan markets.

How Can Existing Lenders Fill Multi-housing Lending Needs in the Absence of the GSEs?

Clearly, the GSEs have been a critical source of funding for the multi-housing property market during times of liquidity constraints. This is been particularly evident during the late 1980s and early 1990s housing bust, which shrunk the banking sector significantly. It is been even more evident during the recent financial crisis, where the GSEs have been able to make up for the decline of liquidity from other sources including banks and CMBS issuers.

In the absence of the GSEs, one can make certain assumptions and conjectures as to how current annual originations of $50 billion or more could be filled by other lenders. Certainly, some balance sheet lenders would be willing to reallocate funds towards multi-housing debt, given their current portfolio underweight to the sector. However, this reallocation alone may provide limited dollars on an annual basis to fill a gap caused by the GSEs withdrawal from the market. For instance, multi-housing accounts for approximately 15% of life company commercial loan portfolios, far short of the 28% share across all lenders including the GSEs.

If life companies were to reallocate toward multi-housing lending to attain a 28% portfolio share, this would translate into a shift of approximately $39 billion. However, only a small portion of this amount - perhaps $5 billion per year in new origination - could come from this source; obviously, lenders would be constrained in the amount of dollars that could be practically reallocated to the sector in a given year, along with constraints related to borrower relationships on existing commercial loans, and considerations related to the relative value pricing of multi-housing loans relative to other commercial loan opportunities.

A similar situation would exist for banks, which could potentially reallocate over $150 billion to bring their multi-housing portfolio weighting in line with the market average. Again, however, if banks could perfectly reallocate this amount, it may amount to around $15-20 billion per year.[41] So, even under the most aggressive assumptions, there would remain a substantial shortfall.

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[41]This assumes in both cases that lenders would be able to seamlessly reallocate to the current multi-housing share of commercial real estate debt. It assumes a seven year average loan term to derive the annual amount of potential new life company and bank originations. Of course, these figures should be considered

It is more likely that CMBS originations would fill a portion of a void left by the GSEs. CMBS has at times been able to expand rapidly to meet loan demand, as it has not faced the same origination constraints as portfolio lenders. For instance, the amount of multi-housing debt outstanding in private CMBS pools more than quadrupled in a relatively short timeframe, between 1995 and 2000. The net increase of $35 billion exceeded the net increase in banking sector multi-housing debt holdings over this period, a lending segment almost ten times the size of CMBS. Over this period, CMBS accounted for more than one-third of the net increase in multi-housing debt. CMBS multi-housing debt also expanded rapidly between 2003 and 2007, with a net increase of nearly $57 billion (approximately $14 billion on an annual basis), accounting for one-quarter of the overall net increase in debt.

If we conducted a simple exercise from the historical information above, where each of the capital sources were able to reallocate funds or increase loan production under the most favorable conditions, it is likely that there would remain a gap in current production levels that would need to be satisfied by additional sources of capital. If life companies and banks increased production by reallocating $5 billion and $15-20 billion, respectively, to the sector on an annual basis, while CMBS ramped up loan production by $14 billion (reflecting the fastest increase on annual basis during the 2003-2007 period), the corresponding tally of $34-$39 billion would fall short of approximately $50 billion in agency production activity.   Other lenders, whose short-term capacity to raise funds may be limited, would likely account for only a small portion of the remaining gap.

Exhibit 43 -- Contributions to Multi-housing Mortgage Growth Rate

Contributions to Multi-Housing Mortgage Growth Rate
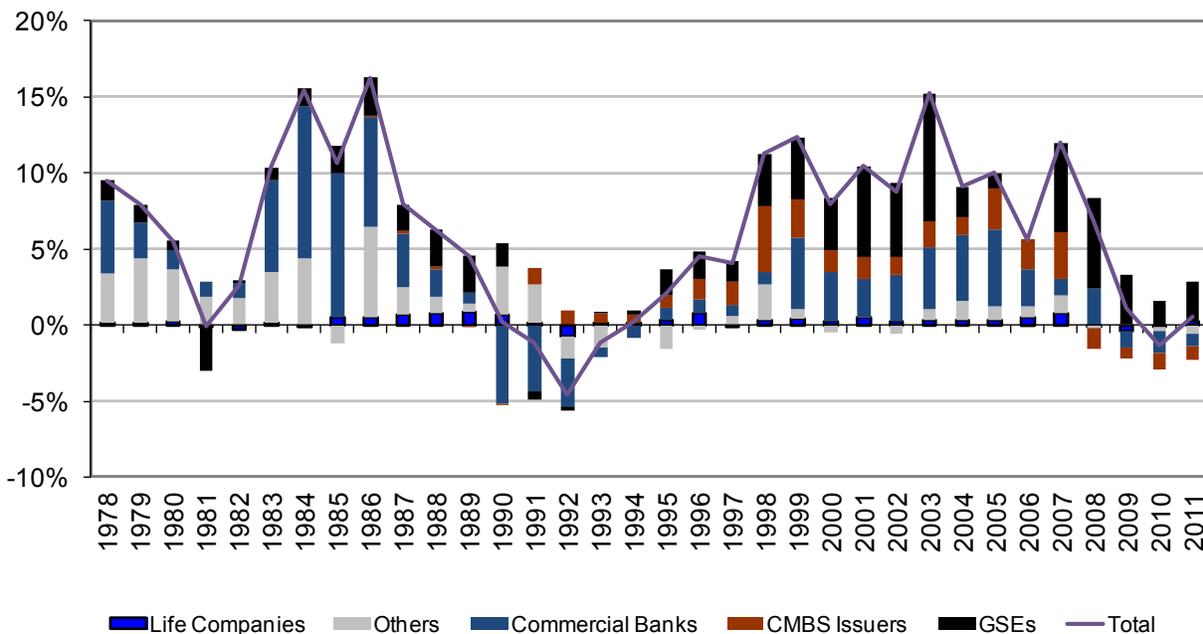
Sources: Federal Reserve Flow of Funds, CBRE Research Calculations

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very optimistic, due to several constraints, including: existing borrower relationships refinance needs of the existing commercial loans in lender's portfolios, and pricing considerations.

An entirely private market model based CMBS originations would raise important considerations for policy makers. At various points in time, CMBS markets have been exposed to wide swings in pricing, which have led to severely constrained liquidity. For instance, the CMBS markets shut down origination activity in the wake of the Russian debt crisis and the collapse of Long-Term Capital Management in 1998, and again during the 2008 Financial Crisis. Such volatility in the availability and pricing of debt may not be an optimal situation, especially during periods of economic stress or high loan demand arising from refinance needs. Secondary geographic areas and smaller borrowers may face liquidity constraints and suffer from a "flight to quality", as witnessed during the recent financial crisis.

A market that is based on private CMBS lenders imply a substantial shift in the way that risk is priced and distributed among various parties in the lending market. Without two large entities backed by the federal government guaranteeing multi-housing debt, there would be a requirement to raise a large amount of private risk capital to effectively replace the GSE guarantee. This would come in the form of additional first loss buyers who purchase the most subordinated bonds in a securitization. This would imply that loan pricing would need to increase to attract additional risk capital to the sector. In turn, higher rates on multi-housing loans in turn may reduce loan demand, as leveraged borrowers face higher debt coverage constraints and lower expected returns. This potential rationing of credit may a negative impact on affordable properties and secondary markets, which had been served extensively by the GSEs. While CMBS lenders and portfolio lenders would likely fill a portion of the gap in originations from a withdrawal of the GSEs from the lending market, certain segments of the market – especially those in secondary markets and lower quality, affordable properties – could face a rising lending gap.

Credit Performance of Multi-housing Debt

In general, the credit performance multi-housing mortgage debt has been strong over the long-term and also during the most recent recession. However, during recent years, credit performance has differed substantially by lender type. During the middle part of the decade, in an effort to increase loan origination volume and diversify securitization pools, CMBS issuers stretched their underwriting standards. CMBS loans became increasingly highly-leveraged, while the quality of loan sponsors diminished. First mortgage loans often carried loan-to-value ratios of up to 85% based on projected, rather than in-place, income. As market conditions deteriorated in 2008 and 2009, the credit performance of CMBS loans suffered significantly. As Exhibit 44 shows, CMBS delinquency rates for multi-housing loans reached a peak of 14.9% during 2010 and have remained quite elevated over the past two years.

This performance diverged substantially from that of banks and the agencies. Agency lenders, in particular, held on to fairly stringent underwriting criteria and focused on generally lower leveraged loans to higher quality borrowers. As a result, both Fannie Mae and Freddie Mac have witnessed a very strong credit performance during the recession, with delinquency rates remaining below 1% over the course of the recession and recovery to date. Banks have witnessed slightly higher delinquency rates and loan losses in recent years. Delinquencies on bank portfolios increased from under 1% at the beginning of 2008 to a peak of 4.65% during the 2010Q1. Thereafter, their credit performance improved substantially, with delinquencies slightly above 2% as of 2012Q2. Since mid-2006, the CMBS delinquency rate has averaged 6.9%, compared with 2.3% average for bank lenders. In comparison, Fannie Mae's delinquency rate averaged only 0.37% over this period, while Freddie Mac's averaged a mere 0.15%.

Exhibit 44 – Multi-housing Delinquency Rates by Lender

Delinquency Rate
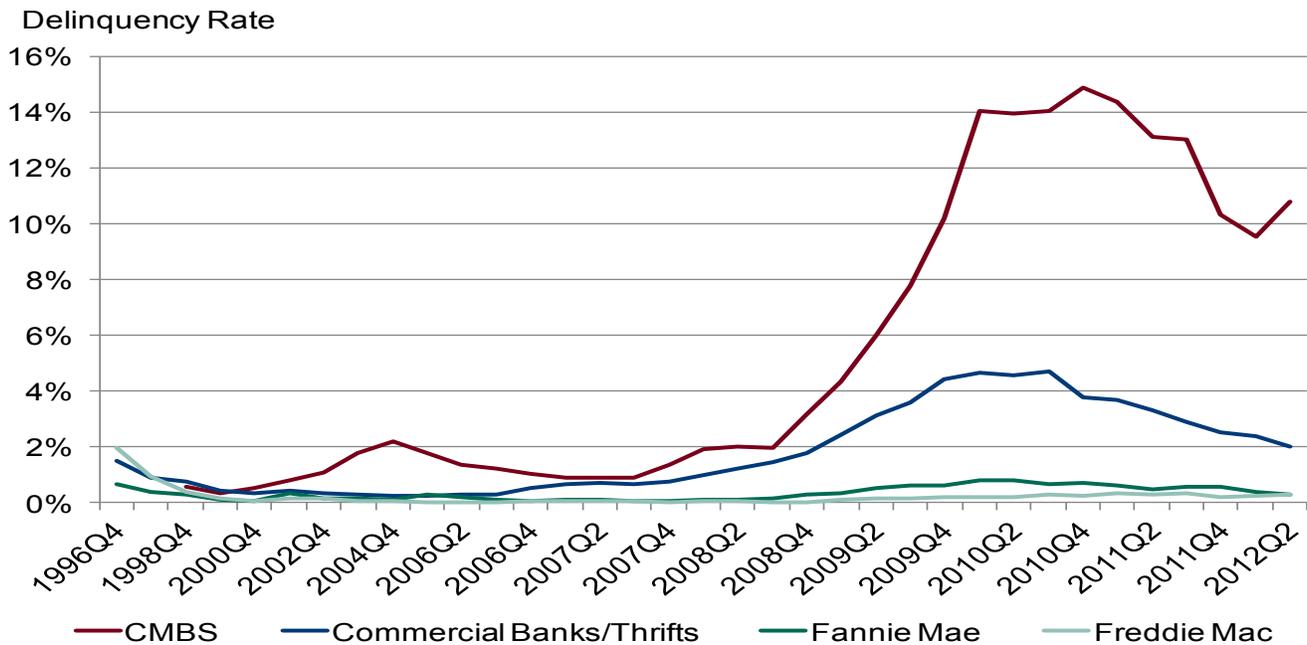
Sources: Mortgage Bankers Association, Trepp, and CBRE Research Calculations

The multi-housing sector is generally perceived to have a strong credit profile compared to other commercial property types. The diverse nature of tenant leases often provides borrowers an advantage in managing cash flow uncertainty. Commercial properties on the other hand, may have either lumpy or concentrated tenant rollover, which may increase term default or refinance risk. The credit performance of multi-housing debt in commercial banks has tended to be stronger over time than other commercial property types. However, as the recent performance of CMBS loans indicates, lapses in credit underwriting, and highly aggressive loan-to-value and debt service coverage loan parameters can prove to be highly detrimental to credit performance during periods of high real estate market stress.

Multi-housing Loan Refinance Needs

Over next few years, the multi-housing sector will continue to face challenges due to the high levels of refinance needs. While a considerable amount of deleveraging is likely to take place as loans mature, especially among loans that were originated at the peak of the market, the demand for permanent refinance capital will remain quite high over the next two years.

In some cases, maturing loans will require some form of "gap" financing or additional borrower equity due to lower overall property values. This will especially be the case for higher leveraged CMBS loans that were originated at the peak of the market and often were interest only for full or partial term.   However, property rents and revenue have been on the increase, especially in the larger supply constrained markets. Combined with lower cap rates, higher property values may begin to support higher loan amounts in certain markets.   Refinance issues are likely to continue to be concentrated in secondary markets, where property values have not budged much, and among properties that carried highly leveraged capital structures.

According to estimates by Trepp, multi-housing loan maturities will reach a peak of more than $90 billion per year between 2012 and 2014. In contrast, overall multi-housing maturities were only $60 billion in 2007. The increase in impending maturities reflects the flurry of 5-to-7 year loans that were originated in the latter part of the 2000s. Between 2012 and 2016, there are more than $452 billion of multi-housing loans are scheduled to mature. In contrast, $383 billion matured during the previous five years.[42]

Clearly, multiple sources of capital will be required to meet growing refinance needs over the short term. Over the past three years, the agencies have provided an important role in helping multi-housing owners with maturing loans navigate the transition to refinance during a period of lower property values and weaker rents. While improved multi-housing market fundamentals will help ease refinancing issues, the near-term demand for refinance capital will be remain very high. Therefore, plentiful multi-housing capital sources will be needed to ensure an orderly transition of multi-housing borrower capital structures, and to prevent broader capital market disruptions.

Trends in Multi-housing Loan Pricing and Underwriting Terms

While there exist multiple indices of bond pricing, including daily and weekly updates from broad market index averages, parameters for individual loan originations are less readily available across different lenders. In addition, differing loan-to-value and coverage ratios and other underwriting terms make direct loan comparisons more difficult. In this section we compare broad trends in multi-housing loan origination parameters for contract rates and loan-to-value. A long-term trend comparison is available from the American Council of Life Insurers' (ALCI) Commercial Loan Commitment Profile, and Freddie Mac's internal survey of portfolio and securitized loans. In the following section, we use a modeling framework to quantify the differences in loan pricing, while taking into account differences in underwriting parameters across lenders.

Exhibit 45 shows the long-run trend in ACLI and Freddie Mac quarterly average multi-housing lending rates on closed transactions, along with the 10-year US treasury rate.[43] Is interesting to note that from the commencement of the Freddie Mac series in 1994, the two multi-housing lending data series track one another fairly closely in terms of both levels and changes. In fact, if one calculates the average spread of the two series to the 10-year treasury rate, they are virtually identical at close to 165 basis points. It would suggest that multi-housing loan pricing is fairly closely integrated across the two major lenders. However, underwriting parameters have varied between the lenders. For instance, the average LTV for Freddie Mac loans has been 70.6% since 1994, compared with 67.2% for life company lenders. (Exhibit 45) LTV ratios generally became more conservative after 2003, which may reflect the fact that lenders assumed more conservative capitalization rates for loan refinance analysis, despite falling appraisal capitalization rates used for current property valuations.

[42] Source: Commercial Mortgage Maturities by Lender Type (Update: 4Q 2011 data), Trepp, at www.trepp.com.
[43] The Freddie Mac lending rate reflects 7- to 10-year term fixed-rate permanent loans. The ACLI lending rate reflects a range of maturities; during the most recent 10 year period, quarterly data observations generally showed average maturities from 7 to 11 years. The ACLI data series begins in 1965, while the Freddie Mac data series begins in 1994.

Exhibit 45 – ACLI and Freddie Mac Average Lending Rates, 10-Year U.S. Treasury
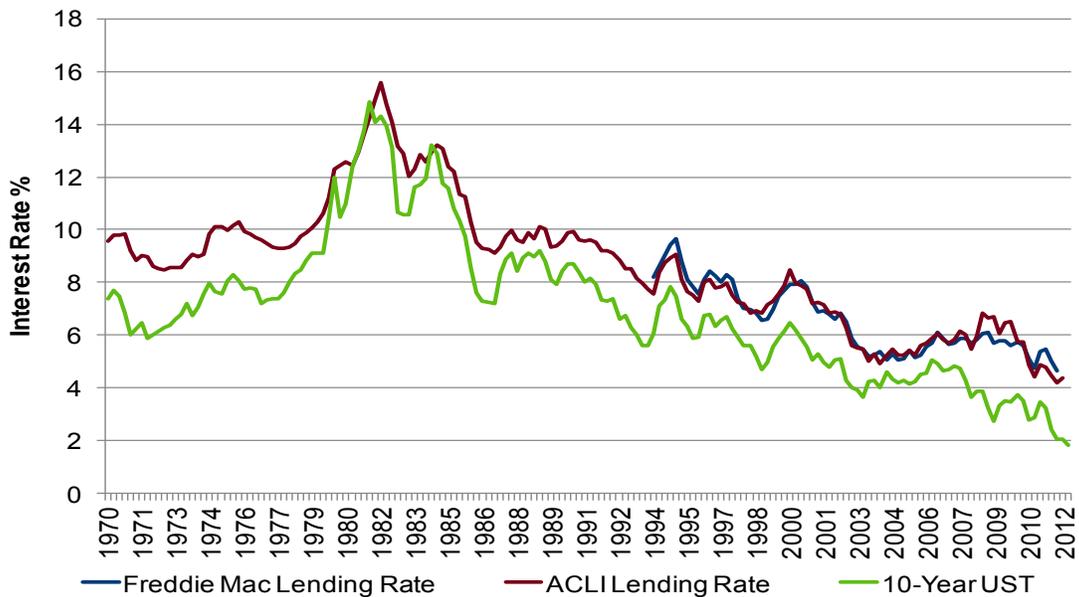
Sources: American Council of Life Insurers, Freddie Mac, Moody's Economy.com, and CBRE Research Calculations

Exhibit 46 – LTV Trends for ACLI and Freddie Mac Multi-housing Mortgages (4 qtr moving average)
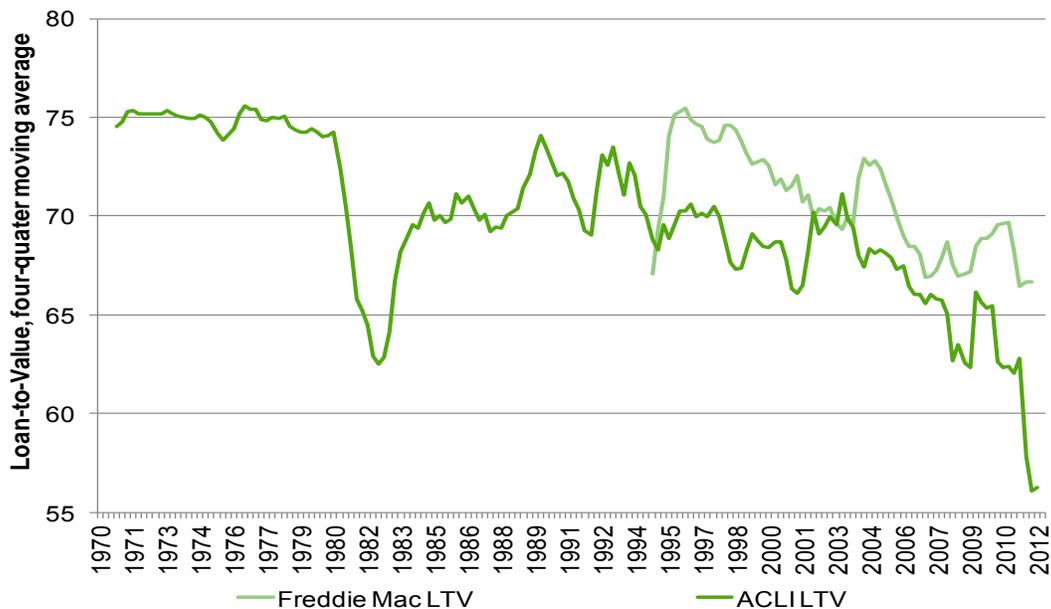
Sources: American Council of Life Insurers, Freddie Mac, and CBRE Research Calculations

Furthermore, Exhibit 45 traces out the periods where multi-housing loan credit spreads to the U.S. Treasury widened and narrowed during times of varying liquidity and market sentiment. Spreads were generally wide at over 200 basis points during the mid-90s, but then narrowed substantially over the course of the 1990s as market liquidity and multi-housing performance improved. Spreads widened in the wake of the Russian default crisis in 1998, consistent with trends observed in the broader capital markets. They remained relatively wide through the early 2000's, due to recession and increased risk aversion.

During the middle part of the decade, however spreads fell to historically low levels, below 100 basis points relative to the U.S. Treasury rate reflecting decreased risk aversion and increasingly high levels of liquidity and competition from secondary market sources such as CMBS. Of course, the situation changed quite rapidly by mid-2008, when spreads rose sharply and remained elevated through early 2009. It is interesting to note that Freddie Mac spreads generally remained lower than ACLI spreads during the financial crisis, as the agencies were able to provide more ample and favorably priced liquidity to the multi-housing market. As liquidity was gradually restored to the capital markets, conditions began to improve across both segments, with spreads falling back down close to their historical averages by late 2010 early 2011.

Multi-housing Loan Pricing Effects of the GSEs

Overview

In this section we attempt to quantify the impact of the GSEs activity on multi-housing loan pricing. Undoubtedly, our ability to determine the precise impact on pricing is difficult, due to a number of factors. Without a formal equilibrium model of pricing, it is difficult to determine the effect of the GSEs on multi-housing pricing from recently observed information on loan characteristics, spreads, and property characteristics.

There are several approaches that may be used to approximate the differential in pricing between the GSEs and other multi-housing lenders. One approach, could look at pricing differentials on public market securitizations, specifically multi-housing securitizations that are backed by the GSEs and private market CMBS. One could determine the approximate difference and trading levels for senior bonds backed by the GSE guarantee, and other publicly traded CMBS securities.

Using this information, one could translate the impact on bond pricing to pricing at the loan level. While this may provide a good approximation of the effect of removing the guarantee on loan pricing, one must also take into account the potential impact on the subordination levels of senior bonds granted by the rating agencies. This in turn, could have an additional impact on the pricing of loans, given profit requirements. Furthermore, the withdrawal of the agency guarantee may have a secondary impact on pricing due to an overall withdrawal of liquidity. This impact may be more difficult to determine.

Another approach, which may be viewed as complementary to the above method, would compare agency loan pricing against public and private market loan pricing. The approach would involve building a multifactor model of loan pricing to determine the overall effect of the GSEs, holding certain loan characteristics such as LTV, coverage ratios, loan size, and other factors constant.

Again, this approach has shortcomings due to the fact that the withdrawal of GSE liquidity is likely to have an impact on the supply of credit, and therefore pricing. Historical observations on GSE and other lenders' pricing activity are dependent on the overall level of market competition and the GSE guarantee itself. Non-GSE lenders' pricing levels may be at least partially determined by the current GSE guarantee. In other words, the GSEs' pricing levels may cause other non-GSE lenders to reduce their pricing in order to retain market share. Therefore the ultimate impact on pricing may be different than what we currently observe as pricing differentials in the market. One further shortcoming of the approach would reflect the possibility that the market is segmented based on either loan quality or sponsorship, and therefore agency and non-agency loans may not be directly comparable.

Methodology

To examine the impact of the GSEs and other factors on pricing, we examine how lending rates over a corresponding treasury rate vary with quantifiable loan characteristics. Unfortunately, the approach does not take into account qualitative factors that may have an influence on pricing, such as sponsorship and property quality. The approach involves estimating a simple linear cross-sectional model of loan credit spreads, against a number of loan parameters. Agency loans are identified in the model by a dummy variable, which can be used to quantify the overall market pricing differential from the GSEs, holding the other factors constant.

Data and Model

The data sample includes fixed rate loans originated by the agencies, CMBS issuers, life companies, banks, and other lenders. The loans reflect permanent financing for stabilized multi-housing properties. The data comes from two sources of loans originated from 2010 through mid-2012. The first source is the CBRE Capital Markets database, which tracks multi-housing loans where CBRE Capital Markets acted as broker to life insurance companies, banks or other lenders; or where CBRE Multi-housing Finance originated loans on behalf Fannie Mae and Freddie Mac. This source includes 778 multi-housing loans originated primarily on behalf of Fannie Mae and Freddie Mac. Included in this sample are 151 loans, or 19% percent, that were brokered to life company, bank, and other lenders. The second source is a sample of 150 CMBS loans on recent fixed rate conduit securitizations that are reported in the Trepp database. Exhibit 47 shows a description of the primary data variables used in the analysis.

Exhibit 48 provides loan descriptive characteristics by lender. Although a majority of loans in the sample were originated by the agencies, close to one-third were originated by non-agency sources. Upon first observation, is interesting to note that life company average spreads are lower than those of the agencies and overall. However, these loans also carry lower loan-to-value ratios and average and are generally larger sized. It is also interesting to note that the average implied capitalization rates vary fairly substantially across lenders. In addition, the percentage of loans that carry either partial or full interest-only terms is fairly high, at more than 50%. By controlling for these various factors, we can attempt to identify the impact of the agencies on loan credit spreads.

The initial specification of the model is as follows:

$$\text{Spread} = a_0 + a_1 \text{Term} + a_2 \text{Amort\_term} + a_3 \text{IO\_Term} + \\ + a_4 \text{InterestOnly} + a_5 \text{Loan\_size} + a_6 \text{M\_Duration} + a_7 \text{Loan\_Constant} + a_8 \text{Agency} \\ + a_9 \text{LTV} + a_{10} \text{DSCR} + a_{11} \text{Implied\_Cap\_Rate} + e_t$$

where e_t is a randomly distributed error term. In analyzing the statistical properties of the estimated model, we found the following issues. First, the term and modified duration variables were found to be highly correlated, which could lead to multi-collinearity issues. In addition, the IO term and InterestOnly variables were highly correlated. Furthermore, the coefficient on the DSCR variable was found to be insignificant under a variety of specifications. This was unexpected; however the LTV variable was found to be statistically significant and appeared to have a more determining impact on the credit spread.

Exhibit 47 – Description of the CBRE Debt and Equity Finance Loan Database

Variable	Description
Spread	Spread between note rate and average treasury
Term	Loan term in months
Amort_term	Amortization term in months
IO_Term	If interest only, term in months
InterestOnly	Dummy variable, 1 if interest only, 0 otherwise
Loan_size	Loan size at origination $
M_Duration	Modified duration
Loan_Constant	Loan constant, initial annual payment (P&I)/ loan amount
Agency	Dummy variable, 1 if agency loan, 0 otherwise
LTV	Loan-to-Value ratio at origination
DSCR	Debt service coverage ratio
ImpliedCapRate	Implied Capitalization Rate, NOI/ appraised value at origination

Exhibit 48 – Loan Descriptive Statistics

	Loan Count	Mean Values								% Partial or Full Interest Only, %
		Spread	Note Rate %	Loan Constant	Loan Size	Modified Duration	LTV	DSCR	Implied Cap Rate	
Agency	627	230	4.54	6.29	17,344,429	6.98	69.7	1.66	6.40	69.2
Bank	38	263	4.94	6.54	11,222,334	6.41	65.1	1.33	6.43	28.9
CMBS	165	341	5.40	6.92	12,919,190	6.50	68.5	1.46	7.22	26.1
Life Company	87	216	4.43	6.26	24,907,855	7.04	55.5	1.61	5.88	40.2
Other	11	300	5.32	6.74	12,013,864	6.34	72.8	1.31	7.08	45.5
Total	928	251	4.71	6.41	16,952,810	6.87	68.0	1.60	6.51	56.9

The final variables that were included in this specification are listed in Exhibit 49 below along with coefficients, and key statistics in addition summary regression statistics are provided. Reflecting the issues noted above, the Term, IO Term and DSCR variables were omitted. It is interesting to note, that a few variables have a very small impact in explaining the variation in spreads. For instance, amortization term and the interest only dummy have very small coefficients. Modified duration has a negative coefficient, which appears to contrast with the general perception of an upwardly sloping credit yield curve. This effect could be the result of the very flat yield curve conditions that were observed during the sample period between 2010 and mid-2012, where many lenders were known to require interest rate floors on shorter-term loans.

However, the coefficient on loan-to-value is as expected – as loan-to-value increases, credit spreads increase. In addition, the implied cap rate has a positive influence on credit spreads reflecting the fact that loans with higher cap rates may be perceived as relatively more risky.

Whether a loan was originated by an agency lender or not has a strong effect on the credit spread. In fact, the agency dummy variable indicates that, holding all other variables constant, agency loan spreads were some 61 basis points lower than loans originated by other lenders over the period. It is interesting to note that this result is slightly lower, but consistent with Freddie Mac's analysis of that imputing loan pricing differences by comparing pricing on Freddie Mac and private CMBS securitizations.

Exhibit 49 – Loan Analysis Model Results

Regression Statistics	
Multiple R	0.6570
R Square	0.4317
Adjusted R Square	0.4267
Standard Error	49.0550
Observations	928

ANOVA

	Df	SS	MS	F	Significance F
Regression	8	1679607.064	209950.88	87.246964	2.332E-107
Residual	919	2211479.377	2406.3976		
Total	927	3891086.441			

	Coefficients	Standard Error	t Stat	P-value
Intercept	218.828	17.493	12.509	0.000
Amort_term	0.055	0.019	2.876	0.004
InterestOnly	-3.445	3.932	-0.876	0.381
Loan_size	0.000	0.000	-5.561	0.000
M_Duration	-11.600	1.019	-11.388	0.000
Loan_Constant	3.585	0.827	4.333	0.000
Agency	-61.723	3.840	-16.074	0.000
LTV	1.404	0.187	7.510	0.000
Implied_Cap_Rate	4.474	1.844	2.426	0.015

Timeline of Important Policy Events Related to Multi-Housing Finance

1968 – Fannie Mae reconstituted as a private corporation.

1970 – Freddie Mac founded as a private corporation.

1970s – Ginnie Mae guarantees multi-family mortgage backed securities backed by FHA-insured project loans. Fannie Mae purchases FHA-insured multi-housing loans. Freddie Mac introduces the first secondary market plan for a conventional multi-housing loans. Freddie Mac securitizes a small volume of multi-family family loans with single-family loans in its Mortgage Participation Certificates.

1974 – The Housing and Community Development Act of 1974.
The Act established the Section 8 Existing Housing Program. The program subsidized new affordable housing development under the Section 8 New Construction and Substantial Rehabilitation Program and established rental vouchers for low-income households. Several construction assistance programs consolidated into the Community Development Block Grant (CGDG) program. Over time, the voucher program would become the primary vehicle of rental assistance to low-income renters. As of 2009, the program supported payments for over 1.5 million low-income renters.[44]

1977 – Community Reinvestment Act.
Required banks and savings and loan institutions to provide mortgages and other services to all areas from where they receive deposits. Required regulators to consider compliance with the Act before the approval of certain bank mergers, acquisitions, and other banking activities.

1980 - The Depository Institutions Deregulation and Monetary Control Act of 1980.
The Act deregulates Savings & Loan institutions, allowing them to originate alternative mortgage products. This allowed a substantial growth of debt to finance both multi-housing construction and permanent loans.

1983 - Fannie Mae begins to issue mortgage pass-through securities backed by multi-housing loans. Freddie Mac follows suit in 1984.

1985 – Savings and Loans' share of the nation's multi-housing mortgage debt outstanding reaches 43%, up from 30% just five years earlier.

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[44] See Couch, L., "Housing Choice Vouchers", in National Low Income Housing Coalition (ed.) Advocates Guide to Housing and Community Development Policy (pp. 46-49), at http://nlihc.org/doc/advocacy guid2009-web.pdf.

1986 – Tax Reform Act of 1986.
The Act eliminated tax incentives for individual investment in rental housing. Accelerated depreciation was eliminated and the time period for depreciation costs was extended to 27 1/2 years. The Act also reduced maximum tax rates and therefore eroded the value of depreciation allowances to the investor. In addition, individual investors could no longer use passive losses from real estate holdings to offset income earned from wages and salaries dividends interest and other income; therefore, depreciation could only reduce the taxable income of real estate. The previously favorable tax treatment created a boom in rental development, which was quickly reversed by the Act.   Multi-housing construction fell sharply: after reaching a peak of 550,000 units in 1986, multi-housing completions fell to a mere 124,800 units by 1993.   Rental vacancy rates rose from 5% in 1981 to a peak of over 8% by 1987.

1986 – Low Income Housing Tax Credit Program (LIHTC), part of the Tax Reform Act of 1986.
Establishes the Federal tax credit program for the development of affordable housing. Credits are allocated to the states on the basis of population and awarded through state housing agencies. From 1987 through 2008, the LIHTC program funded development of an estimated 1.3 million multi-housing units, accounting for 15.3% of all multi-housing permits during this timeframe.[45]   The program as marked a shift in Federal policy from providing direct subsidy for affordable housing development to tax incentives.

1988 – Fannie Mae begins financing multi-housing through its Delegated Underwriting and Servicing (DUS) network of approved lenders. In 1994, it securitizes DUS loans and creates DUS Mortgage-Backed Securities. The program marked the growing presence of the Agencies in multi-housing finance market, a trend that increased in significance over the following two decades.

1989 – Financial Institutions, Reform, Recovery and Enforcement Act of 1989 (FIRREA).
The Act introduced risk-based capital standards for savings and loan institutions. The legislation proposed new standards for thrifts nearly doubled the capital requirement for multi-family mortgages than for single-family mortgages. As a result multi-housing lending was curtailed, and thrifts began to lower their multi-housing mortgage holdings sharply. Due to the fallout from excessive construction in the multi-housing sector, the Act prohibited thrifts from providing construction and development loans where the loan amount exceeded 70% of the property's value. In particular, this severely restricted loan availability in some regions of the country.[46]   This legislation paved the way for the GSEs and CMBS lenders to provide capital to multi-housing borrowers. Thrifts were also prohibited from investing in direct real estate.

1990 - Multi-housing mortgage debt outstanding held by the agencies, or securitized in agency-backed pools reaches $41.9 billion, or 15% percent of total multi-housing debt outstanding.   Banks and Savings Institutions account for 44%, while private CMBS issuers account for less than 1%.

Early 1990s – Multi-housing loans are securitized by the Resolution Trust Corporation (RTC), in an effort to resolve problem assets from distressed lending institutions. The development helped to spur the growth of the private Commercial Mortgage-Backed Securities (CMBS) market in the 1990s. The growth of the CMBS market helped to pave the way for further growth in disintermediation from traditional banking lending channels for multi-housing debt.

1992 – Federal Government imposes several affordable housing goals for the GSEs to increase the share of mortgages involving lower income that families and underserved areas of cities and rural areas, minority, and low income areas. The extension of credit helped to boost homeownership among minority and low income households.

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[45] See Danter Company, at http://www.danter.com/taxcredit/lihtcmf.htm.   According to their analysis with how this is still in approximately 75% of LIHTC units authorized our new construction units placed in service. The remaining 25% are for renovation units, single-family units, or are not placed in service. Danter's figures adjust for these factors.

[46] DiPasquale, D., and J. L. Cummings, 1992. "Financing Multifamily Rental Housing: the Changing Role of Lenders and Investors", *Housing Policy Debate*, 3, 1:77 – 117.

1993 – Freddie Mac reenters the multi-family lending business with its Program Plus model.

1998 – CMBS securitization loan volume outstanding reaches $33 billion.   The Russian debt crisis and the collapse of Long-Term Capital Management sharply raises credit spreads, curtails CMBS lending and precipitates the collapse of CMBS b-piece buyers. Public CMBS originations stall, allowing the Agencies to capture a growing share of the market.

2000 - Multi-housing mortgage debt outstanding held by the agencies, or securitized in agency-backed pools reaches $91 billion, or 22% percent of total multi-housing debt outstanding.   Banks and Savings Institutions account for 35%, while private CMBS issuers account for 12%.

2003 - Fannie Mae fulfills its trillion dollar pledge to help 18 million families become homeowners and extended commitment to help 6 million families including 1.8 million minority families to become first-time homebuyers during the first decade of the 21st century.[47]   Such programs, along with the evolution of private "affordable" housing finance products helped to dramatically boost homeownership rates during the early 2000s.

2008 – Financial crisis intensifies with the failure of Bear Stearns and Lehman Brothers; the GSEs are placed under conservatorship. CMBS spreads widen to unprecedented levels, shutting down new origination activity. Bank lending slows due to growing distress in development portfolios. GSEs provide a liquidity backstop to the multi-housing lending market: over the course of next four years, GSE multi-housing lending portfolios continue to expand, while other sources of multi-housing debt contract.

2009 – Freddie Mac announces a new funding program, they capital markets execution, where loans are purchased specifically for securitization. Freddie Mac establishes K-Certificate securitization program for multi-housing loans.

2010 – Passage of Dodd-Frank Wall Street Reform and Consumer Protection Act. The Act provides comprehensive financial market reform that provides oversight of systemic risk from large financial institutions and establishes a Consumer Financial Protection Bureau. The Act requires risk retention for securitizations, and rating agency oversight.

2012 - Multi-housing mortgage debt outstanding held by the agencies, or securitized in agency-backed pools reaches a new high of $352 billion during the first quarter, or 42% percent of total multi-housing debt outstanding.   The Agency's book of loans is now higher than that of Banks and Savings Institutions, which now account for 29%. Private CMBS issuers' share falls to 10%, after reaching 16% in 2007.

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[47] Source: Fannie Mae, 2004. "Tackling America's Toughest Problems; American Dream Commitment 2003 Report." Washington, DC.   Available at http://www.FannieMae.com/initiatives/PDF/ADC/full2003.pdf.

Part 3 – Impact of Changes in GSEs on the Multi-Housing Market

We have been asked to determine the likely impacts on the performance of the multi-housing markets if the support provided by the GSEs is changed or removed. This task is challenging as the impact of the GSEs has been ever-present in most of the time period for which there is market data and thus the determination of the likely scenario that may emerge after a shift in the market's structure is a bit of a step into the unknown.

Impact of Changes in GSEs on Multi-Housing Property Performance

To examine the likely impacts of changes in the guarantee of GSE debt on the broader multi-housing market, we began by determining how our standard market model might be adapted to incorporate a change in market structure. This model is a system of equations from which a forecast is developed that is published in the Outlook Report of our CBRE Econometric Advisors business unit each quarter, the results of which were highlighted in the previous section on the Multi-Housing Outlook. As shown in the diagram in Exhibit 50, this system starts with input from the economy and filters through a series of equations and identities that feed into each other in a closed system. Here is the challenge, this closed system describing market behavior has at the root a number of factors impacting it that underlie the whole period of analysis used to develop the model.

The enforcement of property rights in the U.S. protects investors' returns and, most importantly for us, promotes investment in response to increases in values and rents. In this sense, the legal system in our country oils the machinery of real estate cycles. It is a situation that many times is taken for granted. Should the United States have an unfortunate structural shift in legal rights, the assumptions of our standard model that call for a certain percentage increase in construction when rents increase beyond their long-run level would need to be adjusted. In the case of the GSEs, clearly, the underlying impact that these have provided to the market has for a long time been a structural feature of the debt side of the market.

Exhibit 50 – Structure of the Standard CBRE Econometric Advisors Multi-Housing Model

Economic Factors Drive the model and are exogenous to the system of equations. Here we start with employment, population, personal income.

Absorption Equation

Net Absorption= ƒ(Lagged Occupied Stock, Real Rents, Economic Drivers)

Occupied Stock Identity

Occupied Stock = Lagged Occupied Stock + Net Absorption

Rent Equation

Real Rent = ƒ(Lagged Real Rents, Market Vacancy)

Vacancy Identity

Vacancy = 1 - Occupied Stock / Stock

Permits Equation

Permits = ƒ(Lagged Permits, real rents relative to long term trend)

Construction Identity

Construction = Lagged Permits - % Not Moving Forward

We are shocking this system of equations in this particular path. Think of each of these equations and identities as buckets of water with pipes between them. We have restricted the diameter of this pipe and plotted out the reduced flow of new supply to the vacancy identity flowing through to the rent equation where it drives up rents.

Stock Identity

Stock = Lagged Stock + Construction

Our standard market model does not have a feature of debt or capital market flows entering the system of equations. The issue here is that these features are endogenous with changes in asset values that might drive new construction, which also simultaneously changes the amount of debt in the system if LTV's remain constant.

The standard market model only allows impacts to move in one direction at a time, otherwise one cannot easily build a framework to understand how the market behaves. This said, from a theoretical perspective, if changes in debt costs or the availability of debt were to have any impact on market behavior overall, it should come through on the supply side of the market.[48]

The development of new multi-housing properties is a function of the replacement cost of assets. As rents and asset values increase rise above replacement costs, developers anticipate higher profits from new construction and begin moving projects forward in response to these increases in asset values.

Suppose then that the potential changes to the guarantee of GSE debt act as a shock that increases the cost of debt capital in the multi-housing market. There would be a myriad of impacts on the behavior of different types of lenders, changes in the way appraisal professionals value assets, changes in the way investment advisors and pension funds assess risk in the sector.

Rather than try to map out all of these potential interactions, the simple approach is to test one likely interaction on the whole system identified in our standard model. To that end, we determined that we could understand the sensitivity of new construction to lending market factors. Given some scenarios around lending market factors under various GSE scenarios, we could then adjust the supply equation and trace through the impact of supply changes on rents and occupancy in each scenario.

To determine this sensitivity, we used what is called a vector auto-regressive (VAR) model to estimate the historical impact of financial market variables on multi-housing starts. Understanding the sensitivity of the historical relationships between these variables is fundamental to estimate a model that can be used to examine a number of "what-if" scenarios looking at the impact on the multi-housing markets from various financial market shocks.

VAR models are a powerful device in the toolbox of econometricians. These models are particularly useful for describing dynamic behaviors of economic and financial trends that are inter-related. The beauty of the VAR tools is that they allow us to break out the various dependencies and focus in on only the key variables and relationships of concern while holding other factors constant.

Consider for instance the relationship we are trying to examine here between the growth in multi-housing starts and increases in the amount of multi-housing debt outstanding. Historically, starts have at times increased due to changes in Federal housing policy, changes which then in turn create more demand for multi-housing debt as more apartment units are developed and need to be financed. This relationship can move in the other direction at the same time with periods where low rates of return in other asset classes have shifted capital to the lending markets which in turn can increase multi-housing starts. These VAR models allow us to decompose these intertwined relationships and while these tools do not provide a way in which we can answer the age-old question "which came first, the chicken or the egg", they can allow us to determine the relative sensitivity in one direction when we hold the other variables constant as they emerge from the system's dynamics.

Because of this issue of intertwined relationships, VARs are extremely useful when modeling systems rather than just single variables. For instance, if one assumes that there exists a causal relationship between construction and financial markets—as we indeed do in this case—then one might be interested in capturing the interaction between these variables in order to map out what the response of one variable is once the other variable changes, as it unfolds through the system's internal dynamics.

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[48] DiPasquale, D. and W. Wheaton (1992), "The Markets for Real Estate Assets and Space: A Conceptual Framework," *Journal of the American Real Estate and Urban Economics Association*, 20(1): 181-97.

The table in Exhibit 51 maps out the structure of the VAR model used to examine the inter-relationship between financial market variables and multi-housing starts. The table in some ways can be read like a correlation matrix, but can really be considered a causal matrix. Each column represents a particular variable of interest and each row in turn reflects the relative impact of other variables. The top set of figures in each row contains the coefficient showing the sensitivity of the variable, the lower set represents the significance in the relationship in the t-statistic (values below about 1.3 should be ignored due to low significance).

Exhibit 51 – Structure of the VAR Model Employed in the Analysis

	Multi-Housing Starts	Multi-Housing Lending Rates	Outstanding Multi-Housing Mortgage Debt
Multi-Housing Starts Lag 1	0.641	-0.001	65.286
	[6.89607]	[-1.58287]	[1.29697]
Multi-Housing Starts Lag 2	0.175	0.000	-11.898
	[1.98398]	[0.43303]	[-0.24888]
Multi-Housing Lending Rates Lag 1	-18.052	1.096	-5478.797
	[-1.91833]	[11.6028]	[-1.07451]
Multi-Housing Lending Rates Lag 2	5.426	-0.243	1760.977
	[0.57168]	[-2.55098]	[0.34242]
Outstanding Mortgage Debt Lag 1	0.000368	-1.15E-06	0.328807
	[1.96714]	[-0.61184]	[3.24804]
Outstanding Mortgage Debt Lag 2	-0.000105	5.80E-06	0.311306
	[-0.55727]	[3.06473]	[3.04569]
Constant	284.846	2.997	23776.760
	[3.56350]	[3.73429]	[0.54896]
Market Vacancy	-7.284	-0.057	-636.853
	[-1.27822]	[-0.98761]	[-0.20625]

Take the value of starts lagged one period for instance. A simple correlation between starts and starts lagged one period shows a better than 96% correlation. After all, when there is a construction boom on, it has some persistence between periods. To some degree though, that high degree of correlation is explained by other factors acting on the market at the same time. In the model, the coefficients on the two lags on starts sum up to about 80% as much of the correlation between the starts in any period is actually explained by other factors.

Reading out the values from the table for the first column, the model for starts takes the form:

VAR MODEL MEASURING FINANCIAL IMPACT ON STARTS

$$STARTS = .641*STARTS_{t-1} + .175*STARTS_{t-2} -18.052*LRATE_{t-1} + 5.426*LRATE_{t-2}$$
$$+ 0.000368*DEBT_{t-1} -0.000105*DEBT_{t-2} -7.284*VAC_{t-0} + Constant$$

Where:

STARTS	Represents multi-housing starts across the U.S. (5+ units)
LRATE	Is the market lending rate from an average of the ACLI and Freddie Mac multi-housing deals weighted by the mortgage debt outstanding by each.
DEBT	Total outstanding multi-housing debt from the Fed Flow of Funds data
VAC	Multi-housing vacancy rate from CBRE Econometric Advisors

A casual reader will notice that the equation listed above omits an important measure used in the standard multi-housing market model employed by CBRE Econometric Advisors. The Real Rent figure, that is, the inflation adjusted rental price that tenants pay to occupy apartment units, is omitted. The issue here is that in our analysis, the t-stats on rent figures tested were insignificant when trying to explain starts. That statement brings up a deeper question that gets into the art of econometric modeling when trying to determine the structural relationships between variables. Why are rents used, and significant, in the standard market model but not here?

The issue of significance comes about due to the interaction with other variables. By including other variables such as market vacancy and the financial market factors in this starts relationship, we are capturing some of the market forces that are captured by the rental data in the standard market model.

The other issue here is that when modeling interactions, one looks at the data available and makes judgments on what relationships can be seen given that data. In the case of the standard market model, the purpose of that model is to estimate the relationship between variables representing market conditions within individual metro areas. There is no data tracking mortgage debt outstanding or lending rates at the local level and so to get at broad relationships, we are left with the data at hand, apartment rents, to capture all this information on the financial incentives that lead developers to build space.

With the model in place, we can run some scenarios to test out the response of the trend in starts to a shock to the debt markets that would be driven by a change in the structure of the market. The following chart breaks down a total of twelve different shock scenarios analyzed and we will break down each of these in turn. The chart shows the yearly percentage reduction in starts from the mean trend with the worst scenario leading to starts at only 73% of the previous mean trend one year after the initial shock.

Exhibit 52 – Percent Reduction from Mean Level in Multi-Housing
Starts to Various Shock Scenarios to Multi-Housing Lending
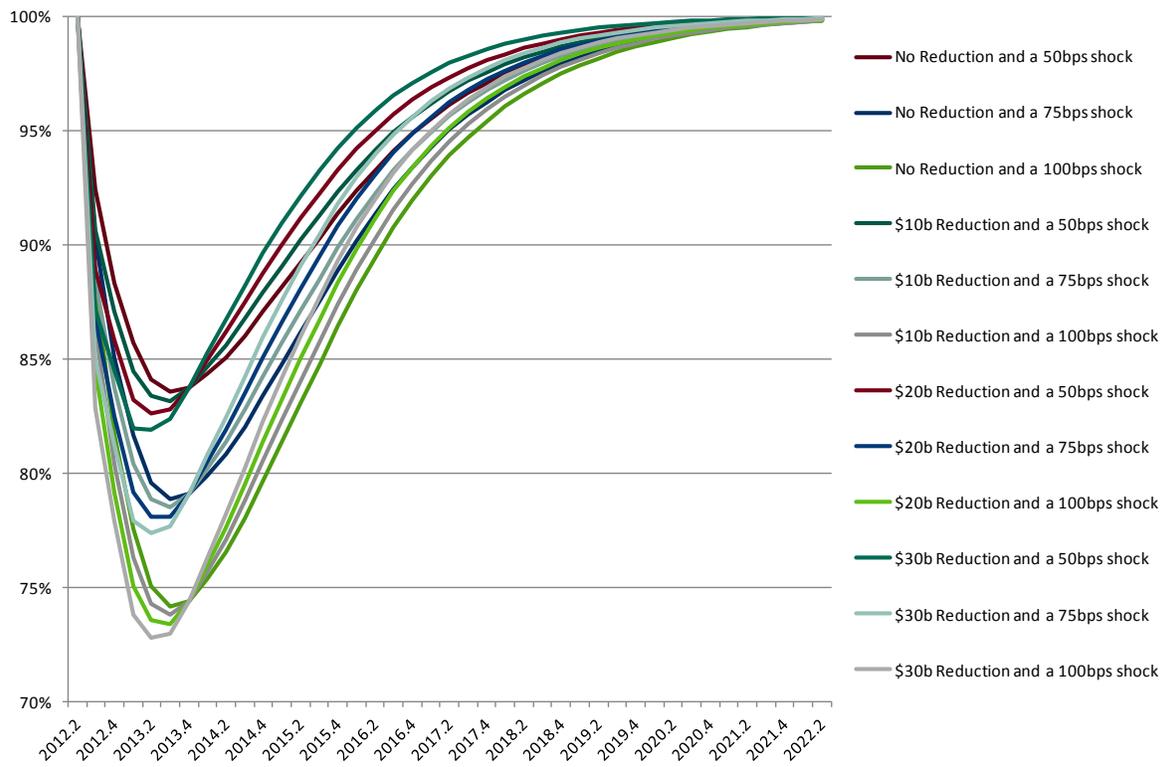
The shocks generated here have two components, first, a change in the structure of the GSEs and the government guarantees may lead to a reduction in mortgage debt outstanding for a time given reduced origination volume from the GSEs until the market responds with new sources of capital. Second, in this period of adjustment the typical lending rates go up for a time before settling back to a more normal level. The increase in rates reflects not only the market disruption, but also the loss of the GSEs' guarantee on the distribution of risk in the multi-housing lending market.

The lending liquidity shocks are examined in the case of zero change to liquidity, as in, the reformulated GSEs have as much origination capacity as before, and shocks of $10 billion, $20 billion and $30 billion dollar respectively.

Our analysis is using these $10 to $30 billion dollar ranges as scenarios around shocks to lending rather than developing an explicit, model driven approach. We have not used an explicit model as it is likely that any shocks to the multi-housing mortgage will be outside the realm of historical interactions and thus historical trends and relationships in the data may not be a precise guide with respect to the degree to which these figures will move. For this reason we look at these various ranges to reflect shocks in line with and in many cases bigger than trends historically.

In the worst case scenario we are using, there is a combination of a large shock to lending rates in addition to a $30 billion reduction in outstanding mortgage capital. This reduction represents a significant deviation from the history of this series but given that almost all of the historical volatility in the mortgage data is on the upside, this figure understates the seriousness of this impact. Such a reduction would be more shocking than any previous downturn experienced in the market. As shown in Exhibit 53, looking at the change in mortgage debt outstanding at year end from a year-earlier, there is no time in the last 40 years where such a shock has been seen.

At worst, in the period from 1990 to 1993, multi-housing mortgage debt outstanding fell $6.6 billion per year. The worst period there was 1992 which saw a $13.1 billion decline. The downturn in 2010 on the heels of the financial crisis saw a $10 billion decline in mortgage debt outstanding.

Exhibit 53 – Historical Volatility in Debt Outstanding Guides our Scenario Analysis on Lending Shocks

Change in Multi-Housing Debt Outstanding, $ billion
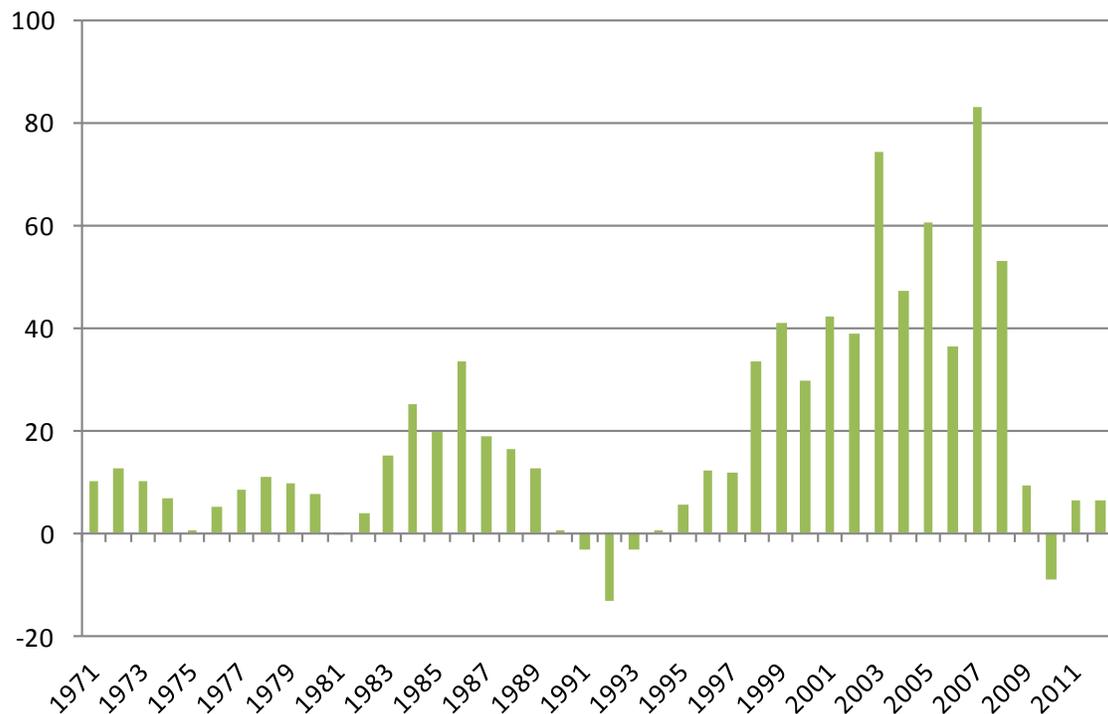
Source: Federal Reserve Flow of Funds Database

In the analysis that follows, we will focus primarily on two scenarios. This best case scenario posits a situation where the overall lending markets operate smoothly with the loss of a government guarantee representing only a minimal impact to lending costs as operators and lenders in the market struggle to figure out the competitive landscape and temporarily raise rates a small degree to compensate for uncertainty. In this best case scenario there are no interruptions and no *explicit* reductions in total debt capital available.

In all scenarios though, even when there is no *explicit* shock pushed onto mortgage debt outstanding, the shock to lending rates also tends to push down the amount of outstanding mortgage debt. The issue here is that this VAR system looks at the intertwined relationships of the variables in the system and the demand for loans is somewhat sensitive to the price of loans.

While the coefficients in the VAR model for mortgage debt outstanding have low t-stats and thus not much of a punch, the one-time shock of a 75 bps increase in lending rates will push down outstanding mortgage loans by $5 billion in the following quarter. This feature is interesting in relation to the previous statements that we have no explicit models on the supply of debt in the market. This reduction given a change in the price of debt is the expected *demand* response. This supply of debt versus demand for debt is a key issue to consider. If the guarantee of GSE debt is removed and the price of debt increases, all other things equal (ie, the same amount of lenders trying to put the same amount of dollars to work), borrowers will demand less debt.

Some persistence in reduced lending in the first period will continue into the coming years as lenders and borrowers struggle to determine their overall appetite for new, more highly priced debt. Curiously, the big downward shock to mortgage debt outstanding from the worst case scenario where outstanding mortgage capital is reduced by $30 billion, this scenario has a faster climb from the bottom than do the other scenarios. The issue here is that the model reacts positively to a downward movement in debt in preceding periods. One can think of this reaction as a case of lenders looking at a market that is now undersupplied and stepping up faster to fill the gap in unmet lending needs. All these scenarios converge to roughly the same trend two years out however.

Exhibit 54 –Impulse Response of Outstanding Mortgage Debt from a 75 bps Shock to Lending Rates and Different Scenarios on Shocks to Quantity of Lending

Reduction in Mortgage Debt Outstanding, $ Billion
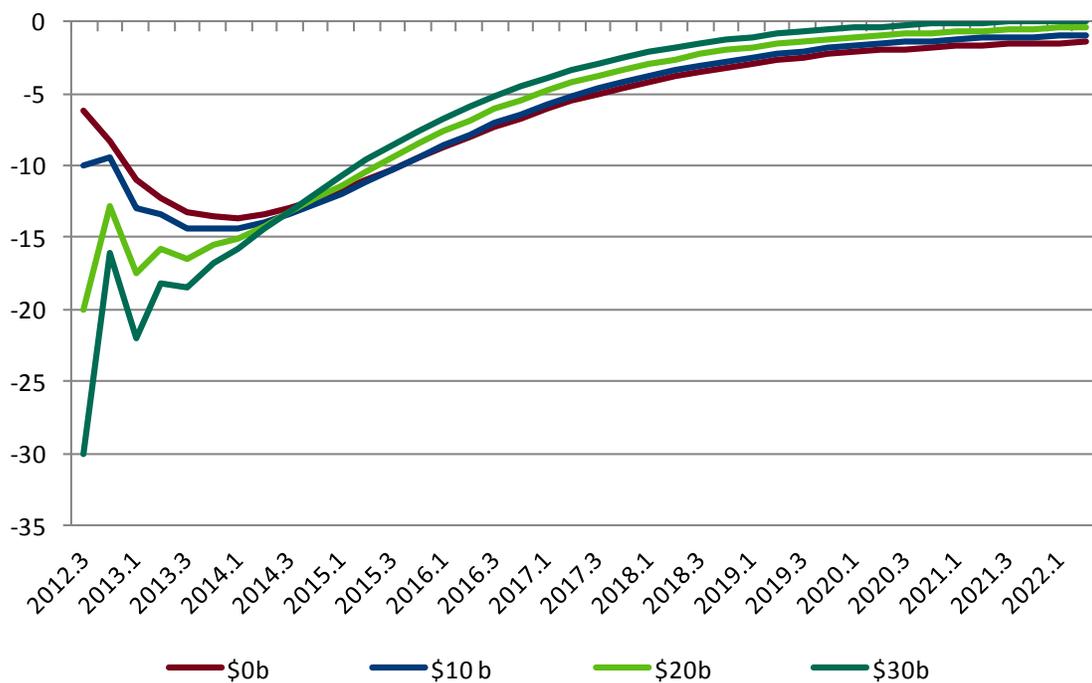
One issue that stands out here is that the interest rate shocks have more "punch" than the liquidity shocks from the reduction debt outstanding. A best case scenario of a 50 bps shock to lending rates and no corresponding liquidity shock would lead to starts at 84% of the previous mean level one year after the initial shock. In the worst case scenario with a 100 bps shock to lending rates and a $30 billion reduction in multi-housing debt, starts would be 73% of the previous mean level. The extra 50bps and the significant reduction in mortgage debt outstanding only takes an additional 11% off of starts one year ahead versus the initial 16% reduction.

Exhibit 55 – Percent Reduction in Starts from Mean Trend One Year Ahead of Shock

BPS Shock	No Reduction	$10b Reduction	$20b Reduction	$30b Reduction
50	84.1%	83.4%	82.6%	81.9%
75	79.6%	78.8%	78.1%	77.3%
100	75.1%	74.3%	73.6%	72.8%

Exhibit 56 puts these percentage figures into the context of the number of units. The overall forecast for apartment starts in the coming years is one where starts are greatly elevated from the lows seen in 2009. Still, when starts peak in 2015, our expectation is that this figure will only come in at just over 300,000 units per year. By contrast, from mid-year 2003 to mid-year 2006, these figures averaged 355,000 units per year.

Into the period from 2012 to 2017, the reduction in starts in the worst-case scenario is expected to total 236,000 units lower than the annual starts forecasts highlighted in the base case scenario in Exhibit 55. To put this figure in perspective, multi-housing starts came in at an annualized pace of 217,667 units in the 2nd quarter. By year end 2012, we expect a total of 275,270 units so the lost construction over the next five years in the worst case scenario is roughly equal to one year's worth of current supply.

Exhibit 56 –Reduction in Starts from Base Case Following Shock

Annualized Apartment Units x 1,000
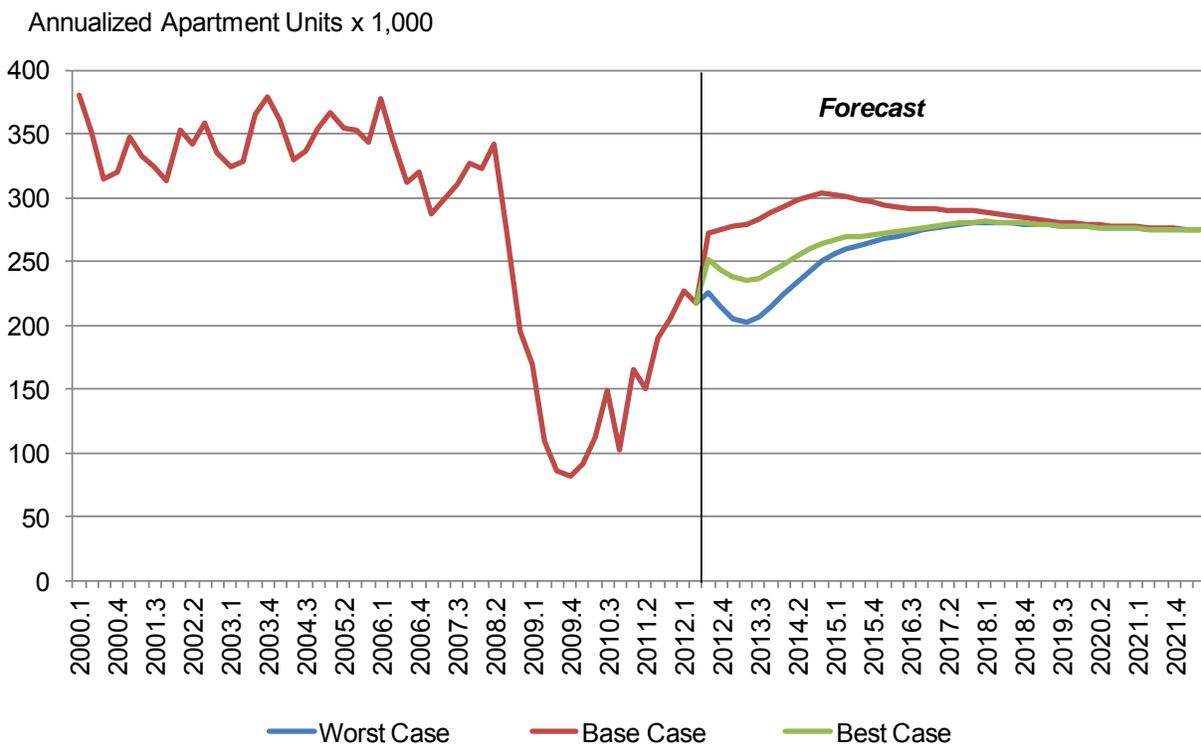
These shocks were calculated using data from across the U.S. as a whole. To measure the actual impact on rents, we need to bring these shocks into our standard market model for the 60+ market universe of the major U.S. markets where rental data is consistent. The trends for starts in this 60+ market universe are highly correlated with the trend in starts for the U.S. overall and to set these figures up as an input into the standard market model for the 60+ market universe, the scaling factors developed in the preceding table are simply applied to the trends in starts that come out of the standard market model.

Exhibit 57 – Reduction in Starts from Base Case Following Shock – 60+ Market Universe

Apartment Units x 1,000
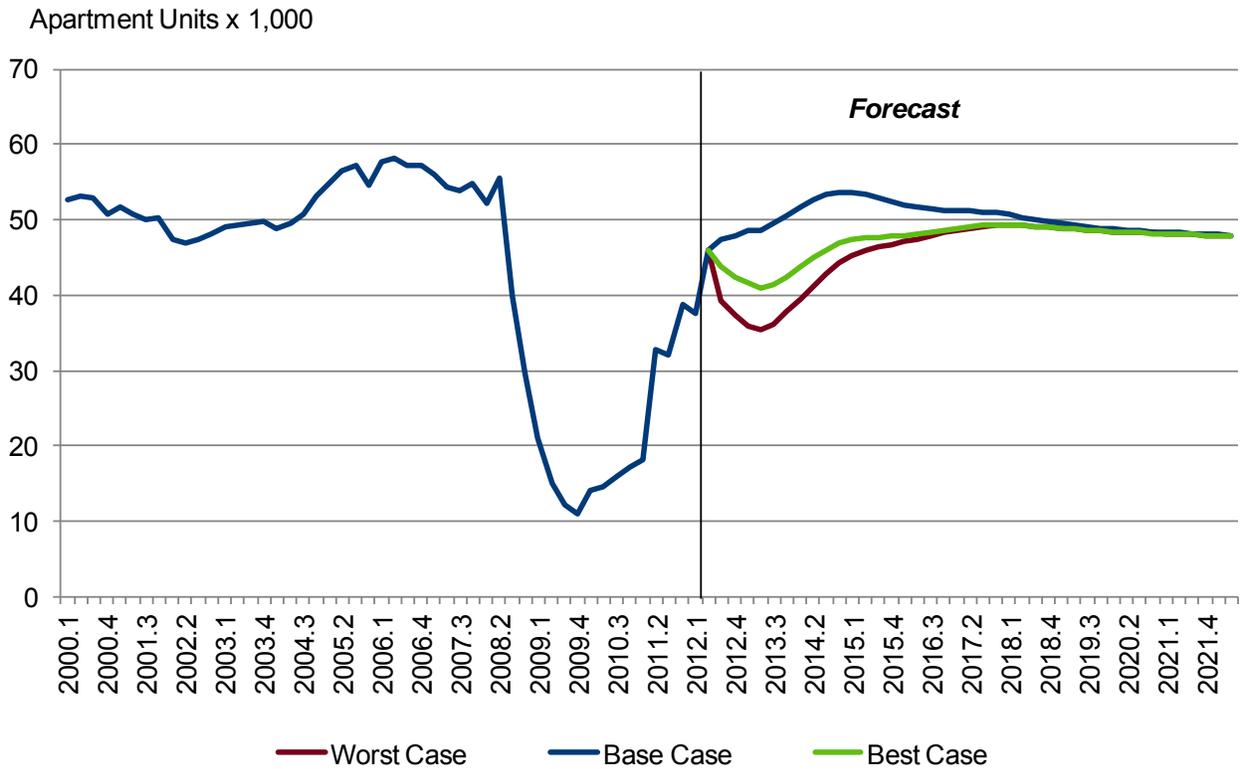
As shown in Exhibit 57, in the five years ahead of the shock assumed to come in 2012Q2, from 2013 to 2017 the standard market model is calling for an upward trend in starts with a cumulative 1,717,000 new units started. In the worst case scenario, starts only total 1,008,830 in this time frame, a reduction of 708,170 units. For purposes of comparison, assuming no shocks to the market, the combination of historical data and the results of the standard market model are calling for 178,913 units to be delivered in 2012.

Again, the VAR model on the relationship between financial variables and construction only represents an over-ride figure on top of our standard equation. Our standard equation is for permits. The typical progression through time for new stock to enter the market is to enter the permit phase first, then to become a start then later actual construction. In the standard model, our permits equation has the following form:

PERMITS EQUATION

The permits model takes the following structure:

$$PERMITS = 47.5329 * RRENT_{t-1} + 2.1250 * EMP_t - 1.9624 * EMP_{t-1}$$
$$+ 0.8673 * NONEG_{t-1} - 0.1164\ NONEG_{t-4}$$

Where:

RRENT	Represents inflation adjusted apartment rents
EMP	Is total employment
NONEG	A variable used to control the forecast equation to prevent negative starts

And $_{t-1,\ t-2,}$ etc. denote the various quarterly lags on variables (zero quarters, 1 quarter, 2 quarters etc.)

The innovation here with the VAR model and how it interacts with our standard model is highlighted in Exhibit 58. This diagram is similar to that used in Exhibit 50 but some more meat is on the bones here and the various equations used are tied back to the specific page numbers used in this report. As we move from this VAR model which represents an over ride on top of this standard model of starts to simulating the impact of shocks to the market on variables such as rents and demand for space, this diagram shows that the VAR model is the mechanism for delivering this shock to the market overall. Again, permits move to starts which then become actual construction. The VAR model throttles back the starts that would have come out of the permits equation given the impulse response to various scenarios around Lending Rates and Debt Outstanding.

Exhibit 58 – Structure of the Multi-Housing Model used in these Simulations
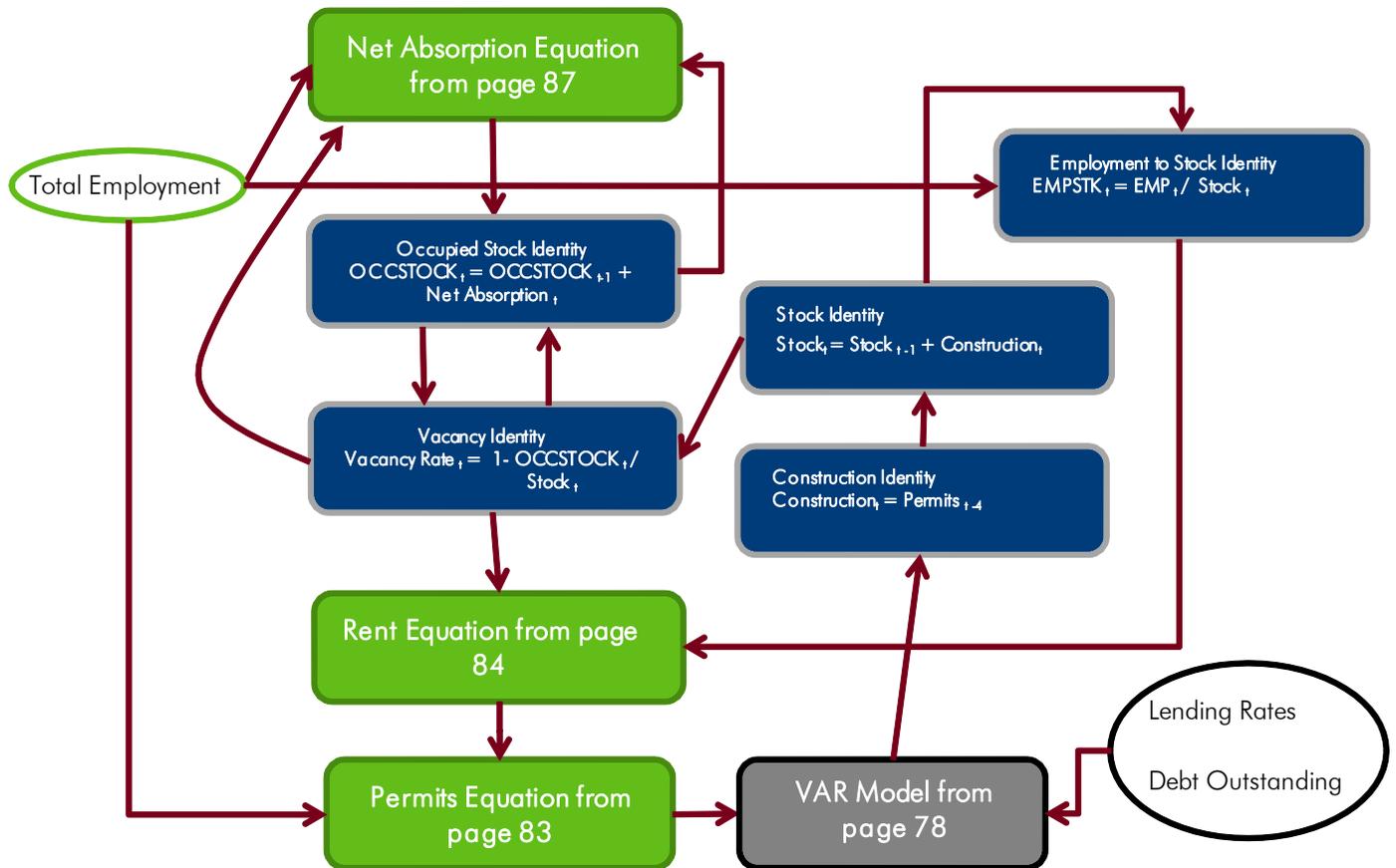
One way to interpret the results of the worst case scenario is there would be a cumulative impact of new starts equal to nearly one year's worth of supply over a five year period. If supply is reduced this much, tenants will have fewer options from which choose, vacancy rates will decrease and rents will increase as the market matches the more limited supply with the demand in place. The degree to which these changes impact rents come in over time gradually.

RENT EQUATION

The rent model takes the following structure:

$$RRENT = 0.9826 * RRENT_{t-1} - 2.6385 * VAC_t + 32.9465 * EMPSTK_{t-1}$$
$$-31.2090 * EMPSTK_{t-5} + 27.4877$$

Where:

RRENT	Represents inflation adjusted apartment rents
VAC	Is the apartment vacancy rate
EMPSTK	This is the ratio of total employment to the stock of apartment units

And $_{t-1,\ t-2,}$ etc. denote the various quarterly lags on variables (zero quarters, 1 quarter, 2 quarters etc.)

The EMPSTK variable represents an attempt to have the impacts of the reductions in new starts brought through to changes in market rents. This variable is a slight variation from the standard market model used in the CBRE EA Outlook report. In the baseline forecast, typically changes in occupied stock, in other words, realized demand, are fed to through to rent trends. Here, employment relative to stock tracks the potential demand for space. Imagine for instance if no new construction were to come to the market yet employment continued to grow. As shown in Exhibit 59, when the ratio of workers to apartment units rises, rents will begin to adjust upward as well with workers facing fewer options for housing. This feedback loop will be a key feature to track the impact of reduced starts on the market in a framework within which starts may decline to a far greater degree than in any part of the history we track.

Exhibit 59 – Feedback Mechanism from Reduced Starts to Impact on Market Rents
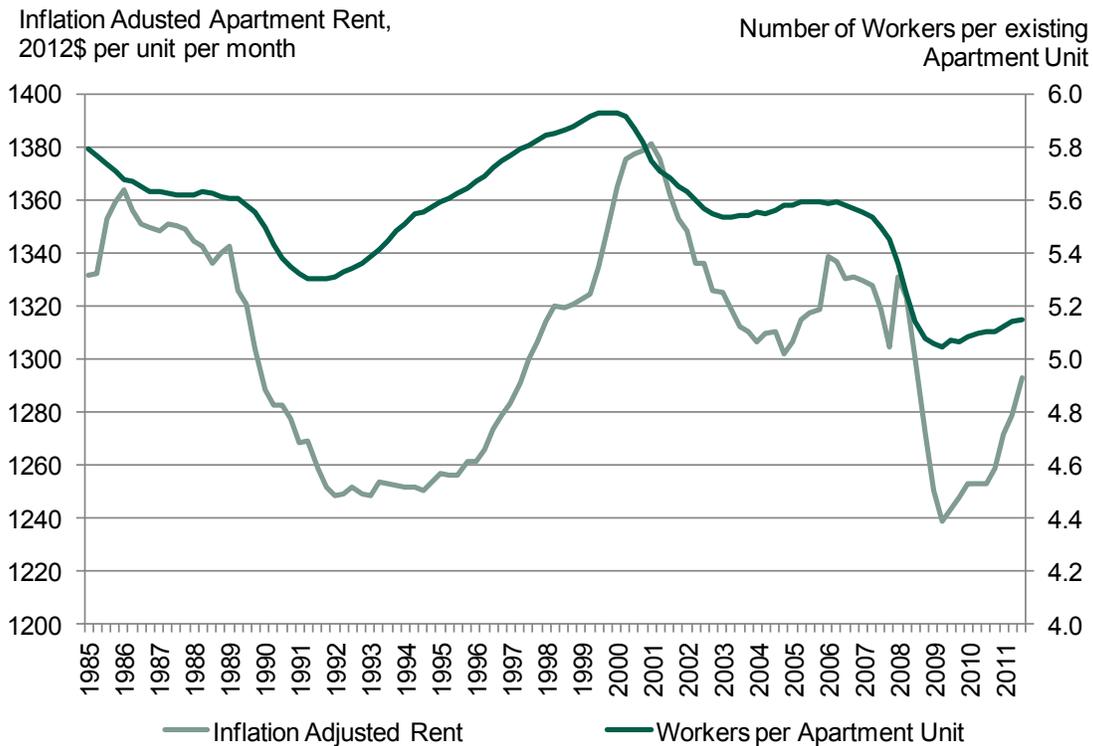
Sources: CBRE EA Outlook Report, CBRE Research Calculations

Exhibit 60 –Rent Impacts in Standard Model from one-time Shocks: Best Case Scenario

Percent Difference in Rents   Rents, $ per unit Per Month

Percent Difference in Rents   Base Case   Shock Scenario
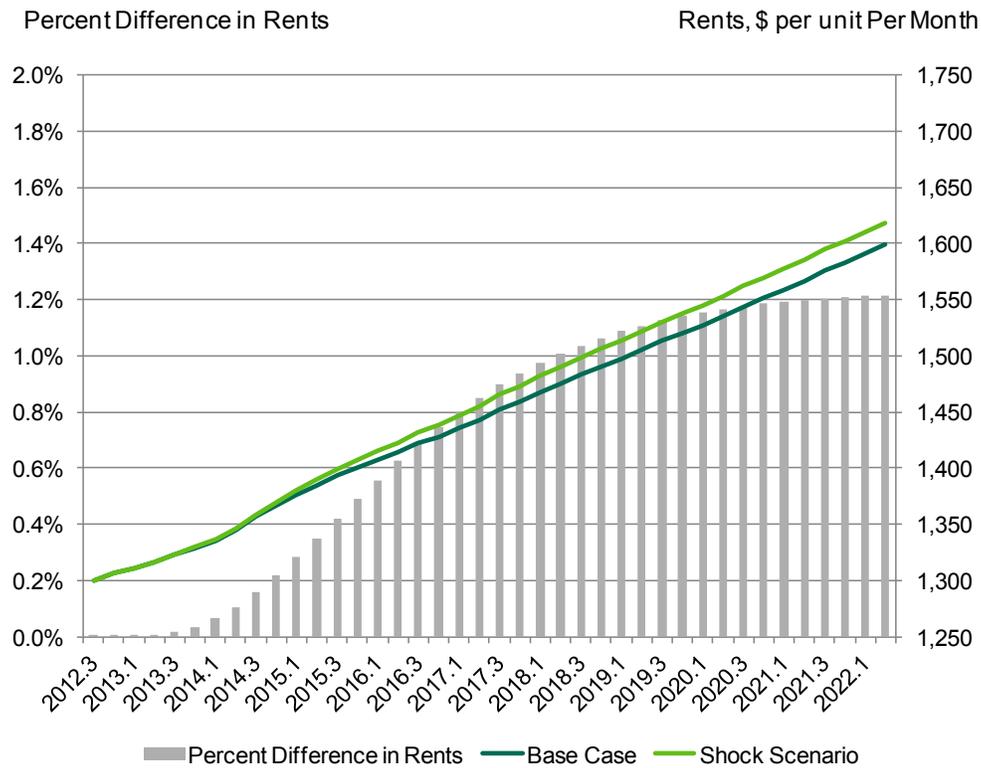
Exhibit 61–Rent Impacts in Standard Model from one-time Shocks: Worst Case Scenario

Percent Difference in Rents   Rents, $ per unit Per Month

Percent Difference in Rents   Base Case   Shock Scenario
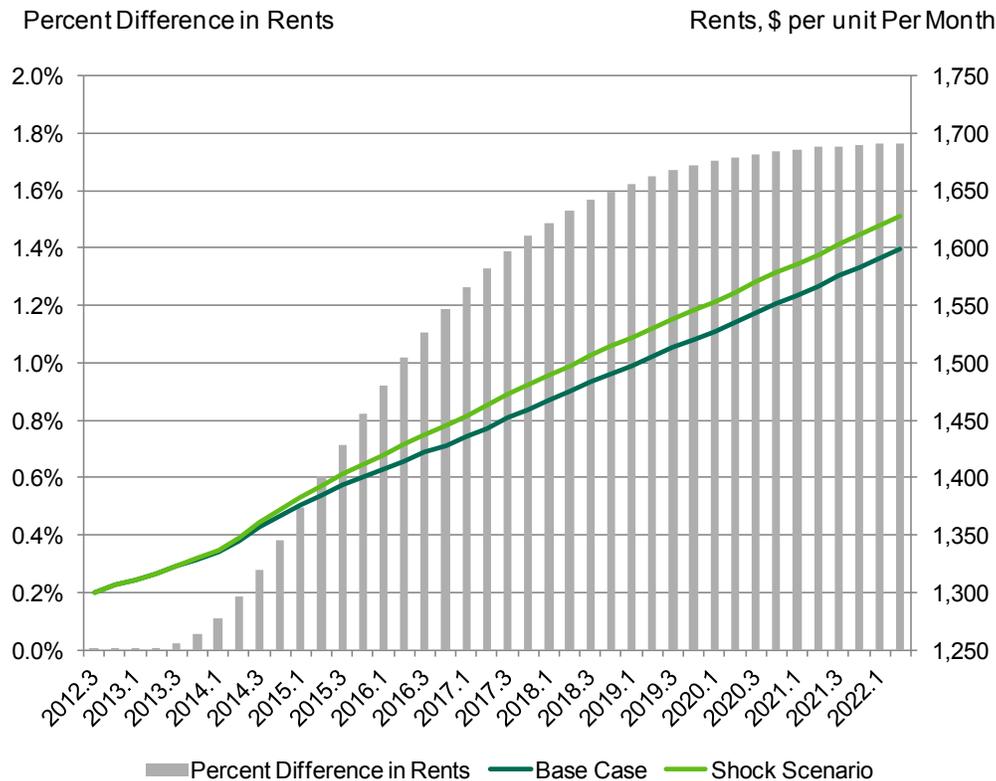
As shown in Exhibits 60 and 61 however, the rents begin to grow only a little more quickly in the shock scenarios than in the base case scenario. In the worst case scenario, rents would be just under 1.8% higher than in the base case ten years out assuming that all other inputs to the standard market model remain the same.

In some respects one might expect that rents would be more responsive to such supply shocks. The challenge here is that other elements of the system of equations we use in our standard market model change when other parts of the equation change. Consider for instance that in addition to other factors, net absorption is a function of vacancy rates. As vacancy falls, so too will net absorption for with the amount of available units shrinking, the ability to find the right apartment becomes more limited.

NET ABSORPTION EQUATION

The net absorption model takes the following structure:

$$ASORB = 54.9356 * EMP_t - 50.765 * EMP_{t-1} + 24{,}309.572 * VAC_{t-1}$$
$$- 0.0186 * OCCSTOCK_{t-1} + 241{,}374.805$$
$$+ 83{,}289.558 * Q1 + 101{,}254.407 * Q2 + 116{,}097.412 * Q3$$

Where:

ASORB	Captures the net absorption of apartment units
EMP	Total employment
OCCSTOCK	Represents the stock of occupied apartment units
VAC	Is the apartment vacancy rate
Q1	Dummy variable capture unique seasonal first quarter influences on demand
Q2	Dummy variable capture unique seasonal second quarter influences on demand
Q3	Dummy variable capture unique seasonal third quarter influences on demand

And $_{t-1, t-2,}$ etc. denote the various quarterly lags on variables (zero quarters, 1 quarter, 2 quarters etc.)

This model for net absorption is what is known as a stock adjustment model. The concept here is that there is a certain amount of occupied stock in the market today, but due to various frictional items, this figure is not in line with the true desired stock given the number of jobs and overall availability of units in the market. The net absorption seen in any one period is an adjustment toward the desired number of units in the market. It is possible, if somewhat crudely, to approximate various elasticities of absorption from the coefficients highlighting the relationship between the variables in the equation.

Net absorption is the change in occupied stock, so in a very generalized framework, we can take the net absorption model:

$$ASORB = \beta * EMP_t - \delta * OCCSTOCK_{t-1} + \text{other variables...}$$

Where δ and β are the coefficients on these variable shown in the preceding Net Absorption Equation. This simplified formula can be reworked as:

$$ASORB + \delta * OCCSTOCK_{t-1} = \beta * EMP_t$$

And solving out for δ:

$$\frac{ASORB}{\delta} + \frac{\delta*\ OCCSTOCK_{t-1}}{\delta} = \frac{\beta * EMP_t}{\delta}$$

Becomes:

$$\frac{ASORB}{\delta} + OCCSTOCK_{t-1} = \frac{\beta * EMP_t}{\delta}$$

This component of the equation:

$$\frac{ASORB}{\delta} + OCCSTOCK_{t-1}$$

can be interpreted as the desired long-run stock of units holding all other factors constant. We will call this desired stock OCCSTOCK*. The coefficient δ can be thought of as a term measuring the frictional issues in the market limiting the adjustment of occupied stock to the desired long-run level. So finally, we are left with:

$$OCCSTOCK^* = \frac{\beta * EMP_t}{\delta}$$

And with that relationship, we can take the coefficients from the Net Absorption equation on the previous page and calculate the long-run demand as it relates to jobs. The sum of the coefficients on employment as a ratio to the occupied stock coefficient 0.224 shows us the elasticity of absorption with respect to employment growth. In other words over the long-run it takes roughly five new jobs to be created to generate demand for one additional apartment unit.

Coefficient on EMP_{t-1}

Adjustment for Scale of Variables

Coefficient on EMP_t

Elasticity of Demand with Respect to Employment $= -1 * \left[\dfrac{(54.9356 - 50.765)}{-0.0186} \right] \Big/ 1{,}000 = 0.244$

Coefficient on $OCCSTOCK_{t-1}$

Using this same approach with vacancy rates, for every 100 bps increase in vacancy rates, demand for apartment units will increase by 13,078 units. More availability generates its own demand as tenants who were previously in substandard housing or living with roommates were able to find units. These demand related impacts are a key feature of the way the housing market will adjust to any shocks to new supply in the market today.

Over the history from the 1st quarter of 1986 to the 2nd quarter of 2012, the multi-housing vacancy rate in the U.S. has averaged 5.3%. In the 2nd quarter, the trailing four quarter average figure stood at 5.0%. So the apartment market today is tighter than the average seen over the last 25 years. Little wonder then that rents have been growing at such a strong pace in recent quarters.

In 2010 rents were still declining for most of the year due to the challenges of the Financial Crisis, but by year end were 1.4% ahead of the price levels seen a year earlier. By the end of 2010 this figure stood at 4.7%. By mid-year 2012, rents were already 5.0% ahead of the level seen a year earlier. Clearly the market has seen surging rents as vacancy has fallen below long run averages. Falling vacancy creates scarcity and with fewer options tenants have little time to search for apartments and must pay up for suitable apartments earlier in their search process rather than taking more time to be choosy. The price increases seen to date though are beginning to impact the overall demand for space.

Were we to run the net absorption model using rents as opposed to vacancy rates, the coefficients from the model would give us the price elasticity of absorption of apartment units. We cannot run an absorption model that includes both rents and vacancy rates for as shown with the VAR model, only one of these series can be used at a time to capture the dynamics from the leasing market.

From an adjusted net absorption model that uses rents instead of vacancy rates, we find that for every 1% change in inflation adjusted apartment rents, demand for units would be down 19,051 from what would otherwise be seen given a steady availability of units and no changes in jobs. By mid-year 2012, inflation adjusted rents were already 3.2% ahead of the level seen in 2011. Net absorption into the four quarters to 2012q2 stood at 166,647 units. This analysis suggests that had rents not grown so quickly in this period, holding everything else but jobs equal, demand would have come in at 224,181 units.

Exhibit 62 –Demand Impacts in Standard Model from one-time Shocks: Best Case Scenario

Annual Net Absorption, units x 1,000
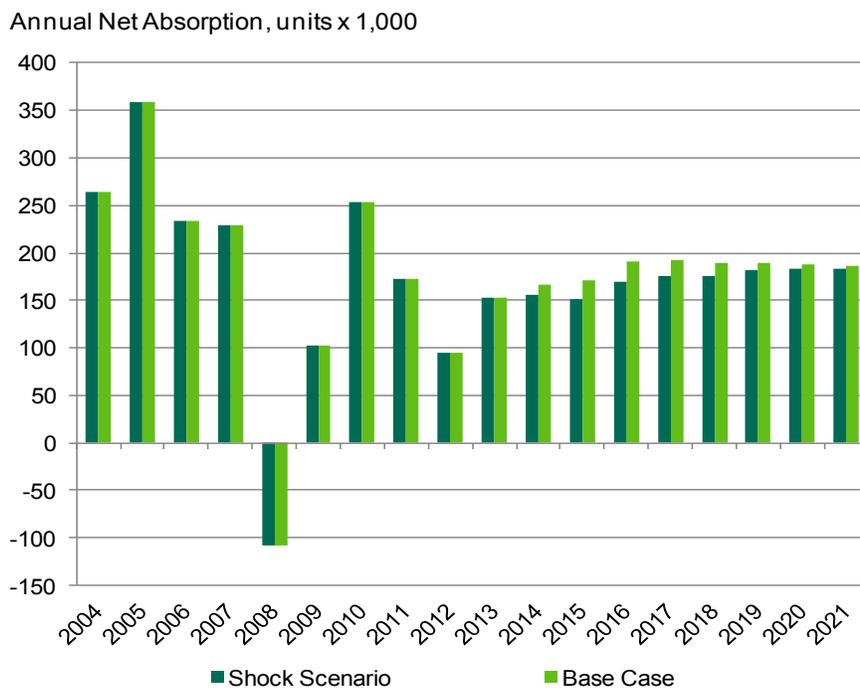
As rents grow, those consumers who would be tenants in apartment units begin to consider other options. These potential tenants ask themselves questions like *"Should I pay more to live on my own?"* or *"Can I stand to have a roommate in an apartment and save money?"* or *"With mortgage debt so cheap, can I afford to buy a house now?"* or even *"Can I live with my parents a little while longer and save money?"* The answer to these questions is fairly easy in markets and in time periods when apartment units are plentiful and rents are relatively inexpensive. However, with the market today it will be difficult for demand to continue to grow at the previous pace.

Exhibit 63 –Demand Impacts in Standard Model from one-time Shocks: Worst Case Scenario

Annual Net Absorption, units x 1,000

■ Shock Scenario   ■ Base Case
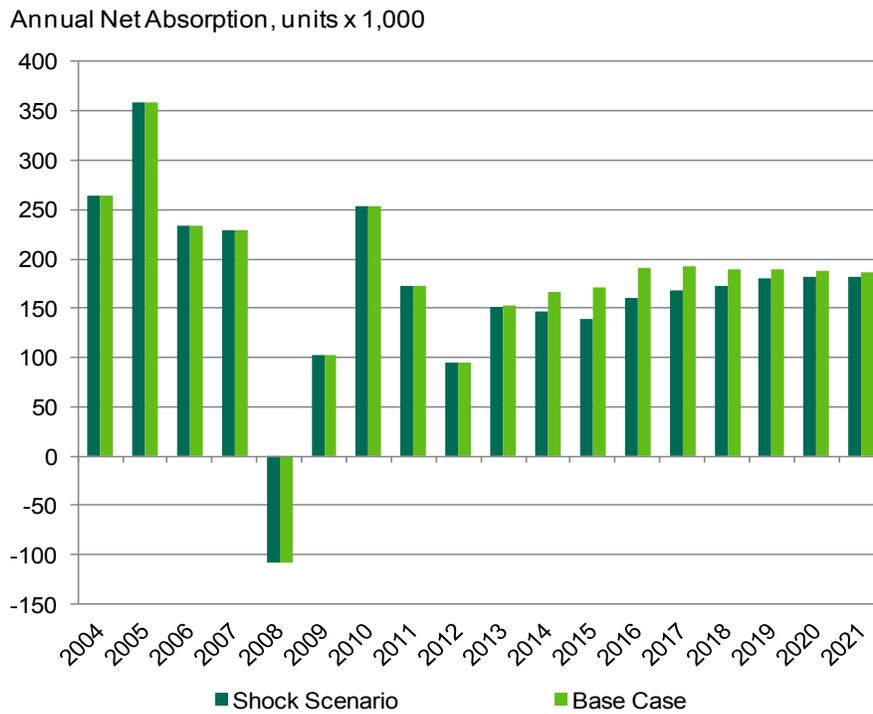
With market vacancy so low today and rents climbing rapidly, tenants are changing the ways they approach the apartment market. With employment up 1.4% from a year earlier in mid-year 2012, one might expect demand for housing to be up as well but net absorption in the 2nd quarter was 25% lower than it was in the same quarter in 2011. The fact that rents were up 5% from a year earlier in mid-year 2012 shut down an element of demand that would have otherwise occurred.

Exhibit 64 –Vacancy Impacts in Standard Model from one-time Shocks: Best Case Scenario

Vacancy Rates, %

——Base Case   ——Shock Scenario
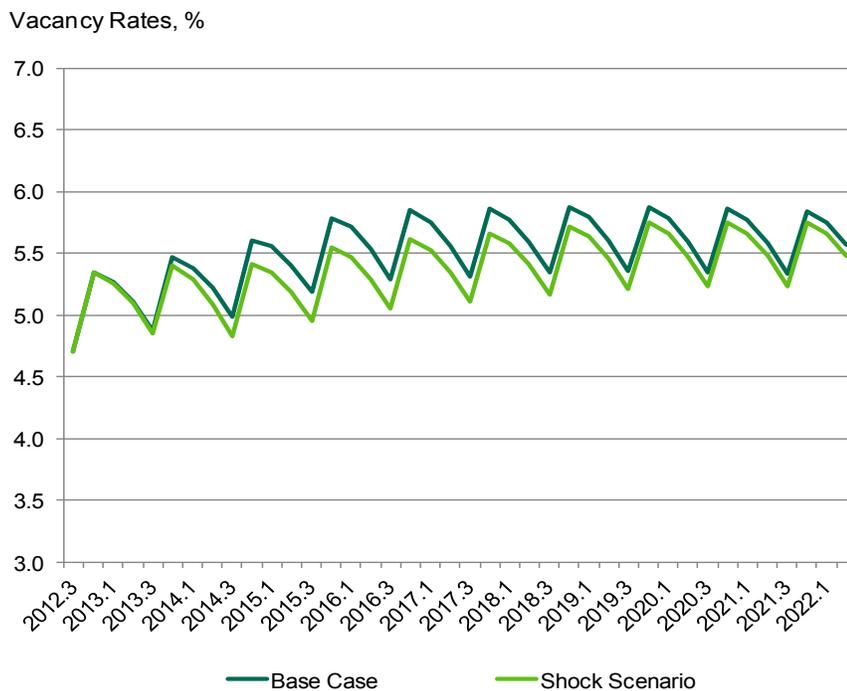
Exhibit 65 –Vacancy Impacts in Standard Model from one-time Shocks: Worst Case Scenario

Vacancy Rates, %
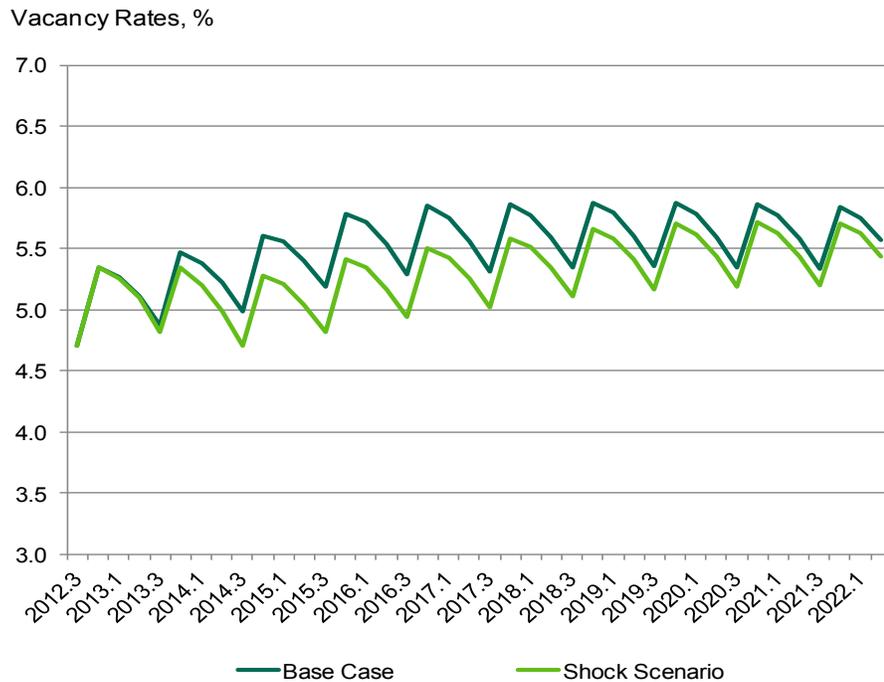
Given this impact that a tight market and growing rents has on demand in the current market, further curtailment of supply will have little ongoing impact on the apartment market. As shown in the preceding charts, as starts decline and rents increase, demand reacts quickly as well. Between 2013 and 2017 in the worst case scenario, the demand for apartment units comes in at 766,389 over the time frame compared to 872,882 in the base case forecast. Supply is reduced 146,821 units and demand comes down a total of 106,493 units. With these differences, the total change in supply that might impact overall market vacancy is only 40,328 units, roughly 8,000 units per year. As shown in the vacancy slides, this relatively small movement in the potential demand for units does not change the vacancy outlook dramatically.

Again, a big part of the issue here is timing. Given the fact that the multi-housing market is so tight today and growing rents are already having an impact on tenant demand, there simply is not enough room in the budgets of many households to absorb additional increases in apartment rents. With the state of the market today, any further increases in market rents will be met by decreases in overall demand, which in turn will limit the ability to see spikes in market rents moving forward.

Structural Changes to Tenure Choice

The analysis thus far has had another underlying assumption that can have a significant impact on the longer-run trends for the multi-housing sector. Again, the models employed in our analysis of the multi-housing market develop relationships between data points by looking at long run trends. If a variable is excluded directly from this analysis, the underlying assumption is that this variable will move back to some sort of long-run trend. In the case of the tenure choice for households, it is not clear that a key financial factor driving this decision will in fact revert to some sort of long run trend.

The base forecast presented in the CBRE-EA Outlook report looks at the changes to single-family financing as part of the usual cyclic downturn and recovery we have underway. The underlying assumption is that while it is challenging to get some types of loans today, this is a temporary market feature.

For many households, the rent versus buy decision is really a financial decision and changes in the operation of the market in recent years have lowered the availability of single-family mortgages. Granted, some headline benchmark figures such as the average 30 year fixed mortgage rate reach record low levels, but lending terms are far tighter than in the past which limits the ability of many households to consider a home purchase today. Many renters in the market today are renters by necessity and the outlook presented thus far assumes that many of these households will revert back to the single family ownership market in the near future. What if instead of a temporary, cyclic tightening of lending standards, the current situation represents a permanent structural change in the standards applied to home loans?

Exhibit 66 –Multi-Housing Demand is inversely Related to Laxity of Single Family Financing

Single Family Loans issued with 90% + LTVs, %   Year over Year growth in Multi-Housing Stock, %

Legend: —— Percent of high LTV Loans   —— Annualized growth in Apartment Demand
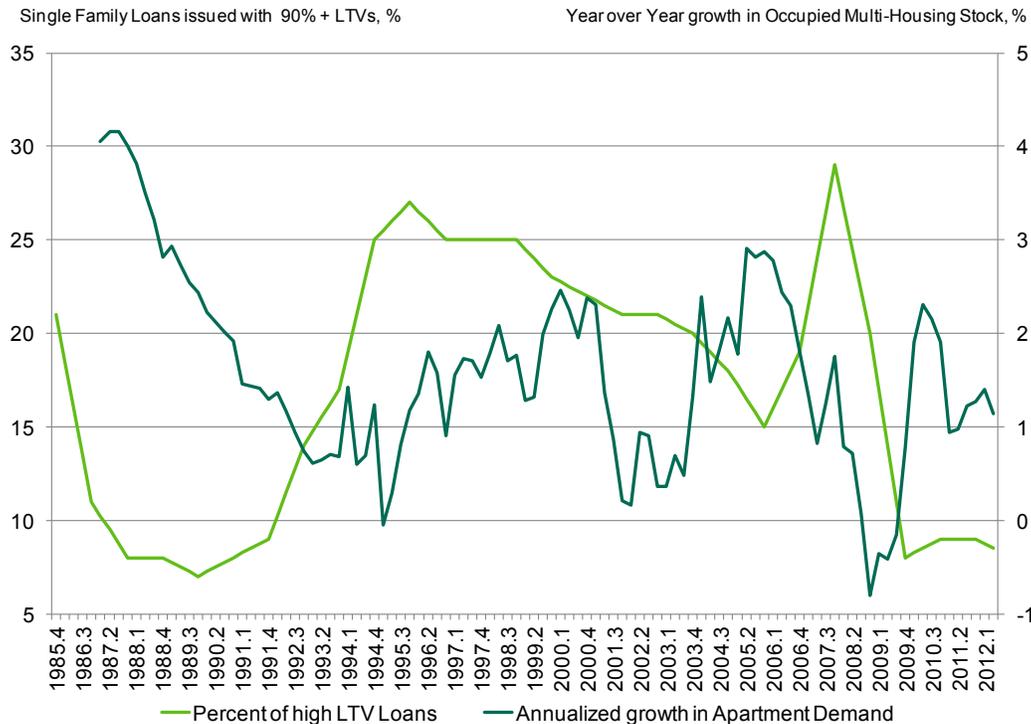
Sources: CBRE EA Multi-Housing Outlook Report, FHFA Monthly Survey on Rates and Terms on Conventional Single-Family Non-Farm Mortgage Loans

Trends in the single-family market are vitally important to forming an understanding of trends in the multi-housing market simply as a function of scale. If 64% of households are homeowners, pricing and financing trends in this market will dominate all types of housing. As shown in Exhibit 66, the growth in demand for apartment units is inversely related to the terms of single-family financing. Into 1995 for instance, as more than 25 percent of all new single family loans completed in the U.S. came in with LTVs 90% or greater, the trend in demand for multi-housing units, while positive, was at a reduced scale compared to previous years.

Likewise, into 2010 and 2012 as lending terms for single-family loans tightened dramatically, rental demand climbed sharply. In the period from 2010 to 2012, just under 9% of all new single-family loans had LTVs at levels 90% or greater. Many more home loans simply required significant down payments as part of the tightening of the credit markets. If this tightening were to continue into the future, with less than 9% of all new loans seeing LTVs at levels 90% or greater, how would demand react in the multi-housing market?

To answer this question, the impact on demand for multi-housing from structural changes in single-family financing can be examined within the context of our models of net absorption. By introducing a different structure to our net absorption model, we can test the sensitivity of demand shown graphically in Exhibit 66.

This net absorption model designed to include factors of tenure choice takes the following structure:

$$ASORB = 88.9270 * EMP_t - 61.6731 * EMP_{t-1} + 34,875.8554 * VAC_{t-1}$$
$$- 0.0805 * OCCSTOCK_{t-1} - 6,972.1059 * LTV90P_t - 1,085,624.289$$
$$+ 74,286.122 * Q1 + 91,425.432 * Q2 + 93,489.474 * Q3$$

Where:

ASORB	Captures the net absorption of apartment units
EMP	Total employment
OCCSTOCK	Represents the stock of occupied apartment units
VAC	Is the apartment vacancy rate
LTV90P	Percent of newly issued single family loans with an LTV of 90% or greater
Q1	Dummy variable capture unique seasonal first quarter influences on demand
Q2	Dummy variable capture unique seasonal second quarter influences on demand
Q3	Dummy variable capture unique seasonal third quarter influences on demand

And $_{t-1, t-2,}$ etc. denote the various quarterly lags on variables (zero quarters, 1 quarter, 2 quarters etc.)

This model for net absorption is also a stock adjustment model. The net absorption seen in any one period is an adjustment to the existing stock of occupied units in the market. The setup of the equation gives us an ability to interpret the relationship between the variables by looking at the relationship between the coefficients.

The LTV90P coefficient as a ratio to the occupied stock coefficient shows us the elasticity of absorption with respect to single family financing standards. It shows us that for every 100 bps decrease in the number of new high LTV single family loans made, demand for multi-housing units will increase by some 86,617 units in the current market. Using this model, we can run a scenario in which this tight lending standard market is permanent feature of the housing market and continues to shift households into the multi-housing market as renters by necessity.

Substituting this revised version of our net absorption model into the standard set of equations that constitute our overall model of the multi-housing market, we can test the implications of not just one, but two potential changes in the structure of the multi-housing market. Exhibit 66 plots out three different rent growth forecasts using three different scenarios.

The first scenario in blue in Exhibit 67 is simply the forecast published in the CBRE EA Outlook report. This forecast has our apartment rent index growing from roughly $1,300 per unit per month in 2012 to about $1,600 by 2022. This increase is not a minor change, it is a forecast for average annual rent growth on the order of 2.15% per year over ten years, this at a time when overall inflation is expected to be between 2.5 to 3.0% per year. On average over the next three years, apartment rents increase 0.3% faster than overall inflation but on average over ten years, rental costs will actually come down somewhat given the pace of new supply coming to the market and loosening of housing finance standards.

The grey line in Exhibit 67 exhibits a forecast that includes the impact of the response from the net absorption model shown above and assumes that lending standards over the next ten years will stay as tight as those seen in 2012 where only 8% of all new single family loans have LTVs in the 90% plus range. This scenario leads to rents that are 10.4% higher in 2022 than the baseline published in the CBRE EA Outlook Report.

The rent growth from this scenario averages 2.95% per year over the next three years and 3.14% per year over a ten year period. The story here is that constraints on housing choice that would come about by reducing the liquidity in the lending markets for the single family sector would boomerang strongly into the multi-housing sector. These costs of rental housing growing faster than inflation over the long term do not yet include the impact of the potential reductions in supply that would accompany the changes being analyzed.

A final scenario includes the impacts of both a permanent shift in the lending standards in the single family market plus the impacts of restrictions on supply from a shock to the multi-housing market from a change in the guarantee structure of the GSEs. As shown in the previous section of the report, this is a shock that would limit construction by increasing risks for developers around the take out as they try to sell assets after they are developed and leased. In this scenario which combines two structural shocks to the market, rents are 12.4% higher in 2022 than in the baseline published in the CBRE EA Outlook Report. This scenario results in rent growth averaging 3.13% per year over the next three years and 3.35% per year over the next ten. To put these figures in perspective, the growth rates translate to costs growing anywhere from 105 to 115 basis points per year faster than overall inflation suggesting that renters would face more severe constraints in their housing than in other parts of their overall household budgets over this time frame.

Exhibit 67 –Rent Forecast Scenarios under different Changes to Market Structure
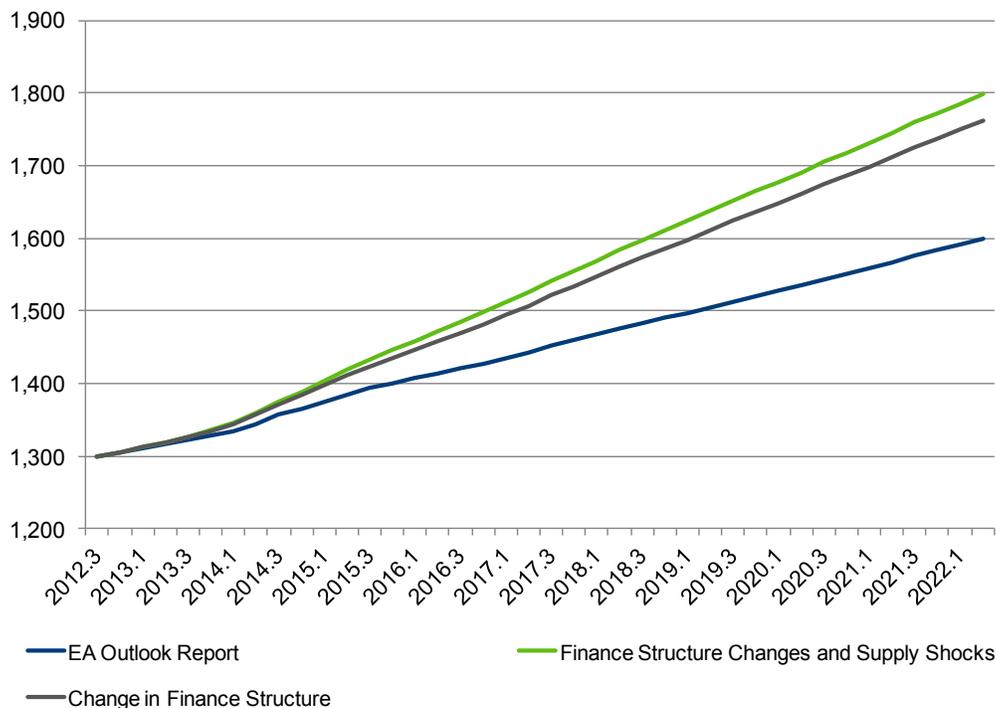
The difference between the scenario labeled "Change in Finance Structure", the grey line, and "Finance Structure Changes and Supply Shocks", the green line, is really the same issue of the demand sensitivity with respect to price examined in the previous section. If changes in the structure of the single-family lending market push a large number of households to be renters by necessity rather than choice, the biggest changes in rent would be from adjustments on the demand side of the market rather than the supply side. Supply restrictions have less of an impact as households have some ability to change their housing choices if this were the only feature of the market to change. Limit choices by forcing more households to rent rather than own, and rents will increase as the range of choices become limited.

Impact of Lending Rate Shocks on Multi-housing Property Values

In order to assess the impact of potential multi-housing lending rate increases on property values, we utilized a simple model of a typical multi-housing property's capital structure. Using the so-called "Band of Investment" or Mortgage-Equity valuation measure, we are able to derive implied equity yield, based on current lending terms and apartment capitalization rates. The measure assumes 75% debt and 25% equity, and a 10-year, 30-year amortization loan based on the average lending rate and the average capitalization rate on apartment transactions closed during the second quarter of 2012.

We assume that the lending rate increases by incremental levels of 50, 75, and 100 basis points, consistent with the range of scenarios presented above. We present the effects of a multi-housing lending rate shock in Exhibit 68. There are two cases: one where a higher cost of debt only is assumed, and another where both debt costs and the required equity yield increase. In the latter case we assumed that required equity yields increase in proportion to the basis point lending rate shock. Using the new lending rates and required equity yields, we are able to calculate a new capitalization rate, which reflects the weighted average cost of debt and equity under the Band of Investment technique.[49] A representative net operating income is then divided by the capitalization rate in order to derive an updated value estimate and corresponding change from the base case assumption of no lending rate increase.

As Exhibit 68 shows, value declines range from just over 4% to under 12% under the two different set of assumptions. This is a rather simplistic approach to determining potential value changes, as it uses very simplifying assumption as to how required equity yields change in response to the shock. Investor expectations may be significantly altered, especially in light of the fact expectations regarding capital availability for a property sale or refinance at the end of the loan term may be significantly diminished. Furthermore, there may be more complicated market dynamics that influence value changes over an extended period; this analysis assumes that values move immediately and fully in response to a shock.

Exhibit 68 – Potential Multi-Housing Value Change from Interest Rate Shocks

Percent Change from Base Case		
Multifamily Lending Rate Shock (bps)	Higher Cost Of Debt	Higher Cost of Debt and Equity
50	-4.1%	-6.0%
75	-6.1%	-8.8%
100	-8.1%	-11.4%

Conclusions

The assumptions that go into an econometric model are built up from the trends in historical data which moves within a certain band. We have used a VAR technique to determine the relationships between these historical figures and we can use the resulting model to make some predictive statements about conditions that would play out under various scenarios where the system is shocked. This said, with the larger liquidity shocks posited here greater than any previously experienced, it may be the case that the market may react more strongly to these bigger shocks. We cannot know since it is outside the realm of historical experience. Still, assuming that these relationships hold, we can draw some conclusions on the impact of potential shocks to the multi-housing market from changes in the guarantee provided to multi-housing debt issued by the GSEs.

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[49]For more details and application of this technique please see "Capitalization Theory and Techniques", the Appraisal Institute, 3nd Edition, 2009. For the debt costs we assumed a 75% loan to value mortgage with a 4.01% coupon, a 10 year term and 30 year amortization term, which reflects a 5.74% loan constant. We assumed a 6.1% capitalization rate, which implies a starting equity yield of 7.19%.

Our modeling methodology allow us to trace through the impact of an interest rate and liquidity shock on the multi-housing fundamentals:

- Nothing in the market exists in a vacuum. Shocking lending rates and the availability of mortgage debt will have impacts on valuations and the incentives that developers have to build space.

- In our worst case scenario, these shocks reduce starts over a five year period in an amount roughly equal to one year's worth of new supply.

- These shocks to supply reverberate to vacancy levels with vacancy taking a lower trend than would be seen without the shocks.

- The lower vacancy however will begin to shut off some element of the demand for space: the market cannot absorb multi-housing units that are not there.

- Rents will climb faster in the shock scenarios than in the base case, but not as strongly as one might expect given the way demand pulls back in response to the reduction in supply and decrease in vacancy rates.

- An unexpected shock to lending rates will in turn reduce the demand for loans and reduce mortgage debt outstanding.

In response to a shock from the removal of Federal support of the GSEs in their multi-housing roles, the initial mortgage shocks for the middle scenario (75 bps shock to lending rates) will reduce outstanding mortgage debt over a period of about two years before the market begins climbing back quickly to previous trends. The effect on rents and vacancies is not as intuitive as one might think. Given the current tightness in the market and the pullback in demand seen in response to the tightness in the market, households are clearly challenged by the current increases in market rent. In the worst case scenario, (100 bps shock to lending rates) and $30 billion reduction in liquidity, we would expect that just under one-year's worth of new starts would be taken away from our forecast of new supply in that time frame. The impact on rent growth is muted though given the way demand pulls back in response to the reductions in supply.

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Moody's Analytics' full report on potential multifamily mortgage market impacts of operating the Freddie Mac Multifamily business absent a government guarantee follows.

DECEMBER 12, 2012

The Multifamily Mortgage Market Without the GSEs

prepared for

Freddie Mac

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Executive Summary

The nation's housing market has gone from boom to bubble to bust over the past decade, with a devastating impact on the global economy and financial system. The causes of this calamity are the subject of significant debate, but there is no debate that in response the federal government has taken on an outsize role in supporting the housing market. While there is widespread agreement that this is not sustainable, the role government plays in the future remains an open question. This clearly applies to the single-family housing market but also to the multifamily market, which is supported by government guarantees on multifamily mortgage lending provided by Fannie Mae and Freddie Mac. This study considers what would happen to the multifamily market, and the housing market and economy more broadly, if the government-sponsored enterprises no longer provided this government backstop.

The federal government has played a significant role in the single-family housing market since the Great Depression in the 1930s. The Federal Housing Administration, Federal Home Bank System, and Fannie Mae were established in this extraordinarily difficult period to prevent wild swings in the housing market by ensuring a steady flow of mortgage credit. Freddie Mac was born in the early 1970s to provide a similar function. Over time, these institutions were charged with promoting single-family homeownership and ensuring that affordable rental housing was available to households without the financial means to own a home.

The system worked admirably for more than 60 years. The housing market suffered ups and downs, and foreclosures increased at times, but the problems were modest and manageable. The U.S. homeownership rate rose steadily from about 45% after the Depression to 65% by the mid-1990s. Fannie and Freddie also significantly expanded their financial support to the multifamily market during the 1990s. By the early 2000s, nearly one-third of total multifamily mortgage debt outstanding was guaranteed by the GSEs (see Chart 1).

Chart 1: GSEs' Role in Multifamily Market

Multifamily mortgage debt outstanding, $ bil
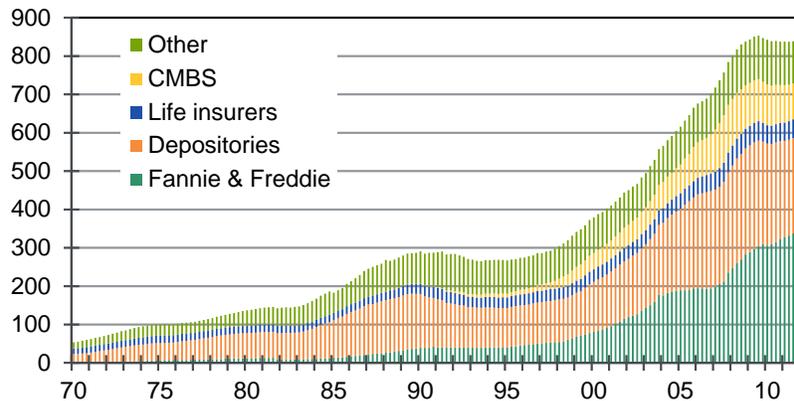
Sources: Federal Reserve Flow of Funds, Moody's Analytics

During the 2000s, however, the residential mortgage finance system changed dramatically because of the explosive growth of private-label mortgage securitization. Securitization was not new: The FHA and GSEs had been securitizing mortgages for more than 25 years. But as the new century began, private securitization surged in both size and scope, incorporating a wider range of mortgages. The commercial mortgage-backed securities market, including securities backed by multifamily loans, also expanded rapidly.

Securitization grew so complex and opaque that even the most sophisticated investors had trouble evaluating deals. Moreover, no participant in private-label securitizations had the responsibility of ensuring that the process worked. Mortgage banks and brokers originated loans but quickly sold them to investment banks, which packaged the loans into securities. Credit rating agencies assessed them, often using faulty information provided by the investment banks. Investors who purchased the securities took the ratings largely on faith. And government regulators provided little oversight, feeling the private market could regulate itself. Yet as the events of the past several years show, it clearly could not. Today, the private-label residential securities market is comatose and the CMBS market is a shadow of its former self.

The fault lines in the securitization process were stressed by the flood of capital that poured into the U.S. from China and other emerging economies. With trillions of dollars in reserves earned in trade with the U.S., investors in these economies found U.S. mortgage securities particularly alluring. They offered good returns, particularly given their brief historical credit performance. The easy monetary policies of central banks such as the Federal Reserve only added to the flood of global capital, which stretched the faulty securitization pipeline to the breaking point as it rushed through.

U.S. policymakers' aggressive pursuit of homeownership also contributed to the problem. Since the 1930s, single-family housing has received more government help than any other sector of the economy. Subsidies are provided via the mortgage interest and property tax deductions, favorable capital gains treatment, and the lower mortgage rates and affordable housing mandates of Fannie Mae and Freddie Mac, among other channels. The Clinton and Bush administrations often pointed to the rising homeownership rate as evidence of their economic policies' success. With both parties set on this policy objective, many households that should not have received mortgage loans got them.

Once the system began to break, the process was exacerbated by the collapse of Fannie Mae and Freddie Mac. While these institutions had been small contributors to the housing bubble, they were too thinly capitalized for the risks they were taking and were thus overwhelmed by the housing downturn and subsequent rise in mortgage defaults. Yet Fannie and Freddie were much too big to fail; because of their size and importance to the global financial system, both were put into conservatorship in September 2008. A string of massive financial failures followed, which led to the near collapse of the financial system.

The government's takeover of Fannie and Freddie effectively nationalized the mortgage finance system. Today, the two institutions, along with the FHA and VA, account for 90% of all new single-family mortgage loans. Fannie and Freddie also back more than 40% of all multifamily mortgage debt currently being originated.

No one is comfortable with this, and a debate on the future of the mortgage finance system has begun. There is general agreement that for the system to succeed, it must make reasonably priced mortgages available to qualified borrowers while limiting both risks and costs to taxpayers. The system should be resistant to the business cycle so mortgage credit remains ample during periods of market stress and is not excessive during periods of market hubris.

Maintaining the federal government's current domination of the mortgage finance system is one approach. Fannie and Freddie could be put into receivership and their activities subsumed into the federal government. Permanently nationalizing the system in this way would ensure that mortgage lending is not disrupted in bad times, but the cost to taxpayers could be enormous if the system is not well-managed. There are also reasonable concerns that government would provide overly generous subsidies to housing and stifle innovation, preventing the development of mortgage products that could more efficiently meet borrowers' needs.

At the other end of the spectrum is complete privatization of the mortgage finance system. The federal government would still regulate, but Fannie and Freddie would be downsized and their activities restricted. Some form of private-label securitization would have to be revived. Yet given recent history, it is unclear how well a purely private system would do during periods of financial market stress. It is also unclear whether the too-big-to-fail risk would be significantly mitigated; if the system were to fail again, the federal government would have to step in, at a significant cost to taxpayers.

There are many potential implications of privatization for both the single- and multifamily housing markets. For example, a private system would likely mean the end of the 30-year fixed-rate mortgage as a mainstay of U.S. housing finance. A privatized U.S. market would come to resemble overseas markets, primarily offering adjustable-rate mortgages. Based on the experience overseas, the fixed-rate share in the U.S. would decline to an average of between 10% and 20% of the mortgage market,

compared with a historical average of closer to 75%. Reinforcing this likelihood are the limits placed on the use of prepayment penalties in the recently passed Dodd-Frank financial regulatory reform legislation. Adjustable-rate mortgages are not inherently bad loan products, but they do shift the risk of fluctuating interest rates to homeowners. This would be a very significant adjustment for many U.S. homeowners who are not well-equipped to handle such risk.

Privatization would also meaningfully raise the cost and reduce the availability of multifamily mortgage credit. Private providers of mortgages—including depository institutions, life insurance companies, pension funds, and conduits—would require a higher return to fill the credit void left by the exiting GSEs. Not only do private providers not have sufficient capital or the requisite risk appetite to make mortgage loans on the same terms as the GSEs, the GSEs also ensure that the multifamily mortgage market remains liquid in tough economic times. Under reasonable assumptions and a well-functioning economy, without the GSEs, multifamily mortgage rates would rise between 75 and 150 basis points. This would meaningfully reduce the supply of rental housing and ultimately require households to pay more in rent.

Of more concern is what would happen if financial markets and the economy again suffered an event similar to the Great Recession. Without government support, multifamily housing construction would come to a virtual standstill. Borrowing costs would surge and credit availability would collapse so that construction activity would all but stop. Not only would this have a serious impact on the availability and cost of rental housing, but the hit to multifamily activity would be so significant it would also have a large impact on the broader economy.

Given how undesirable these prospects, it is desirable for the multifamily market to have some type of government backstop. Such a hybrid system could take many forms, but the most attractive would retain several roles for the federal government—insuring the system against catastrophe, standardizing the securitization process, regulating the system, and providing whatever subsidies are deemed appropriate by policymakers to disadvantaged households. Private markets would provide the bulk of the capital underpinning the system and originate and own the underlying mortgages and securities.

Regardless of how the mortgage finance system is changed, households will likely have to pay more for their housing in the future than they did prior to the financial crisis. Given the nation's fiscal challenges, the federal government cannot afford to continue providing such large subsidies. It is unclear that these subsidies were effective in any event, given the current foreclosure crisis. Nonetheless, it is critical that the mortgage finance system be better designed, or housing costs will be prohibitive and the costs to taxpayers in the next financial crisis overwhelming.

Government's Historical Role in the Housing Market

The housing market collapse has been devastating. Between the peak of the bubble in early 2006 and the bottom of the crash in late 2011, house prices fell by more than 30%, wiping out $7 trillion in housing equity. At the worst point, more than 15 million homeowners were under water (see Chart 2). More than 7 million households have lost homes through distress sales—foreclosure and short sales—resulting in almost $1 trillion in mortgage losses. The global financial system was brought to its knees as major financial institutions buckled under the weight of these losses.

Chart 2: Home Equity Dives, Negative Equity Soars
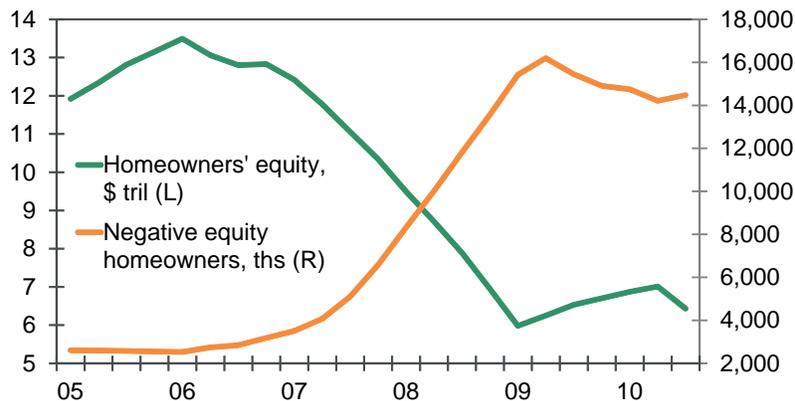
Sources: Federal Reserve, Moody's Analytics

The resulting credit crunch ignited the Great Recession—the longest and most severe economic downturn since the 1930s. A recovery has since taken hold, but growth has been unable to sufficiently reduce the unemployment rate, which remains stuck near 8% despite almost $1.8 trillion in fiscal stimulus and other financial support from the federal government.[i] The federal debt-to-GDP ratio is as high as it has been since the nation had to pay for World War II, and it is rising.

Depression baby

This was not the way it was supposed to be. After the Great Depression, the federal government established a number of institutions, including the FHA, the Federal Home Loan Banks, and Fannie Mae, to forestall wild swings in the housing market and promote homeownership. The system worked reasonably well for more than 60 years. The housing market suffered ups and downs, but its problems were modest and manageable. As a consequence, the homeownership rate rose steadily from about 45% after the Depression to 65% by the mid-1990s (see Chart 3).

Chart 3: Homeownership Surges Post-Depression

Homeownership rate, %
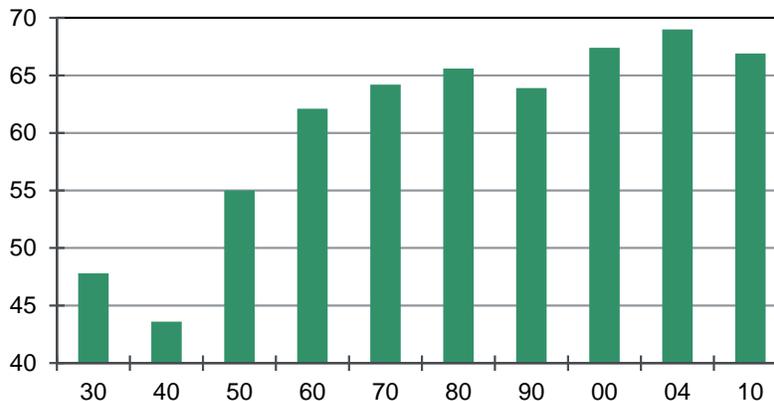
Sources: Census Bureau, Moody's Analytics

The key innovation of the Depression-era institutions was the 30-year, fixed-rate, self-amortizing mortgage. Before this, short-term balloon mortgages were common; after a few years, borrowers would either pay off their outstanding balances or, more typically, refinance their loans. As long as liquidity was flowing and banks were willing to roll over loans, the system worked well enough. But in bad times, liquidity quickly disappeared, and borrowers with expiring mortgages found themselves in foreclosure, as millions did during the Depression. The FHA introduced the 30-year fixed-rate mortgage to shelter homeowners from the business cycle and provide a fixed payment schedule in order to attract Depression-scarred households back to the housing market.

Fannie Mae and the Federal Home Loan Bank System were established to ensure mortgage lenders had adequate capital and liquidity during both good and bad times. Fannie Mae purchases mortgages from banks and other lending institutions, while the Federal Home Loan Bank System offers cheap loans to banks collateralized by the mortgages they originate. All of this was important because 30-year fixed-rate mortgages exposed lending institutions to interest rate and prepayment risks much more than short-term balloon payment mortgages had.

The FHA, Fannie Mae and FHLBs performed their functions well during the decades that followed their creation. Underwriting standards were high and loan losses were low because banks looking to sell loans to the government were required to attest that they had met certain standards. Under this "rep and warrant" model, any defaulting loans found not to have met these conditions had to be repurchased by lenders at cost, giving lenders a strong incentive to follow the rules.

Fannie Mae's success was reflected in its quickly expanding balance sheet, which by the 1960s had become a sizable part of the federal government's own assets and liabilities. For a government looking to finance both the Vietnam War and Great Society programs at home, Fannie's debt was a heavy burden, even if its underlying assets were solid. As a result, Fannie was spun out to private shareholders as a so-called government-sponsored enterprise at the end of the decade.[ii]

The federal government still maintained significant control over the mortgage finance system. Fannie had presidentially appointed board members and a line of credit with the U.S. Treasury. There were no explicit guarantees, but Fannie's creditors assumed the government would come to the company's aid if necessary. A second GSE, Freddie Mac, was established to provide more support to the housing market and supply competition for Fannie.[iii]

At the same time, policymakers also created Ginnie Mae and launched the residential mortgage-backed securities market. Ginnie Mae guarantees timely payment of principal and interest on RMBS backed by federally insured or guaranteed loans, mainly from the FHA and VA.[iv] Ginnie does not buy or sell mortgage loans or issue mortgage-backed securities, but securitization would likely not have spread without its guarantees.

The mortgage finance system worked admirably for 30 years after Fannie and Freddie became GSEs. The system was severely tested during the recessions of the early 1980s, the savings and loan crisis of the late 1980s and early 1990s, and the Asian financial crisis of the late 1990s, but it did not break. Without the government and government-backed institutions that formed its backbone, the system would not have weathered these storms nearly as well.

Securitization fails

The seeds of the mortgage finance system's failure were sown in the late 1990s, when private mortgage lenders and investment banks began to aggressively expand. The private-label RMBS market surged between the late 1990s and the mid-2000s. Fewer than 1 million first-mortgage loans backed such securities in early 1997, amounting to $130 billion in outstanding mortgage debt. A decade later, there were nearly 12 million loans, equal to $2.2 trillion in outstanding mortgage debt (see Chart 4). It is no coincidence that as the market experienced exponential growth, the housing bubble was inflating rapidly.

Chart 4: Private-Label RMBS Soars During Bubble

First mortgages in private-label securitized pools, mil
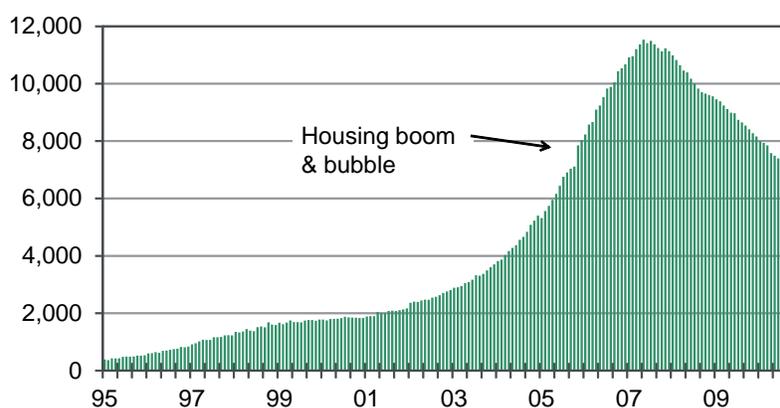
Sources: Moody's Investors Service, Moody's Analytics

The loans backing securities in the private-label RMBS market grew increasingly risky. At the market's apex in early 2007, almost 40% of such loans went to subprime borrowers with low credit scores and carried elevated loan-to-value ratios. So-called alternative-A loans, made to homeowners whose credit files contained some irregularity, accounted for another 27% of the market.[v] Option-ARM loans, which allowed homeowners to make reduced principal and interest payments and thus increase their debt over time, accounted for 13% of the market. All of these novel loan arrangements increased the lenders' risk; adding to it further was the practice of issuing "stated-income" loans, for which borrowers were not required to document their incomes with W-2 statements or tax returns. At the peak in activity in 2007, almost half of all mortgages were stated-income loans.

The explosion in private mortgage lending and securities issuance significantly diminished the role of the GSEs and FHA. Their share of total mortgage debt outstanding, which was consistently above 50% during the late 1990s and early 2000s, fell to 40% during the housing bubble (see Chart 5). The FHA and GSEs lost business to private-label RMBS, whose market share rose above 20%.[vi] In particular, FHA lending all but dried up.

Chart 5: Trading Places

Share of mortgage debt, %
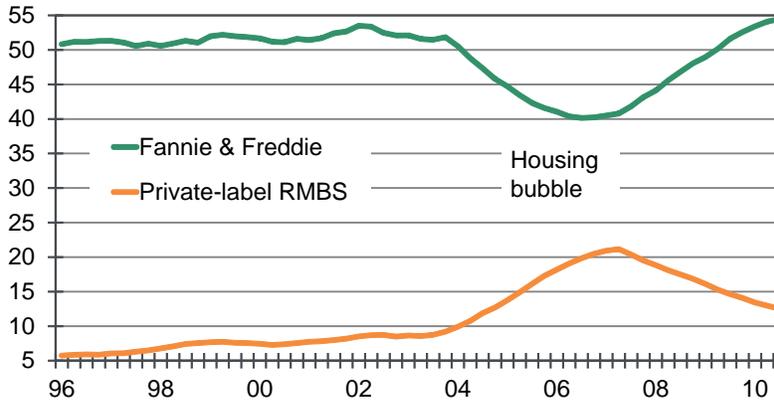
Sources: Federal Reserve Board Flow of Funds, Moody's Analytics

Global liquidity

The explosive growth of private-label RMBS was fueled by a flood of global capital. An explosion of low-cost Chinese production and a strong U.S. dollar caused the trade deficit to swell as hundreds of billions of dollars flowed overseas each year in exchange for imported goods. Surging prices for oil and other commodities, driven in part by booming Chinese demand, added to the import bill. As a result, investors in places from China and India to Russia and Brazil collected huge pools of dollars.

For these newly flush global investors, Wall Street's innovative financial securities seemed perfect investments. Global investors were led to believe they could take precisely calibrated risks using the new instruments within a U.S. bond market that was huge, liquid and historically safe. Overseas cash soon showered U.S. credit markets, pushing interest rates lower.

It did not take long for some of these global investors to become especially enamored with private-label RMBS. Foreigners had historically bought risk-free U.S. Treasuries; bonds issued and insured by government-tied institutions such as Fannie Mae and Freddie Mac were only a small step removed. From there, it was not much of a leap to invest in mortgage securities tied to Wall Street instead of the U.S. government.

Not responsible

But the private-label RMBS market was not up to the task of investing global investor dollars wisely. Trillions of dollars in bad mortgage loans were made because none of the system's participants was responsible for ensuring that it worked. These included the mortgage banks that originated the loans, the investment banks that packaged the loans into securities, the rating agencies that graded the creditworthiness of the securities, the global investors who purchased the securities, and the government regulators who oversaw various pieces of the system.

Securitization changed mortgage banks' long-standing "originate-to-hold" model of lending, in which they kept the loans they made on their own balance sheets. In its place was a new "originate-to-distribute" model, in which loans were sold to investment banks. That left the mortgage banks less exposed to risk and thus less motivated to lend carefully in the first place. This change in the banking business model was tacitly endorsed by regulators, who saw the transfer of risk as a way to diminish the chance of another savings and loan-type crisis. But, of course, the risk in these loans did not disappear; it simply shifted to investors and by extension to the broader financial system.

Investment banks themselves did not retain the risk long, as they bundled loans from various mortgage lenders into securities. As a result, the investment banks would not be on the hook if things went wrong. Yet their incentives for ensuring the securities were sound also grew fuzzy as the investment banks acquired their own mortgage banking operations and even became investors in their own securities to keep the deals and fees flowing.[vii]

Without a rating from the credit rating agencies, the investment bankers who issued the RMBS could not have sold them to investors. The agencies' opinions held particular weight when it came to pricing RMBS, as few global investors were equipped or inclined to evaluate these extraordinarily complex debt instruments on their own. Unfortunately, the agencies issued tens of thousands of ratings on RMBS that were subsequently downgraded.

The rating agencies' opinions were in many cases based on bad data. The agencies assumed information from bond issuers to be correct, so when the issuers provided data on such things as homebuyers' debt-to-income ratios, property prices, and so on, the agencies took them at face value. This was widely understood; the agencies did not consider it their responsibility to verify such data, so they could not tell when homebuyers were stretching the truth or simply lying. With so many loan documents containing "stated" incomes and lax appraisals, ratings on trillions of dollars of RMBS were based on faulty, if not falsified, data.

The agencies also relied too heavily on historical performance trends rather than the full range of possible economic outcomes— including a Great Depression-style scenario. The long history of house price gains since the Depression, at least in nominal terms averaged nationwide, led to the strong conclusion that prices, in aggregate, would never decline (see Chart 6). Prices in one or two regions might fall, as in Houston in the 1980s or Los Angeles in the early 1990s, but a broader downturn was unthinkable. The maxim that "all real estate is local," a once strongly held tenet of the mortgage business, was ingrained in the assumptions of rating agencies and other securitization market participants.

Chart 6: Consistent Price Gains Since Depression

House price growth, %
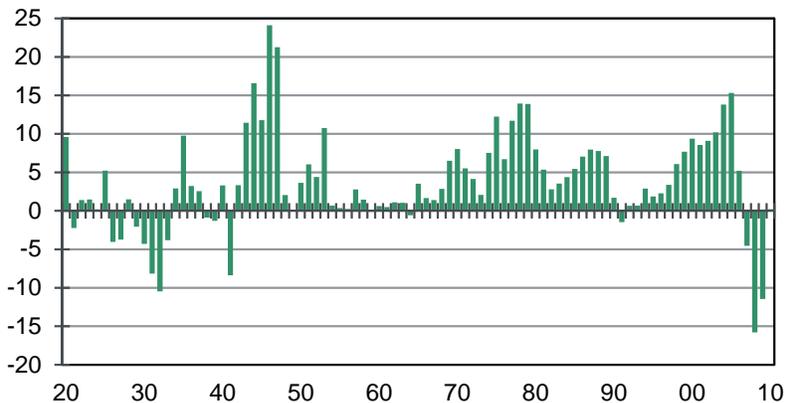
Sources: Robert Shiller, Fiserv, Moody's Analytics

Global investors grew increasingly complacent about RMBS. For other asset classes, institutional investors had well-established in-house analytical capabilities to augment the credit ratings issued by the agencies. But for RMBS, they accepted the agencies' opinions as fact. Times were great, the global economy was strong, and asset prices were rising quickly almost everywhere. Skeptics argued for a time that markets were becoming overpriced, and for a time, the skeptics were heeded. The financial pain of the tech-stock bust and the Asian financial crisis had not been forgotten, and most of the signals used to value investments were flashing red. However, as asset prices marched higher, those who argued that something was askew in global asset markets lost credibility. Eventually, their views either changed or were dismissed as simplistic and impractical.

Seeking to make sense of their own investment decisions, asset managers devised their own intellectual defense of lofty global asset prices. This time it was different, the argument went. Never before had the global economy been this stable or this open. In this great moderation, business cycles would be milder and briefer than in the past. Ups and downs in employment and income, corporate profits, and landlords' rents—conditions that determined the value of mortgage-backed bonds—were less volatile. Investors were encouraged to believe a more stable global economy meant more stable returns. Feeling secure, they sought to magnify their returns through leverage, borrowing to buy even more of whatever they were investing in. Leverage can generate extraordinary returns if an investment works out but can be financially devastating if it does not.

Government regulation of the housing and mortgage markets proved ineffective during the boom. This was, in part, simply because of the mishmash of regulators overseeing different aspects of the market. Their sheer numbers muddied the response to the frenzy leading up to the financial crisis. Some regulators recognized that increasingly easy lending standards would soon be a problem; a few publicly warned of the risks. But with so many diverse groups involved, it was difficult to get a working quorum for decision-making. At a time when more diligent oversight was desperately needed, half of the nation's lenders were regulated at the federal level and half by the states.

The 1980s and 1990s were also marked by a steady march toward deregulation. The trend climaxed in 1999 with congressional passage of the Gramm-Leach-Bliley bill, which overturned Depression-era banking laws separating commercial banking from securities dealing and insurance. The Basel II rules on banks' capital reserve requirements were being fashioned at about the same time. These rules rely heavily on market forces; how much capital banks need, and therefore how aggressive they can be in their lending, is determined mainly by the market value of their holdings.[viii] The fashion in banking circles was to let the market—not regulators—determine what was appropriate. But as the subsequent financial crisis has made clear, the private-label RMBS market did not responsibly self-regulate.

Homeownership goals

While securitization failed, the excesses in the housing and mortgage markets were also fueled by America's fierce, long-running devotion to the goal of homeownership for all. Since the Depression, policymakers had viewed the percentage of American families who owned their dwellings as a benchmark of economic success. Regulators were given a seemingly open-ended mandate to drive that number higher.

The policy pursuit of higher homeownership went into high gear beginning in the 1970s, as it also became a test of the nation's success in promoting civil rights. The 1977 Community Reinvestment Act had outlawed "redlining," banks' practice of withholding mortgage loans from certain disfavored neighborhoods, which typically were outlined in red on maps. Such neighborhoods were usually inhabited by the poor or out-of-favor ethnic or racial groups. The CRA was meant not just to end but to actively reverse the effects of such discrimination by encouraging banks to lend in underserved areas. The CRA was given more teeth during the 1990s: Regulators could now require banks to explicitly target disadvantaged neighborhoods for both business and home-mortgage lending.

At about this time, the Federal Reserve also unveiled new statistical methods for detecting discrimination in mortgage lending. Marrying data from mortgage loan applications and approvals (as required under the 1975 Home Mortgage Disclosure Act) with sophisticated econometric techniques, researchers at the Fed felt they could tell whether lenders were discriminating racially. A bank tagged by the Fed's models could be denied permission to acquire or merge with another bank. This was a period of active consolidation in the banking industry, and any institution that could not be a shark quickly became a minnow. Only a handful of banks actually failed the Fed's test, but they were soon acquired, reinforcing the regulators' message to push homeownership aggressively.

The Clinton administration was proud of the rise in homeownership during the 1990s, particularly among lower-income and minority households, who gained meaningful access to mortgage credit for the first time. African-American and Hispanic households with incomes and savings, who may have been unable to obtain mortgage loans in the past, could finally do so. While homeownership rose 7% among white households during the decade, it increased 13% among African-American households and 18% among Hispanic households. This was a priority for the Clinton administration; it empowered and then pushed regulators to aggressively enforce requirements on mortgage lenders to extend more loans to previously excluded groups.

President George W. Bush readily took up the homeownership baton at the start of his administration in 2001. A home became one pillar of his "ownership society," a vision in which every American would possess a financial stake in the economy. For millions, this meant owning their home. In the summer of 2002, Bush challenged lenders to add 5.5 million new minority homeowners by the end of the decade; in 2003, he signed the American Dream Downpayment Act, a program offering money to lower-income households to help with down payments and closing costs on a first home.

To reinforce this effort, the Bush administration put substantial pressure on Fannie Mae and Freddie Mac to increase funding of mortgage loans to lower-income groups. HUD gave them aggressive "affordable" housing goals (see Chart 7). Both Fannie and Freddie—whose activities had been severely circumscribed after they were found to have improperly managed their earnings through irregular accounting during the early 2000s—were willing to go along with policymakers' requests. This also fit with the GSEs' business objective to stem erosion in their market share to the private-label RMBS market. The GSEs thus lowered their underwriting standards, becoming sizable buyers of the Aaa tranches of subprime and alt-A mortgage securities, at the very worst time, just before the start of the financial crisis in 2007.[ix]

Chart 7: Fannie and Freddie's Housing Goals

% of new acquisitions by yr
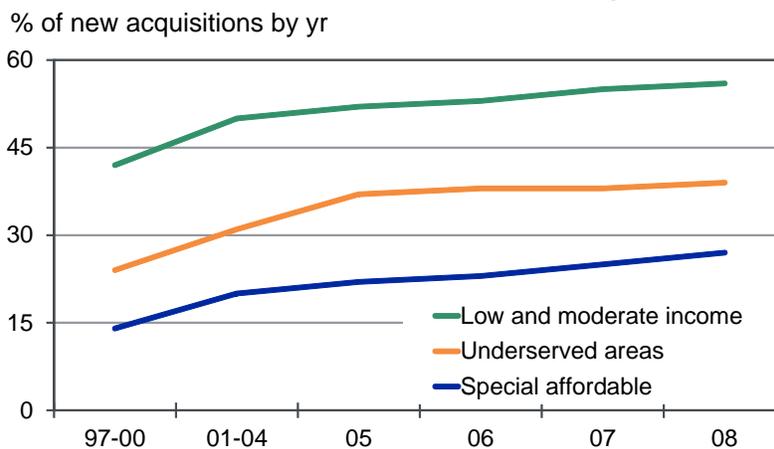
Sources: HUD, Moody's Analytics

The federal government's aggressive pursuit of homeownership was a significant contributing cause of the financial crisis. It was up to policymakers and regulators to strike the appropriate balance between promoting homeownership and ensuring prudent mortgage lending. They failed to strike that balance.

Government backstop

The housing market peaked in the spring of 2006, and cracks in the mortgage finance system were developing by the spring of 2007.[x] By the spring of 2008, house prices were falling quickly and mortgage delinquencies and foreclosures were rising rapidly. Bear Stearns failed under the weight of its exposure to the housing and mortgage markets, and it was evident that Fannie and Freddie's gambit to regain market share from the private-label RMBS market had been a serious mistake. Federal regulators put the GSEs into conservatorship in early September 2008, effectively wiping out shareholders.[xi]

The missteps and failure of the GSEs did not cause the housing market and mortgage finance system to collapse, but they set off a chain of events resulting in the most severe financial crisis and economic downturn since the Great Depression. Fannie and Freddie's takeover persuaded global investors that none of their investments was safe, and just as during the Great Depression, a panic ensued. Lehman Brothers, the next weakest link in the financial system, filed for bankruptcy a week after the government takeover of the GSEs, and a series of blue-chip financial institutions failed soon thereafter.

The GSEs had come full circle, once again becoming part of the federal government. Along with the FHA, they quickly filled the void left by the vanishing private-label RMBS market. The GSEs' share of mortgage originations surged to almost 95% in 2010, and their share of mortgage debt outstanding is quickly closing in on a record 55% (see Chart 8). There currently is no private-label RMBS-related origination activity to speak of, and the private share of mortgage debt outstanding is falling rapidly toward 12%.

Chart 8: Government Lending Filled the Void

% of total mortgage originations
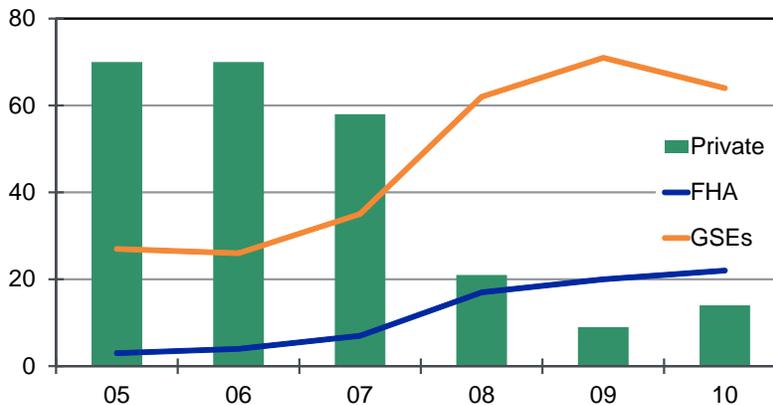
Sources: FHA, GSEs, Moody's Analytics

The federal government's ability to quickly intervene in the nation's mortgage finance system saved the housing market and economy from an even more catastrophic fate.[xii] While a severe credit crunch took hold across nearly all lending and credit markets, residential mortgage credit continued to flow. Credit was not nearly as ample as it had been—which, given the egregious underwriting of the housing boom, was a desirable outcome—but the availability and cost of mortgage credit was not a major impediment to homebuying. This government backstop is one of the most important reasons why the economy suffered a Great Recession, and not another Great Depression.

Aggressive government intervention succeeded in backstopping the housing market during the financial crisis, but the costs were high. Taxpayers will ultimately spend nearly $200 billion to shore up Fannie and Freddie, fund mortgage modification and refinancing efforts, finance three rounds of homebuyers' tax credits, and cover the Federal Reserve's likely losses on the mortgage securities it purchased during its period of credit easing (see Table 1).[xiii]

Table 1: Residential Mortgage Loan Realized Losses
$ bil

	2006	2007	2008	2009	2010	2011	2006-2011	Share of Losses
Total	17.3	45.4	181.8	305	198.8	167.4	915.7	100
Government Backed	7.4	13.9	55	113.8	57.9	53.1	301.2	32.9
Fannie Mae & Freddie Mac	1.1	8.1	47.3	103.4	43.8	38.2	241.9	26.4
Fannie Mae	0.8	5	29.8	73.5	26.6	27.5	163.3	17.8
Freddie Mac	0.3	3.1	17.5	29.8	17.2	10.7	78.6	8.6
Federal Housing Administration	6.3	5.9	7.6	10.5	14.1	14.9	59.3	6.5
Privately Backed	9.9	31.5	126.8	191.1	140.9	114.3	614.5	67.1
Depository Institutions	2.7	7.3	35	54.9	48.2	35.3	183.4	20
Private-Label Mortgage Securities	7.2	24.2	91.8	136.2	92.7	79	431.1	47.1
Subprime	5.6	15.4	55.9	71.5	38.9	34.7	222.1	24.3
Alt-A	0.2	0.9	10.8	27.5	23.8	20.3	83.4	9.1
Option ARMs	0	0.2	5.1	17.8	17.4	14.5	55	6
HELOC	0.2	1.5	5.1	5.1	3.4	2.1	17.4	1.9
Jumbo	0	0	0.3	1.9	3.1	3.7	9.1	1

Note: Total of private-label mortgage securities includes securities not in components shown in the table.
Sources: Fannie Mae, Freddie Mac, HUD, FDIC, Federal Reserve Board, Moody's Analytics

Meanwhile, the financial crisis has left the mortgage finance system in tatters. Fannie and Freddie are operating in conservatorship, an unsustainable form of financial and regulatory limbo. The FHA makes almost one-third of all home-purchase mortgage loans and is thus taking on more credit risk than policymakers ever envisaged. The Federal Reserve has close to $1.2 trillion in Fannie and Freddie debt and mortgage securities on its balance sheet, and this is set to increase substantially more given the Fed's recently announced open-ended quantitative easing program. Very little private lending is taking place, save for large jumbo mortgage loans to borrowers with high credit scores and ample home equity. Private lenders will likely remain reluctant to provide more credit until the government's future role in the mortgage market is clear.

This is untenable; thus, planning for a new mortgage finance system is under way. Given the fragility of the housing and mortgage markets and the complexity of the system, any change will take years, if not decades, to be fully implemented.

# Current Conditions in the Multifamily Housing Market

The housing crash and resulting Great Recession have arguably left an indelible mark on household perceptions regarding the benefits of homeownership and a rethinking of the benefits of renting. Rental demand has soared, and despite stronger new construction, rental vacancy rates are declining and rents are posting solid gains. This section of the study discusses the current state of the multifamily rental housing market, evaluating the demand for rental housing, supply conditions, and financing. The Moody's Analytics outlook for the multifamily housing market is also presented.

The Great Recession hit rental markets hard, but they have rebounded strongly in the subsequent lackluster economic recovery. Although the hit to incomes, jobs and household growth that occurred as a result of the recession hurt rental demand, the recession also caused households to shift from homeownership to renting. Coming out of the recession, the increase in demand for homes benefits both the for-sale and rental markets, but the characteristics of the new households benefit the rental market in particular. Long spells of unemployment suggest that once employed, these households may have the resources to rent, but are unlikely to have the resources to purchase a home.

In addition to the favorable economic backdrop to renting, demographics are also favoring renting. An eight-year rise in both the number of renter households and the rate at which households are renting homes reflects the gain. According to the Census Bureau's quarterly Housing Vacancy Survey, the number of households who rent has risen steadily since 2006, even as the number of homeowners declined by nearly 1 million, its largest and longest decline in the 47 years that Census has conducted this survey (see Chart 9). The renter rate has also increased since 2006, with 34.4% of the nation's households renting as of the second quarter of 2012, a share that is well above the 31% low hit near the peak of the housing boom almost a decade ago.

Chart 9: Fewer Owners, More Renters
Occupied housing stock, mil
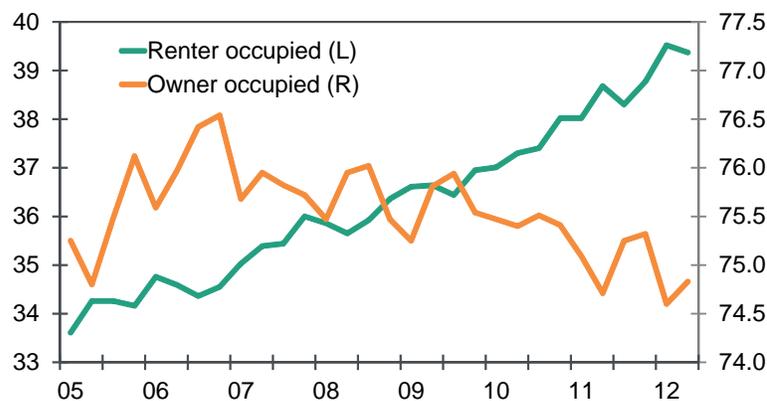
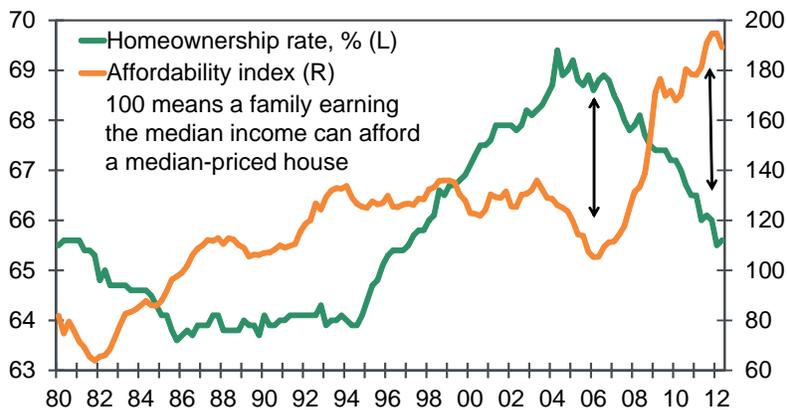Sources: Census Bureau, Moody's Analytics

Households have two key economic considerations when choosing between renting and buying a home. First, housing can be considered a consumption good that is necessary for shelter. As a consumption good, a household's needs, preferences, and ability to pay drive demand for owning a home. Second, an owned house is an investment good that contributes to wealth. As an investment, households will examine the net return on owning a home against the return on other types of investment goods. If households have a strong preference for investment in housing, they are more likely to purchase a home than to rent. In theory, owners can invest in more housing than they need and rent out the excess. If households have a stronger preference for consumption of housing, renting would be a better option.[xiv] Another important factor in the calculation is the cost of renting. Low rents relative to house prices will encourage households to rent. Thus the drivers of consumption and investment demand for owning a home, largely economic and demographic factors, will also drive households' tenure choice.

The decision to rent is closely tied to economic conditions, affecting both the consumption and investment drivers. The ability to purchase a home depends on a household's employment status, income and wealth, factors that are all related to economic growth. Without a steady source of income, households will not be able to come up with a down payment to purchase a home, nor will they be able to service the mortgage loan. Indeed, the rental population skews to lower-income households. Nearly one-half of households earning less than the median family income rent their homes, while less than one-fifth of households earning the median income or more rent.

Nearly 1.7 million households dropped out of the ranks of homeowners between 2006 and 2009 given surging unemployment during the Great Recession, while renter households continued to climb. Coming out of the recession, job growth has been weak, adding back only half of the more than 8 million lost. Similarly, slow income growth has accompanied the tentative economic recovery. Real per capita income grew at an annualized rate of less than 1% in 2010 and 2011, compared with 2% growth between 2000 and 2008. Consequently, many households, particularly new households, lack the financial wherewithal to purchase a home and thus are more likely to rent than to buy.

Single-family housing affordability is also an important determinant of the tenure choice. Low mortgage interest rates and low house prices help to promote home sales to the detriment of rental demand. However, this relationship can be severely weakened by other forces. For example, renting gained considerable ground over the past several years even as single-family housing has become more affordable than ever (see Chart 10). During this period, high affordability could not counter the weak job growth and the exodus of many overleveraged homeowners out of homeownership. Further, homes may be affordable, but the availability of credit is another important driver of homeownership. Lax lending standards leading through the housing bubble in the midpart of the last decade contributed to the explosion in homeownership, and the now much tighter standards are making it difficult for households to get a mortgage loan to become a homeowner.

Chart 10: Affordability Does Not Always Help

Sources: NAR, Census Bureau, Moody's Analytics

Economic factors also drive the decision to purchase a house as an investment. Households compare the returns on investing in other assets such as equities or bonds to the return on owning a home. Thus, stock market performance and interest rates can have a bearing on home purchases. The returns on owning are determined by expected house price appreciation less the costs of owning a home. These costs include home insurance, maintenance costs, property taxes, and mortgage interest payments net of any tax benefits of owning a home.[xv] Assuming that expected house price appreciation is closely tied to recent price trends, both the return on owning a home relative to other financial investments and the user cost of housing became less supportive of homeownership to the benefit of rental demand. The Sharpe ratio, or the difference between returns on a typical basket of equity

and bonds held by households, and house price appreciation increased for much of the past several years, while the user cost of housing rose to a record high in 2009 as a result of the collapse in house prices (see Chart 11).

Chart 11: Owning Costs More and Returns Less

%

Legend:
- Returns on housing less returns on other asset classes
- User cost of housing
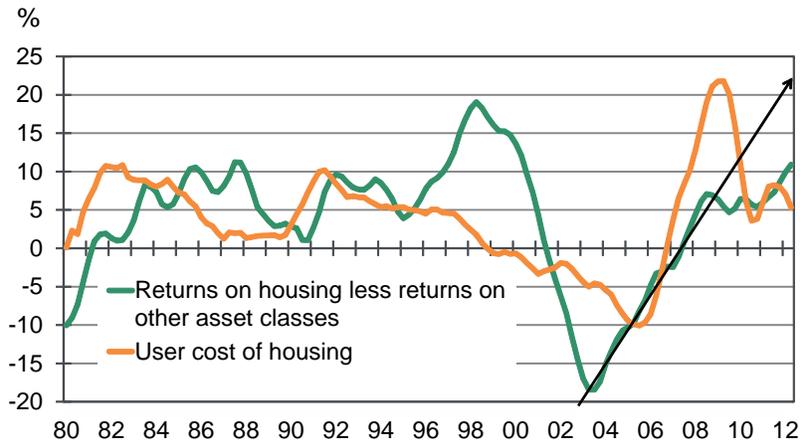
Source: Moody's Analytics

The cost of renting is also key to tenure choice; households will choose to rent if house prices are high relative to rents. Even with the large decline in house prices, the cost of renting continues to be low relative to buying a home, according to the house price-to-rent ratio (see Chart 12). The price-to-rent ratio is simply the ratio of the price of a median-priced home to the average annual rent for an average-sized apartment in the country's largest metro areas. When the current value meaningfully exceeds the long-term average, house prices are overvalued with respect to renting. This rule of thumb is useful to gauge how overpriced housing is with respect to renting relative to its historic norm. The gap has narrowed significantly due to both the plunge in house prices and the rise in rental rates, but the gap has benefited rental markets for much of the past six years.

Chart 12: Owning Overvalued Relative to Renting

Price-to-rent ratio

1990-2003 average
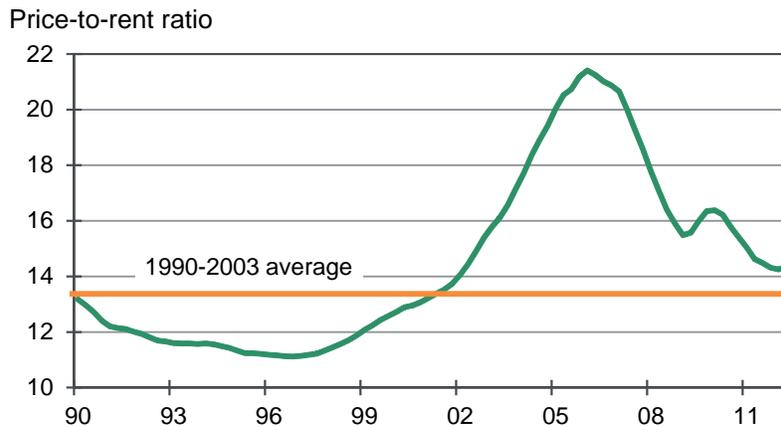
Sources: Fiserv, PPR, Moody's Analytics

Another support to rental demand is the fact that many homeowners have lost their homes over the past several years, which makes it difficult for them to return to homeownership: Lenders typically will not approve a mortgage if a borrower has been through foreclosure within the last seven years, although the FHA guarantees loans for borrowers three years after foreclosure. Moody's Analytics estimates nearly 5 million homes were lost to a distress sale between 2006 and last year. Some of these households may have doubled up with friends or family, but many others have turned into renters. It is important to note that many of these households are already accustomed to living in single-family homes and will thus be more likely to rent single-family homes. In some communities, almost one-fifth of new renters were once homeowners. This trend is reflected in the rise of the number of single-family rentals. According to the American Community Survey, the number of occupied single-family rental units increased by 22% between 2006 and 2011 compared with an increase of 7% for renter occupied multifamily units (see Chart 13).

Chart 13: SF Renter Households Grow Quickly
Occupied renter units, 2006=100
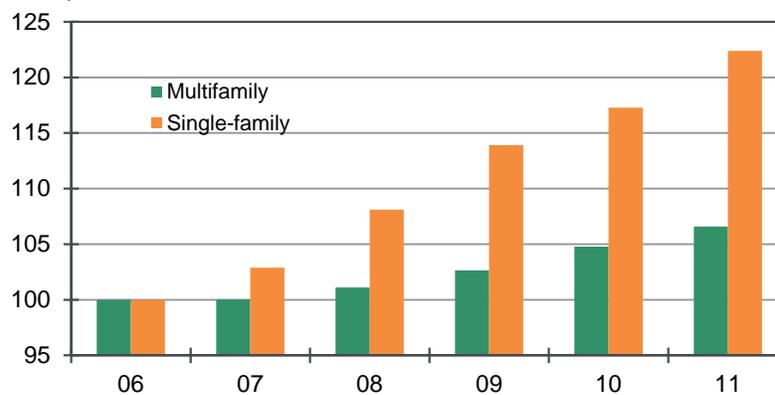
Sources: Census Bureau, Moody's Analytics

A final driver of homeownership is household perceptions. Owning a home has long been the American Dream, but the Great Recession may have permanently depressed this desire. In particular, many young adults who will be entering the high-homeownership age cohorts over the next 15 years spent much of their early adult years watching the housing market unravel and may think twice before buying a home. Academic studies of the issue allay some of these fears. Drew and Herbert, for example, examine Fannie Mae surveys on consumer perceptions of homebuying and find no evidence of a permanent shift in sentiment.[xvi] House price depreciation and foreclosure rates do not impact views toward homeownership. Instead, consistent with past behavior patterns, characteristics such as gender, age, ethnicity, income and current tenure have the most impact on tenure preferences. It is, however, difficult to measure consumer preferences, and it is likely that, at least temporarily, views on homeownership have soured.

Demographic factors also influence the decision to rent or buy. Over the past several years, these forces have augmented the support for renting that the recession and slow expansion have provided. Tenure choice is influenced by lifestyle considerations that are shaped by household characteristics such as household size, the presence of children, and anticipated length of stay. Many of these factors are in turn closely related to age. For example, younger households are more likely to be single and childless and thus less apt to buy a home. Households headed by younger people are also more likely to be renters because they lack the financial resources to purchase a house. There are a number of other harder to quantify reasons for renting that are likely also more important for younger households. Renting offers greater flexibility and fewer responsibilities than owning a home.

Younger households are also more likely to value mobility, which makes renting more attractive. These conditions reverse as households age into the next cohort, and the renter rate rises until the 75 and older group. Even for this group, which may find it

difficult to live independently, the renter rate is well below average. Thus, a key driver in the long run for renting is the age distribution of the population (see Chart 14). The renter rate for households headed by a 25- to 29-year-old is more than 65% in 2011, according to the Housing Vacancy Survey, while the renter rate for households headed by someone younger than 24 years old is 77%. By contrast, the overall rental rate is 34%.

Chart 14: Younger Households Likely to Rent

Renter rate by age cohort, 2011, % occupied households
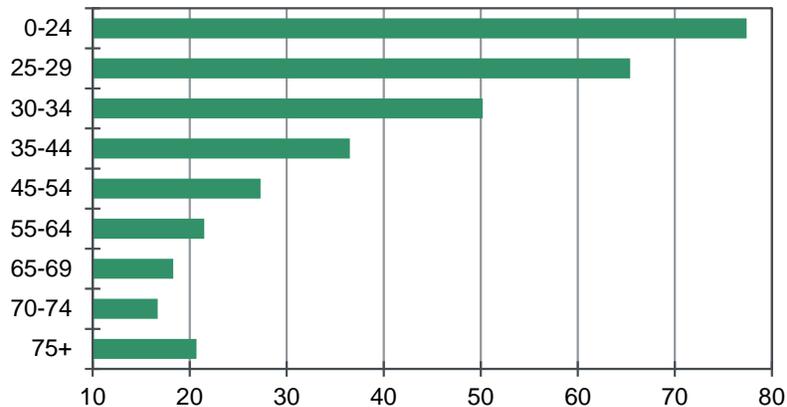
Sources: Census Bureau, Moody's Analytics

Demographics have thus been positive for renting, with growth in the number of young adult households getting a double boost. The coming of age of the echo boom generation has meant that the population aged 15 to 34, the age group with the highest renter rate, has been growing strongly. In particular the 25 to 34 age group, those who are most likely to form their own households, is rising for the first time since the 1980s (see Chart 15). Moreover, young adults who delayed moving out of or returned to their parents homes during the recession because of the lack of job opportunities will head many of the newly forming households. Employed 16- to 34-year-olds increased by 1.6 million between the end of 2009 and the end of last year, constituting the lion's share of the 2.2 million increase in employment, according to the household survey. These younger households will most likely rent apartments.

Chart 15: Young Adults Boost Renter Demand

Population aged 25-34, mil
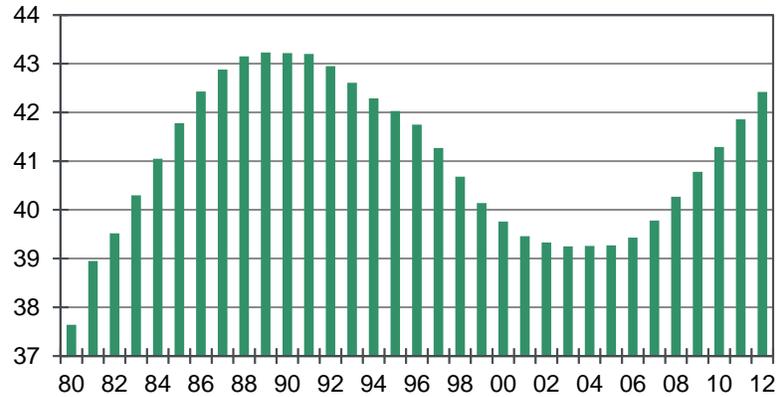
Sources: Census Bureau, Moody's Analytics

Age distribution is a key demographic driver of renting, but other factors also matter. Race, ethnicity, gender and marital status stand out as other differentiators of tenure choice. At the end of 2011, 55% of black households were renters, compared with only 26% of white non-Hispanic households. The Great Recession has resulted in a higher share of black renters, with an increase of 4 percentage points from late 2004, compared with 2 percentage points for white non-Hispanic households. Although age and marital status are correlated, the gap between the married-couple household renter rate, 18%, and unmarried households, 50%, is high. The gap is even larger for female-headed households who have a 52% renter rate.

Balanced rental supply

The supply of rental housing has increased in the past several years in response to the stronger demand.

Construction of homes that are most likely intended for renting never reached the fever pitch of single-family building during the housing boom. The rental market thus did not become overbuilt and has been able to easily support the modest pace of construction during the recovery. And while there has been shifting of single-family housing stock from owned units to renter units, the apartment market remains well-balanced.

Construction of multifamily housing units, the vast majority of which are rental units, has outpaced that of single-family units. According to the American Community Survey, 86% of occupied multifamily homes are rented, a share that has increased steadily since 2006. Since the economy started its expansion, the pace of multifamily housing starts has doubled compared with an increase of 20% for single-family construction that barely lifts it up from a record slow pace (see Chart 16). These broad trends are evident in groundbreaking of homes in larger apartment buildings: Starts of units in five-unit or larger buildings rose steadily from an average of only 67,000 at the end of 2009 to 207,000 in the second quarter. Ninety-five percent of multifamily starts are in buildings with five or more units.

Chart 16: Multifamily Building Recovers Faster…

Housing starts, 2009Q1=100
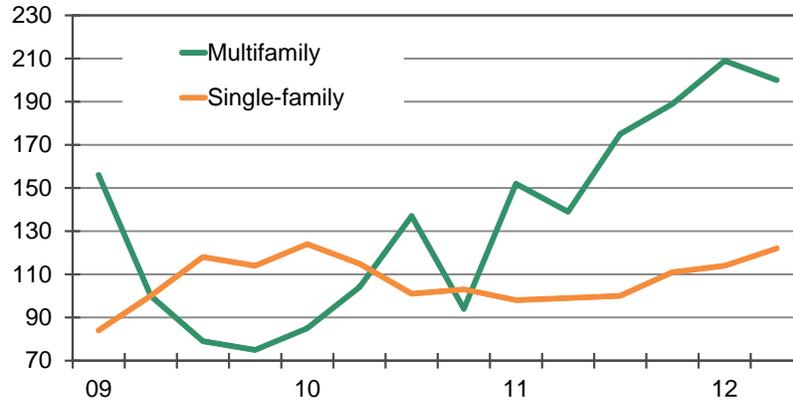
Sources: Census Bureau, Moody's Analytics

Acceleration in apartment construction exceeds that of single-family construction, but in the context of longer-term trends, apartment construction is still low and is not keeping up with household growth. At an annualized pace of 217,000 units in the second quarter of 2012, multifamily construction is still well short of its remarkably stable prerecession pace of 340,000 units, a pace that was maintained between 1996 and 2006. Relative to households, multifamily construction has fallen short of its normal pace, with current apartment completions per thousand households falling well below a two-decade average of 2.3 (see Chart 17).

Chart 17: …But Construction Is Below Normal

Completed units in 5+ unit buildings per ths households
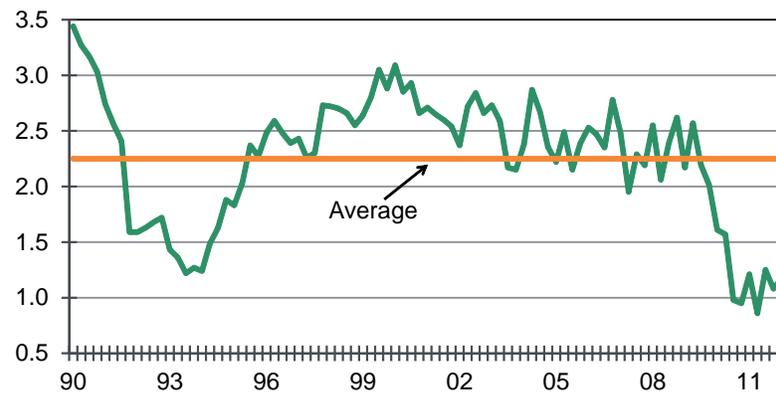
Sources: Census Bureau, Moody's Analytics

Despite the weak pace of homebuilding, the overall housing stock increased by 1.8% between the bottom of the recession in 2009 and 2011, according to the American Community Survey. Reflecting the relative strength in multifamily construction, the increase

was stronger at 2%. In particular, growth in large apartment buildings has been strong. Representing 33% of the multifamily housing stock, the number of homes in 20-unit or larger buildings gained by 7% to stand at 11.5 million units in 2011.

Two other trends influenced the renter stock during this cycle. To feed the strong demand for homeownership during the housing boom, construction of condominiums heated up, as well as conversions of apartments into condominiums. Data from the biennial American Housing Survey reflect these trends, with the share of units in 50-plus unit buildings that are intended for renting declining from 77% in 2001 to 73% in 2007. On the flip side, in the wake of the housing crash and recession, a plunge in the number of first-time homebuyers, combined with the exit of a number of households from homeownership, resulted in the conversion of single-family units to rentals. The share of single-family homes that are rental units declined steadily from 1985 to 2005, but then increased in 2007 and rose again in 2009 and 2011. Concurrently, by 2011, the share of rental units that are single-family homes increased to 54% (see Chart 18). Anecdotal evidence corroborates the Census Bureau data, indicating that investors are jumping into markets with ample discounted distressed home inventories and buying these homes to convert to rental properties.

Chart 18: Single-Family Rental Units Gain
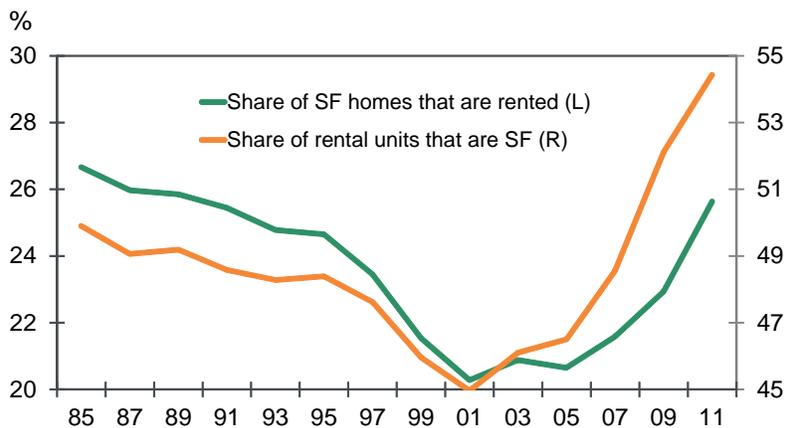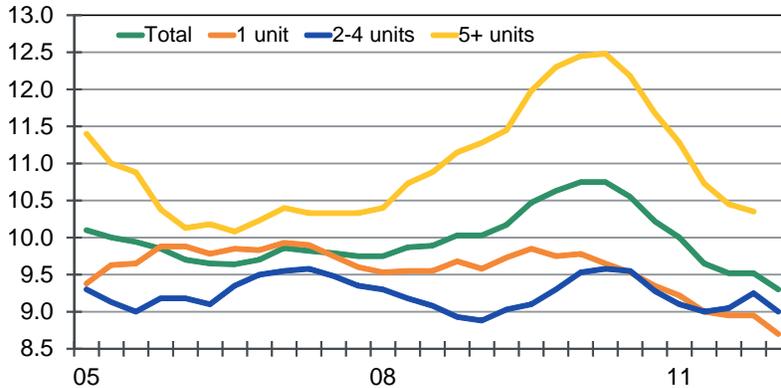

Sources: Census Bureau, Moody's Analytics

Despite the conversions of single-family homes to rental units, the proportion of total rental stock to total housing stock has stayed stable at about 30% since 2005. This stable rental share, combined with a greater demand for rental units during the economic recovery, has helped to drive down vacancy rates. The conversion of single-family homes to rentals has meant that apartment vacancy rates have improved more than single-family vacancy rates.

Falling vacancies, rising rents

Nearly three years into the economic recovery, rental markets are fairly well-balanced in the context of the past 20 years. Reflecting the tightening market, the rental vacancy rate is falling. Rental vacancy rates are down from a peak of near 11% in 2009 to 8.6% in the second quarter of 2012 (see Chart 19). The decline puts the rental vacancy rate slightly below the 20-year average. The segment of the rental market that has improved the most during this period is units in buildings with 10 or more apartments, where the rental vacancy rate dropped 330 basis points compared with the average decline of 200 basis points. Despite the stepped-up pace of single-family conversions to rental units, supply conditions in the single-family rental market are also tightening, as evidenced by the 115-basis point drop in the single-family rental vacancy rate over the same period.

Chart 19: Rental Vacancy Rates Decline

Rental vacancy rate, %, 4-qtr MA

Sources: Census Bureau, Moody's Analytics

Demand has been strong enough relative to the supply of rental units that rents are rising. Specifically, rents are rising for large investor-grade apartment buildings concurrent with the decline in rental vacancy rates. According to REIS, Inc., the effective apartment rent among the nation's largest metro areas increased by an average pace of 2.8% year over year since 2011 (see Chart 20). By contrast, rents declined by 2% in 2009 and were nearly flat in 2010. Similar to the trends painted by the Census data on apartment buildings with 10 or more units, the REIS rental vacancy rate has also declined more than 300 basis points since the 2009 peak. California metro areas are enjoying the strongest pace of rent growth. San Francisco posted gains of nearly 6% in the first quarter of 2012 and effective rents in San Jose grew by nearly 5%. Both markets benefit from strong tech growth and limited apartment construction. High incomes and young households that are associated with tech industry employment help to drive demand for class A apartments.

## Chart 20: Rents Rising for Investor Properties

Apartments
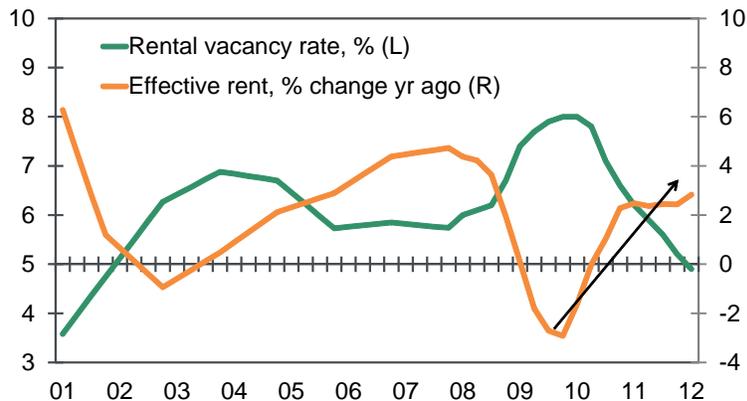
Sources: REIS Inc., Moody's Analytics

Rising rents are positive for investors in multifamily properties and help to lift the price of apartments. Although multifamily construction avoided the wild swings that hit the single-family market over the last decade, the swings in multifamily property values have been just as large, with apartment prices lagging single-family price trends slightly during the housing correction. Unlike the single-family house price, however, apartment prices as measured by the Moody's/RCA apartment price index have turned around sharply, posting year-over-year gains of as much as 20% since 2010 (see Chart 21). The apartment price index stands 14% below its prerecession peak. However, it has recovered more than the value lost during the recession. By contrast, the Case-Shiller national house price index has barely budged from the bottom and stands 31% below peak.

Chart 21: Apartment Price Cycle Was Severe
% change yr ago
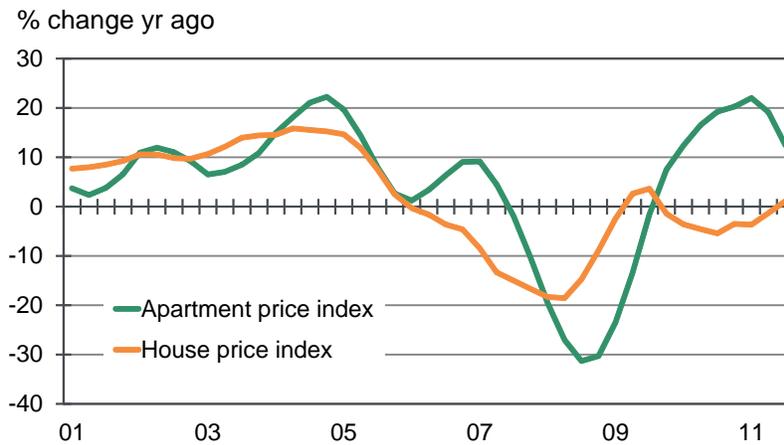
Sources: Fiserv, Real Capital Analytics, Moody's Analytics

Borrowing is also picking up. According to the Mortgage Bankers' Association, $109 billion in multifamily mortgages were originated in 2011. This marked the second consecutive year of gains in multifamily mortgage originations. The value of outstanding mortgages is rising again, albeit at a slow pace (see Chart 22). Greater caution among lenders is partially behind the low volume of originations, which remain 17% below that of 2005.
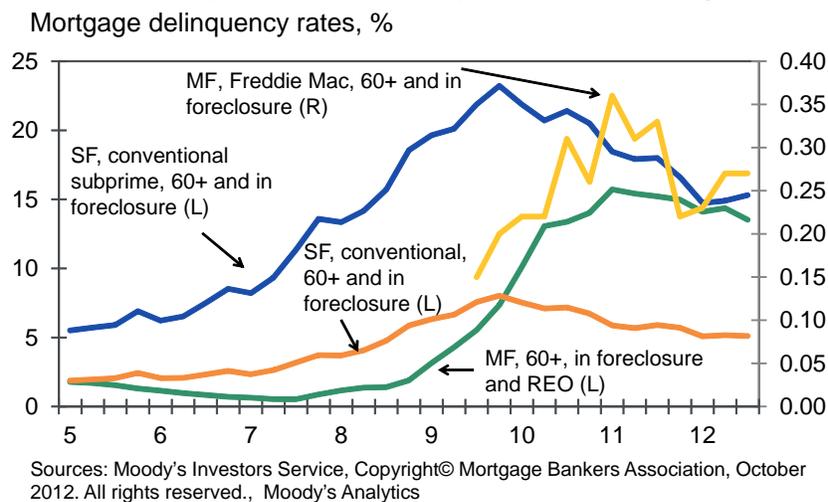
Chart 22: Mortgage Originations Recover
Multifamily mortgage originations, % change yr ago
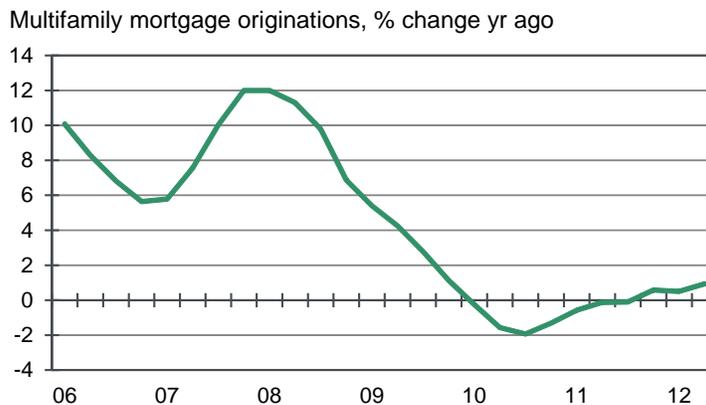
Sources: Federal Reserve Board Flow of Funds, Moody's Analytics

The easy credit extended to borrowers earlier this decade resulted in a deterioration of credit quality, particularly for loans financed by commercial mortgage-backed securities. The Moody's Investors Service Delinquency Tracker (DQT) for multifamily properties in CMBS pools indicates that the delinquency rate deteriorated more than the single-family mortgage delinquency rate but not more than the delinquency rate for conventional subprime mortgage loans (see Chart 23).[xvii] The delinquency rate for CMBS loans surged from less than 1% in 2006 to nearly 16% in the beginning of 2011. Moreover, single-family mortgage delinquency rates have been improving since their peak in 2009, but the CMBS delinquency rate has fallen just slightly. Delinquency rates for multifamily loans held or guaranteed by the GSEs and the FHA, which maintained higher qualifying standards throughout the housing boom, are in much better shape, remaining below 1%, over the past several years.

Chart 23: Apartment Delinquencies Are High

Mortgage delinquency rates, %

Sources: Moody's Investors Service, Copyright© Mortgage Bankers Association, October 2012. All rights reserved., Moody's Analytics

That delinquency rates for privately securitized loans are still high raises concerns about the outlook for these loans. Increasingly, apartment loans have maturity dates of five to 10 years. These borrowers will be hard pressed to refinance their loans. Indeed, even loans that are current, but were underwritten using more liberal qualifying standards that prevailed when they were originated, may face difficulties finding refinancing.

Multifamily outlook

The economy is on the mend and rental markets are benefiting. The economy is expanding, which is generating increased demand for housing overall and demand for rental units in particular. Stronger household growth will help rental markets grow. Falling rental vacancy rates and rising rents will entice investors back into the market. As such, multifamily construction will increase, mortgage origination volumes will accelerate, and growth in mortgage outstandings will pick up over the next several years. Longer term, measures of the housing market will return to a trend growth that is consistent with household formations. Financing for both owned homes and apartment buildings will slowly improve, although credit standards will remain more stringent than those imposed during the housing boom. Housing tenure choice will be related to demographic trends, with the high and growing share of older households driving up homeownership. Even though the homeownership rate will rise again, the number of renter households will grow due to the growth in the total number of households.

The economic recovery has been weak and federal government budget tightening will likely keep it weak through at least the first half of next year. Nonetheless, businesses are creating jobs and these jobs should help support demand for housing in the near term. Rental demand will fair especially well, as tight lending conditions and weak income growth keep potential first-time homebuyers off the market. Indeed, there are still a few signs of a recovery in this segment of the market: The share of first-time homebuyers remains stuck at 32% in the third quarter of 2012, compared with a historical average of 40%, according to the

Realtors. Over the next decade, as the economic expansion hits its stride, household growth will rise. An average of 1.3 million net new households will form per annum, compared with an average of 1.1 million households between 2002 and 2012.

The decision between renting and buying will be informed by demographic as well as economic trends. The renter rate is expected to stabilize in the next year before turning downward and settling at 33% by the beginning of the next decade (see Chart 24). In the near term, an impaired mortgage market and poor consumer credit quality and job growth will keep the renter rate high. By 2014, a strong economic expansion will drive demand for housing higher, while consumer credit quality will improve as fewer households go delinquent on their loans. Additionally, households that were foreclosed upon during the housing crash will be past the three to seven-year period usually required to repair credit and will be able to purchase homes again. Mortgage credit availability will expand for homeowners, although not nearly as much as it did during the housing boom. Concurrently, higher rents and low house prices will reduce the relative affordability of renting. Over the next decade, demographics will generate much of the decline in the renter rate, with a growing share of households aging into the highest homeownership groups.

Chart 24: Share of Renters at Peak

Renter rate, %

Sources: Census Bureau, Moody's Analytics
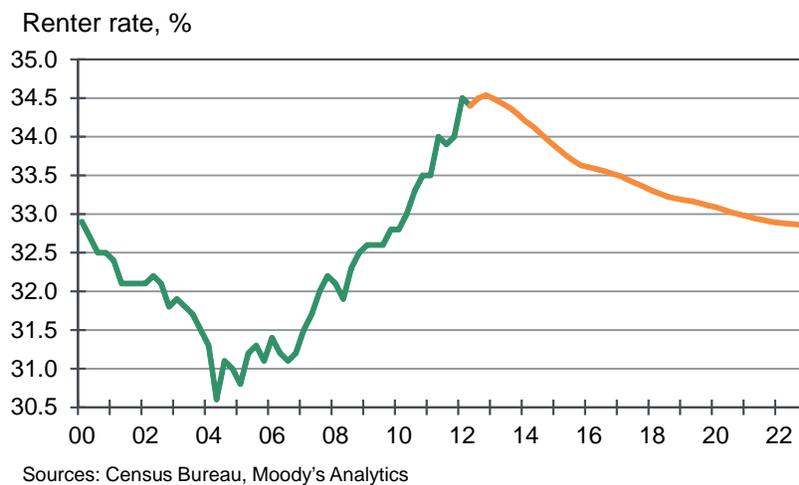
Although the share of renting households will decline, the number of renters will rise because of the increase in households. Over the next decade, the number of renter households will increase by 332,000 per annum. This pace is nearly half that of the last 10 years, which benefited from the crisis in the single-family market, but is faster than the 88,000 per year increase in renter households between 1992 and 2002. The increase in renter demand will spur additional multifamily construction. Assuming the share of rented units that are single-family returns to trends that prevailed before the extreme housing boom-bust cycle, about 75% of these renters will reside in multifamily units. On average, 353,000 multifamily units will be completed per annum over the next decade to help satisfy this demand. Financing for multifamily buildings will also return to a more sustainable pace than that which occurred during the housing boom. Over the next decade, multifamily originations are expected to increase at an average annual pace of 8%, buoyed by the appreciation in property values and a greater number of purchases.

Mortgage Rates and Credit Availability Without the GSE Guarantee

Fannie Mae and Freddie Mac provide a substantial amount of mortgage credit and liquidity to the multifamily market. These institutions are particularly instrumental in providing credit throughout the business cycle. In considering the impact of eliminating the GSEs' guarantee would have on the multifamily housing market, it is necessary to consider their impact in both tranquil and stressful economic conditions. In times of economic contraction, private lenders typically reduce the amount of credit made available for housing in general, making it difficult for homebuilders and households to access financing. Multifamily projects, in particular, tend to be large and lumpy investments with unique characteristics that may be difficult for private investors to value or benchmark against other assets. Private lenders would require a higher interest rate on their mortgage lending if the GSEs no longer backstop the entire mortgage market with their loan guarantees. How much higher is considered in this section.

Providers of multifamily mortgage credit

Multifamily mortgage debt outstanding totaled $844 billion as of the end of the first quarter of 2012, according to the Federal Reserve's Flow of Funds. These funds come from five principal sources, including:

1.   Fannie Mae and Freddie Mac

2.   The Federal Housing Administration

3.   Commercial banks, thrifts and savings institutions

4.   Private commercial mortgage-backed securities investors

5.   Life insurance companies

Fannie and Freddie are large providers of mortgage credit, accounting for about one-third of debt outstanding. Their investment portfolios totaled $261 billion in the first quarter of this year, and they guaranteed another $91 billion in mortgage securities. The GSEs have been doing an outsize share of recent origination volumes as private lenders have been much more cautious due to the recession and weak economic recovery. Together, they originated $45 billion in multifamily loans, accounting for about half of all originations (see Chart 25). The FHA has also stepped up its multifamily lending in recent years as Ginnie Mae issuance of multifamily-backed securities surged last year (see Chart 26). This government-supported lending is expected to subside as the private market heals, regardless of what happens to the GSEs.

Chart 25: GSE MF Mortgage, Security Purchases

$ bil
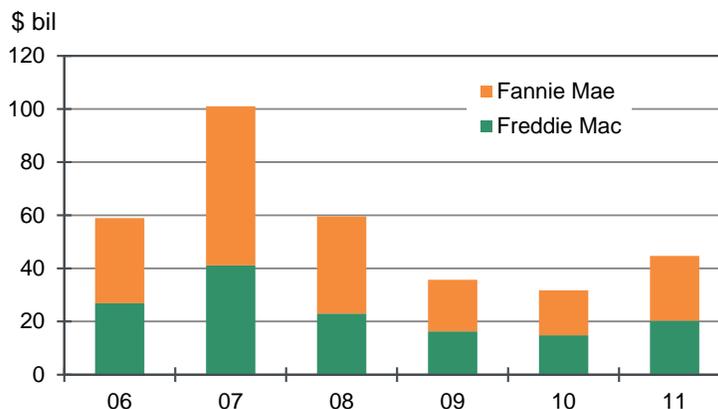
Sources: FHFA, Fannie Mae, Freddie Mac, Moody's Analytics

Chart 26: Ginnie Mae Multifamily MBS Issuance

$ bil
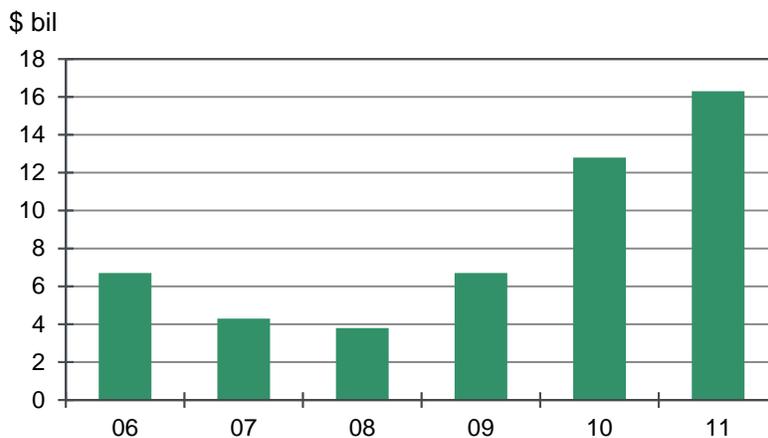
Sources: SIAC, Moody's Analytics

Commercial banks and thrifts are the largest holders of multifamily debt, although traditionally they do not compete directly with the GSEs for mortgages. Banks typically invest in either small properties (fewer than 50 units) or high-end properties in prime markets such as New York, San Francisco and Chicago. The GSEs have traditionally focused on larger properties, targeting the low- to moderate-income population. While it is possible that banks would provide financing for some additional properties in the absence of the GSEs, it is difficult to estimate how much more given the lack of overlap between the banks and GSEs historically.

In addition, the GSEs have tended to fund properties with longer-term lending, while banks have focused mainly on short-term loans and construction loans. Shorter loan terms provide a better match for banks with their deposits. The GSEs' access to capital markets and their government charters have allowed them to take a long-term view of credit throughout the economic cycle. As a result, it is not clear whether banks would have an interest in providing long-term loans given that their cost of funds is cheapest at the short end.

The ability of banks and thrifts to provide additional multifamily financing may also be hampered by new regulations. In the wake of the financial crisis, banks are facing stricter capital requirements than they have in the past. Under the limits to be finalized in the Basel III accord, banks are likely to find that many multifamily loans do not provide sufficient risk-adjusted return given their higher capital costs.

As a result of all these factors, interest rates on multifamily loans would likely have to rise by several hundred basis points to be economically attractive to commercial banks. Even at these levels, it is doubtful that banks today would have the balance sheet capacity to fund much more than $5 billion to $10 billion in additional multifamily loans. In the longer run, it is possible that additional banks, both foreign and domestic, could be attracted to the sector, but regulations and the need to match-fund are likely to keep the cost of credit 100 basis points to 300 basis points higher than the current rates provided by the GSEs.

Behind the GSEs and commercial banks, multifamily housing projects have been financed chiefly through mortgage-backed securities (see Chart 27). In this arrangement, an investment bank packages multiple mortgages together into a single security. Investors, including the GSEs, pension funds, central banks and mutual funds, purchase shares or interest in securities. Unlike the interest and principal payments of agency MBS, which are guaranteed, private CMBS are self-insured through the use of junior and senior classes or tranches. If a large number of borrowers fail to pay back their mortgages, the junior bondholders will not receive interest and principal payments. Senior bondholders will also be at risk if losses on the underlying mortgages are high enough.

Chart 27: Multifamily RMBS Outstanding Balances
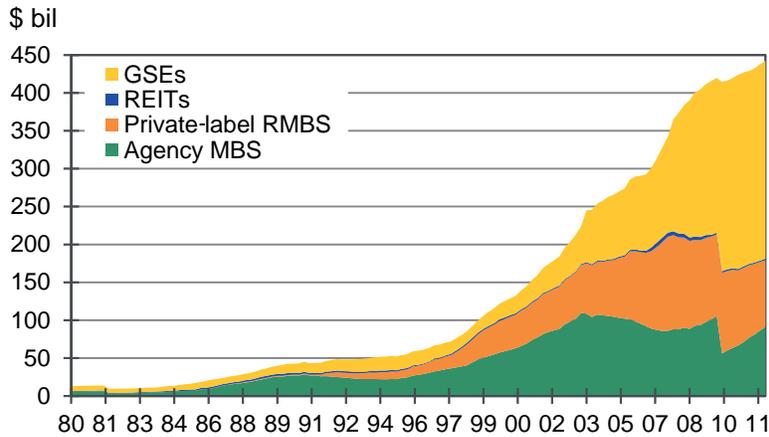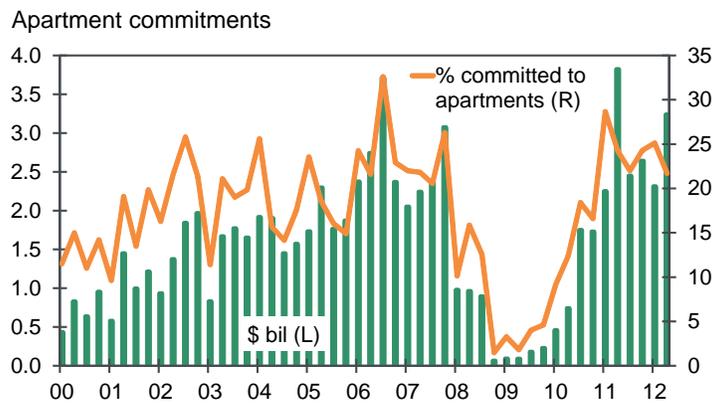

Sources: Federal Reserve, Moody's Analytics

In its heyday, investment banks were adding $40 billion to $90 billion in additional multifamily securities every year as they took market share from the GSEs. Since 2009, however, fortunes have changed, with very few CMBS deals being produced leading to the runoff of $25 billion to $35 billion per year in multifamily securities. The private CMBS market has ebbed in recent years as investor demand has waned and as litigation and regulatory uncertainty have caused investment bankers to become highly risk averse. Assuming a return to more normalized conditions, we might expect annual production of $20 billion to $25 billion, similar to what was produced in the early 2000s. However, some portion of the market will simply not return given strict regulations and a permanent change in investor preferences.

Finally, life insurers and pension funds have held 5% to 10% of mortgage debt outstanding, or about $50 billion. They have committed from $5 billion to $12 billion to apartments each over the last three years, or about 25% of all of their investments in commercial mortgage-backed securities (see Chart 28). The top five life insurers in the multifamily mortgage market are MetLife, Prudential, AIG, Manulife, and Genworth.

Chart 28: Life Insurers' Apartment Loans

Sources: Federal Reserve, Moody's Analytics

Based on an analysis of their annual 10-K reports, these insurers have dedicated relatively fixed proportions of their investment portfolios to commercial mortgages (see Table 2). Apartment buildings constitute 10% of all commercial mortgage holdings on average and 5% of all mortgages (commercial plus noncommercial). Some insurers' holdings have been considerably lower than the long-run average of 10%, including MetLife and Manulife. Assuming that all insurers increased their holdings consistent with the 10% allocation threshold, life insurance companies could pick up around $7 billion to $10 billion in multifamily assets from the GSEs, a one-time gain.

Table 2: Multifamily Assets in Portfolios of Major Life Insurers				
	MF mortgage balance, $ bil	Total mortgage balance, $ bil	% MF	Incremental w/ 10% allocation, $ bil
Life insurance companies:				
MetLife Inc.	4.01	83.99	4.8	4.39
Prudential Financial Inc.	4.52	46.99	9.6	0.18
Genworth Financial Inc.	0.64	8.05	8.0	0.16
AIG Inc.	1.82	19.49	9.4	0.13
Manulife Financial Corp.	3.70	61.60	6.0	2.46
Pension fund:				
TIAA-CREF	1.36	13.15	10.3	
Total	16.05	233.27	6.9	7.32

Sources: Company 10-K and annual reports, Copyright © Mortgage Bankers Association, September 2012. All Rights Reserved, Federal Reserve, Bloomberg, Moody's Analytics
Notes:
Ex mortgages on foreign properties and agriculture mortgages
Manulife is a Canadian insurance company; mortgage portfolio includes Canadian properties (58% avg) and U.S. properties (42% avg)
2011 financial data (except Manulife, which is 2010)

Life insurers originated about $12 billion in 2006 in new multifamily loan originations, their best year since 2000. Assuming an average growth rate of 10% per year in the size of their commercial mortgage portfolios and a constant 25% allocation to multifamily properties, the life insurers and pension funds could absorb an additional $1 billion to $2 billion of the assets currently landing on GSE balance sheets. As with commercial banks and thrifts, life insurers are likely to be quite particular in the types of multifamily assets they invest in. That is, insurance and pension funds may be more likely to invest in prime properties in key markets with high liquidity and high rental demand. More rural and/or second-tier properties that the GSEs invest in currently would likely require significantly higher yields to attract life insurers.

Assessing the interest rate impact

To quantify the impact on multifamily mortgage interest rates from the elimination of the GSEs' guarantee, it is assumed that while Fannie Mae and Freddie Mac's multifamily mortgage guarantee business is wound down, the government would not simultaneously expand the activities of the FHA. That is, we assume the FHA's role in the multifamily market would remain small and targeted at low- to moderate-income housing developments. Otherwise, rolling the GSEs' multifamily activities into the FHA would result in minimal changes to the multifamily housing market given that the GSEs have been effectively nationalized through their conservatorship. We also presume that the GSEs' multifamily holdings would be wound down over time through sales and/or attrition to not disrupt the market. Furthermore, we assume the Treasury Department would continue to provide backing for any outstanding MBS guarantees.

One approach to assessing the interest rate impact is to simply examine the difference in interest rates for agency and nonagency multifamily loans. Rate spreads rose dramatically during the financial crisis as private lenders fled the market. However, more recent data, provided by Cushman and Wakefield, suggest the spread between agency and nonagency multifamily loans is closer to its long-term historical average at approximately 50 basis points.

The rate spread itself is an insufficient estimate of the rate impact due to elimination of the GSEs. Fannie and Freddie provided indirect benefits to the nonagency market by providing a ready supply of liquidity. Investors and homebuilders know that even if the private market should dry up, the GSEs are still available to refinance loans and provide new credit. In addition, the GSE

portfolio investments provide an additional source of demand that keeps rates lower than they otherwise would be. Without this backstop or escape valve, investors need to price for the additional cost of illiquidity.

In order to estimate the full rate impact in a world without the GSEs, we first surveyed capital market participants in the multifamily market as well as other housing market analysts. A survey of Freddie Mac capital markets traders suggested the mortgage rate spread would rise 75 to 100 basis points if multifamily K-deals were to lose their government guarantees. Other housing market analysts put the rate spread impact in a similar range.

A more formal approach to assessing the interest rate impact is through the use of econometrics. Specifically, we estimated multifamily rate spreads as a function of underwriting conditions and the GSEs' market share in a reduced form equation. Given the estimated relationship provided by this equation, we can then forecast the rate impact of either increasing or decreasing the GSE share—all the way down to the 0% level under the assumption that the GSEs exit completely.

Results from our econometric exercise are provided in Table 3. In the first column, we used data on the monthly average multifamily interest rate provided by Freddie Mac in computing the rate spread over the 10-year Treasury rate. Based on this regression analysis, a 1% increase in the GSE market share reduces the rate spread by 3.1 basis points. Given that the current GSE market share is close to 40%, including their portfolio holdings and agency securities, according to the Federal Reserve's Flow of Funds, the elimination of the GSEs would result in rates rising by 124 basis points.

Table 3: Multifamily Interest Rate Spread			
	[1]	[2]	[3]
	Dependent Variable		
	Avg MF rate (Freddie Mac) - 10-yr Treasury rate	Avg MF rate (ACLI) - 10-yr Treasury rate	Avg MF rate (ACLI) - 10-yr Treasury rate
AAA to A spread	0.9191	1.4091	1.6830
	(0.3032)	(0.1858)	(0.2015)
Apartment Availability Index	23.3955		
	(19.9116)		
Market Tightness Index	0.0027		
	(0.0029)		
% GSE market share (portfolio plus MBS)	-3.1110	-1.8284	-3.2871
	(3.9715)	(0.9822)	(1.0692)
Avg LTV		-0.0278	-0.0108
		(0.0173)	(0.0181)
Intercept	0.0186	3.3291	2.3866
	(2.3649)	(1.3097)	(1.3380)
R-squared	0.6119	0.5120	0.5692
Time period	1/1/1994-12/31/2011	1/1/1994-3/31/2012	1/1/1994-12/31/2010
N	48	73	68
Note: Standard errors in parentheses			

In the second and third columns, we substituted the interest rate series provided by the American Council of Life Insurers for the Freddie Mac average interest rates. This permitted us to test and either validate or refute the previous result. In addition, the ACLI data have the advantage of having a longer available history. Based on the results in column two, we find that a 1% increase in the GSE market share reduces the rate spread by 1.8 basis points. This translates into a rate spread of 72 basis points.

However, in examining the interest rate data, we found a significant decline in interest rates since early 2006. We attribute this decline to the dearth of credit provided during this extraordinary time period. If only deals of exceptional quality were executed during this time period, it may skew the results and may not be representative of a normal mortgage market. To test the robustness of the specification, we repeated the regression analysis on data through the end of 2010 in column three. Excluding the most recent time period, we find that a 1% increase in the GSE market share reduces the rate spread by 3.3 basis points, a result very similar to column one. This translates into a rate spread of 132 basis points if the GSE market share is reduced to 0.

Based on these regression results as well as the survey results, we estimate that interest rates on multifamily mortgages would rise by 75 to 150 basis points in the event that the GSE investment portfolios and MBS guarantees are eliminated. We note that this is an estimate for the average rate increase. The increase is likely to be lower in prime real estate markets, where competition from private investors and banks is healthy. The increase is understated for second- and third-tier real estate markets, where competition is less robust, and in rural areas, where access to local or regional banks may be limited or nonexistent.

Multifamily Market Submodel

To quantify the impact of the loss of the GSE guarantee on the multifamily housing market and the broader economy, the Moody's Analytics model of the U.S. economy has been expanded to more fully capture activity in the multifamily sector. The U.S. macro model is a large-scale structural model of the U.S. economy used for forecasting, scenario analysis, stress testing and policy analysis. The expansion of the U.S. macro model allows for greater interaction between the economic, financial and demographic drivers of the multifamily housing market and the performance of multifamily market. Moreover, it captures the indirect effects that multifamily market activity has on the broader economy primarily through multifamily construction and construction employment. To assess differences in the impact of the loss of the GSE guarantee on metropolitan area multifamily markets, the multifamily sector of Moody's Analytics metro area models for the nation's 15 largest metropolitan areas were also expanded to capture key measures of multifamily market activity. This section describes the expansion of the multifamily market submodels of the U.S. macro and metro area models to accommodate policy levers that can capture the loss of the GSE guarantee.

Multifamily submodel

The U.S. macro model has been expanded to include a multifamily submodel with equations for multifamily permits, starts, completions and stock, rental vacancy rates, effective rents, multifamily property prices, and multifamily mortgage originations. The broad contours of the structure of the multifamily submodel are depicted in Chart 29.

**Chart 29: Structure of the Multifamily Submodel**
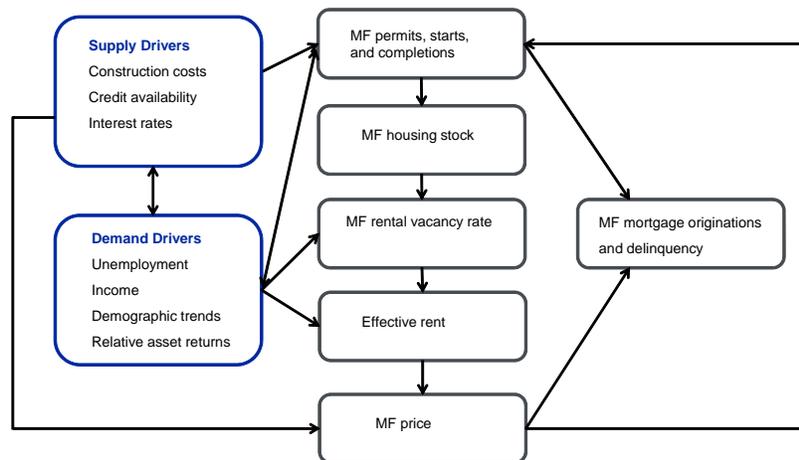
Demand and supply-side factors from the rest of the macro model drive multifamily permits. With appropriate lags, permits lead to starts and completions and then to additions to the housing stock. The supply and demand for multifamily units drives the rental vacancy rate, which in turn determines effective rents. Rents and interest rates determine prices for multifamily properties. Multifamily completions and prices determine multifamily origination volumes. There is feedback from the multifamily submodel to the rest of the U.S. macro model through multifamily construction, which drives multifamily residential investment, and construction employment. The credit performance of multifamily properties also has feedback effects on broader financial conditions and the availability and cost of credit.

Economic theory and the availability of historical data are used to select the explanatory variables included in the equations of the multifamily submodel. Expectations regarding the relationships among these variables provide strong guidance during the estimation of the equations. The model was simulated over history with an eye toward accuracy and tested for the sensitivity of its response to changes in housing policy. The equations for permits, starts, completions and stocks are all estimated for structures

with two to four units and those with five or more (see Chart 30). A complete list of the endogenous variables in the multifamily submodel can be found in Table 4.

## Chart 30: 5+ Units Dominate MF Housing Starts

Multifamily units, mil
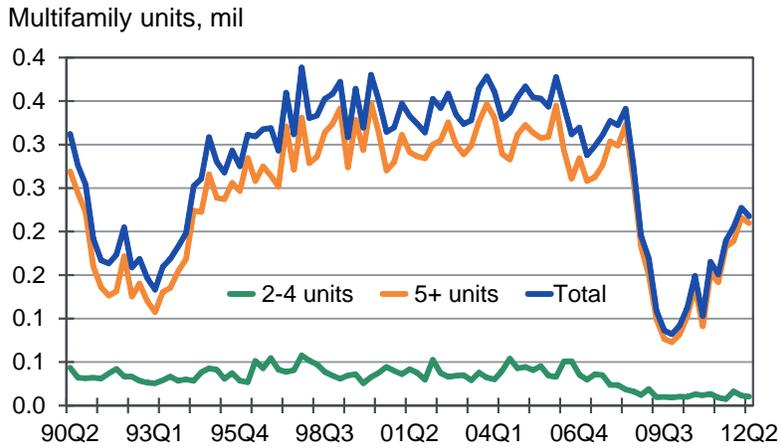
Sources: Census Bureau, Moody's Analytics

Table 4: U.S. Multifamily Submodel Variables	
Variable	**Source**
Absorption, rental housing stock, 2-4 units	Transformation
Absorption, rental housing stock, 5+ units	Transformation
Effective rent	REIS
Housing completions: New privately owned housing units - 2-4 units, ths, SAAR	U.S. Macro
Housing completions: New privately owned housing units - 5+ units, ths, SAAR	Census
Housing completions: New privately owned housing units - multifamily, ths, SAAR	Census
2-4 units authorized building permits, ths, SAAR	Census
5+ units authorized building permits, ths, SAAR	Census
5+ unit share of total MF permits	Census
Multifamily permits, ths, SAAR	Transformation
Housing starts: 2-4 units privately owned, ths, SAAR	Census
Housing starts: 5+ more privately owned, ths, SAAR	Census
MF housing stock, share of 2-4 units	AHS, Moody's Analytics
MF housing stock, share of 5+ units	AHS, Moody's Analytics
Moody's Commercial Property Price Index, w/ back forecast	Moody's Analytics, est.
MF housing stock, share of 2-4 units	AHS, Moody's Analytics
MF housing stock, share of 5+ units	AHS, Moody's Analytics
Housing stock: Multifamily, ths, SAAR	Census
MF housing stock, occupied rental, 2-4 units	AHS, Moody's Analytics
MF housing stock, occupied rental, 5+ units	AHS, Moody's Analytics
Housing stock: Renter occupied - multifamily, ths, SAAR	AHS, Moody's Analytics
MF housing stock, rental, 2-4 units	Moody's Analytics
MF housing stock, rental, 5+ units	Moody's Analytics
Vacancy rate, %	REIS
Rental vacancy rates: 2 to 4 units, %, NSA	Census
Rental vacancy rates: 5 or more units, %	Census
MF mortgage originations	FOF

The fundamental supply side variable in the multifamily submodel is multifamily permit issuance, the first step in the homebuilding process. Permits in turn drive starts, completions, and ultimately the housing stock. There are four principal determinants of multifamily permits per household, including the multifamily mortgage interest rate, the multifamily property price, construction costs, and a measure of the availability of credit (see Appendix Table 1). Because there is no broad multifamily mortgage rate measure with a sufficiently long historical time series, a synthetic mortgage rate was constructed from a weighted average of the Freddie Mac multifamily mortgage commitment rate and the Baa corporate bond rate. The Freddie Mac rate is lower than rates charged by other providers of mortgage credit, which are proxied by the Baa corporate rate (see Chart 31). This is particularly true when market interest rates spiked during the financial crisis; the Freddie Mac multifamily interest rate remained largely unchanged, a reflection of its risk-free status in the eyes of investors.

### Chart 31: Multifamily Mortgage Rate
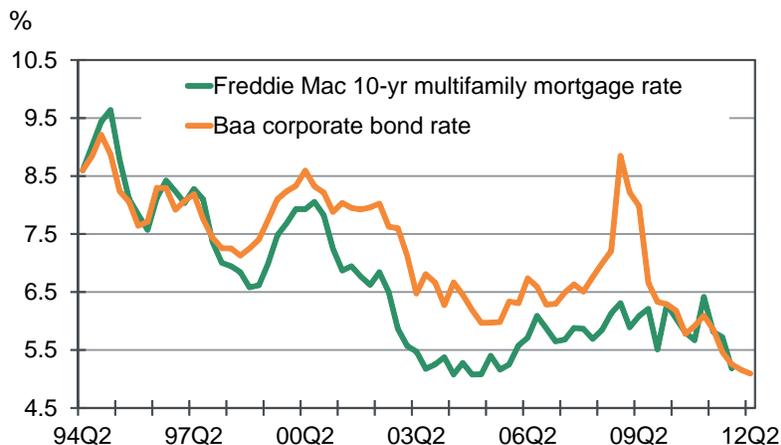
Sources: Freddie Mac, Moody's Investors Service, Moody's Analytics

Also included in the permit equation are multifamily property prices and construction costs.[xviii] The property price index is a repeat-sales index constructed by Moody's and Real Capital Analytics and is based on actual transactions for multifamily properties. Construction costs are based on a survey conducted by Engineering News Record (see Chart 32). An increase in multifamily property prices relative to construction costs induces builders to increase construction. Property prices boomed during the housing bubble and fell dramatically during the collapse. Construction costs, with a large labor cost component, generally showed more stability over the period, although they also rose during the housing boom.

## Chart 32: Wild Swings in Multifamily Prices

Annualized % change
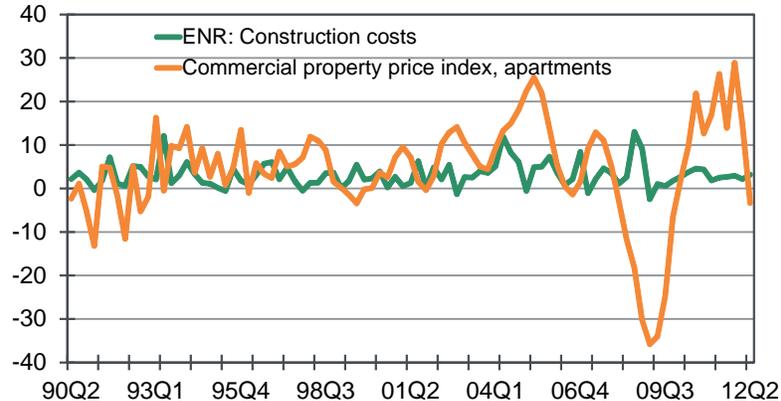
Sources: Engineering News Record, Moody's Investors Service, Moody's Analytics

Credit availability also has a significant impact on the ability of developers to get the financing needed to build. The Federal Reserve's survey of commercial bank loan officers, which tracks the net percentage of banks reporting tighter lending standards, is used as a proxy for the availability of multifamily mortgage credit. The Fed Loan Officer Survey shows a dramatic tightening in underwriting standards during the financial crisis and a more recent easing in standards as market conditions have improved (see Chart 33).

Chart 33: Banks Loosen Lending Standards

Net percentage of banks tightening standards, %, NSA
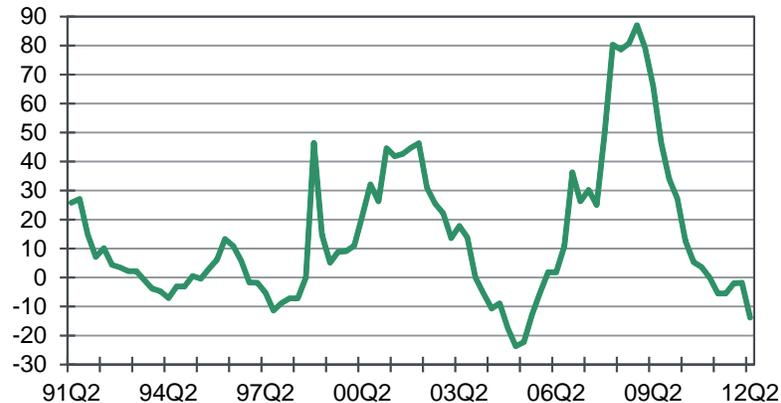
Sources: Federal Reserve, Moody's Analytics

There is a lag between when a permit is issued for new construction and when a builder decides to break ground on the project and when the building is ultimately completed. According to the Census Bureau, 85% of permits turned into a start within the first quarter after the permit was authorized in 2011, and 74% of housing starts were completed within one year. This lag structure was used in modeling the multifamily starts and completions data (see Appendix Table 2).[xix] The estimated

coefficients indicate that permits are fully reflected in starts over a period of three quarters, where approximately one-half of the permits are actually started in the same time period, and the remainder are started over the next two quarters. The strength of the economy, as proxied by the unemployment rate, does impact the pace at which permits translate into starts, as will an increase in construction costs.

The equation for housing completions relies on housing starts in a similar manner. The only independent variable in the equation for completions in projects with five more units is housing starts for five or more units (see Appendix Table 3). The coefficient on housing starts is estimated with a third order polynomial distributed lag. The pattern of coefficients over time, first rising and then falling slowly, captures the Census Bureau's more complicated computations. The fit of the equation is good, which suggests that this equation approximates the Census procedures well. Housing completions are then used to determine the stock of housing units. Housing stock is driven by last quarter's stock and this quarter's completions (see Appendix Table 4). The coefficient on the lagged housing stock is meant to capture housing depreciation.

Rental vacancy rates are measured based on data from REIS Inc., which largely reflects projects with 40 or more units. This breakdown differs from the 2-4 and 5+ categories that have been used in the rest of the submodel, but the 40+ category better mirrors trends in the 5+ category. The impact of changes in the supply of multifamily housing on vacancy rates is captured by changes in completions of 5+ units per household (see Appendix Table 5). More completions represent increased supply and thus increase the vacancy rate. Demand for rental housing is captured by a number of variables, including the share of the population between 40 and 50 years of age. Since this age cohort has high rates of homeownership, when its share of the population is rising, the rental vacancy rate will increase. The single-family housing affordability index is another demand-side variable that captures the attractiveness of homeownership versus renting. Increases in the unemployment rate will impede household formation, and this will also cause the vacancy rate to increase. Finally, the share of investment in information technology relative to GDP captures the impact of the technology boom around Y2K on rental housing when more young renter households formed as the very strong job market enticed them to go to work sooner than they would have otherwise.

Effective rents are also provided by REIS Inc. Linkages from the broader U.S. macro model are important in the equation for effective rents (see Appendix Table 6). The overall rate of inflation, as measured by the consumer price index is especially important; about three-quarters of the rate of inflation passes through to effective rents. In addition, growth in per household real disposable income also impacts rents positively. Increases in the lagged rental vacancy rate put downward pressure on rents. The effective rent equation also includes contemporaneous changes in the vacancy rate in order to capture short-run cyclical effects.

Multifamily property prices are determined by the discounted future stream of multifamily effective rents (see Appendix Table 7). The Baa corporate bond yield is used as the discount rate in the equation. The median price for single-family homes is also included in the equation to capture the potential conversion of rental units into condominiums.

Finally, multifamily mortgage originations are simply driven by multifamily property prices and the multifamily housing stock (Appendix Table 8).

To evaluate the simulation properties of the multifamily submodel, it is simulated under different assumptions regarding the multifamily mortgage interest rate, the multifamily property price, construction costs, and the availability of credit. Each simulation increases one of these variables and holds it at the higher level for the duration of the simulation. This type of simulation provides a sense of the magnitude of the impact of changes to the drivers over time, in contrast with the static elasticities derived from the regression results. In separate simulations, each of the four driver variables are increased by 10% for a three-year period, while holding everything else unchanged.

A sustained rise in the multifamily mortgage rate results in a more than 7% reduction in the rate of permitting (see Table 5). At the end of three years, during which the reductions in permitting have been reflected in reductions in starts, completions and ultimately the housing stock, the multifamily housing stock is reduced by 13 basis points compared to what it would have been absent any change. In contrast, a 10% increase in the multifamily property price increases the rate of permitting by more than 16% and thus results in a 29-basis point increase in the housing stock. Note that mortgage originations increase substantially since not only has construction increased, but so too has the value of that construction. A sustained 10% increase in construction costs or credit standards has a large impact on multifamily housing activity.

Table 5: Impact on the Multifamily Market of Various Shocks

*Percent impact at the end of 3 yrs from a 10% increase in shock variable*

	Permits	Stock	Originations
Multifamily property mortgage interest rate	-7.2	-0.13	-0.21
Multifamily property price	16.1	0.29	17.3
Construction costs	-32.1	-0.76	-1.23
Credit availability	-0.9	-0.08	-0.12

Source: Moody's Analytics

Metropolitan area model

To quantify the impact of the loss of the GSE guarantee on metropolitan area multifamily markets, the multifamily submodel of the Moody's Analytics metro area models were expanded for 15 metro areas (see Chart 34). The areas include Washington, New York, Atlanta, Dallas, Los Angeles, Houston, Chicago, Seattle, Philadelphia, Phoenix, San Diego, Boston, Minneapolis, San Francisco and Miami. Some of the largest class A apartment markets in the nation, Washington, New York, Los Angeles, Chicago, Boston and San Francisco, are designated as major market areas for the purposes of this study. The remainder of the markets are designated as non-major market areas. The non-major markets considered in this study are still large relative to many metro areas in the nation. Analysis, including even smaller markets, yielded unsatisfactory regression results, likely a consequence of the quality of data in the smaller areas. Nonetheless, the multifamily markets in the non-major, metro area markets presented in this study are found to be more sensitive to changes in multifamily mortgage rates and credit availability.

Chart 34: Metro Area Multifamily Submodel
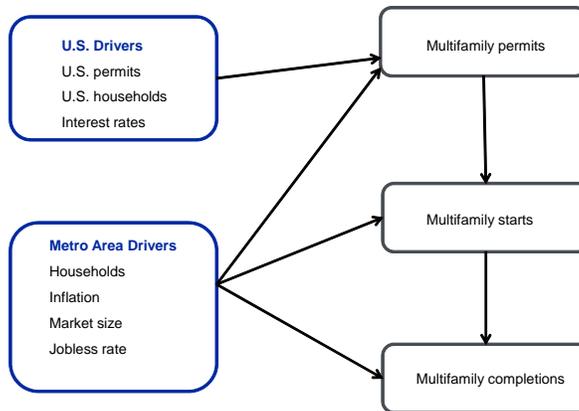
The multifamily submodel includes equations for multifamily permits, starts and completions in buildings with two or more units (see Appendix Tables 9-11). The equations are estimated as pooled regressions. This technique combines all the metro area time series data and allows the estimation of a single equation that can be used for all metro areas. Whenever possible, a single coefficient is estimated rather than one for each metro. This results in a model that is easier to understand, is stronger in a statistical sense as it incorporates a larger historic data set, and can be counted on to respond to external shocks in a reasonable way.

Consider, for example, the metro area equation for multifamily housing permits (see Appendix Table 9). The dependent variable for multifamily permits for the metro area is expressed on a per household basis. It is driven by U.S. multifamily permits, also

expressed on a per household basis, and the metro area real multifamily mortgage rate, which is measured by the difference between the nominal national mortgage interest rate and metro area consumer price inflation. Different coefficients are estimated for the real mortgage rate for major metro area markets and for non-major metro areas. The real mortgage rate has a larger coefficient for non-major metro areas.

The metro area multifamily housing starts equation is similar to the U.S. housing starts equation (see Appendix Table 10). Multifamily permits lead to a start within two quarters. A rise in the metro area unemployment rate slows down the conversion process.[xx] Just as in the U.S. macro model, multifamily housing starts translate into completions over a two-year period. Starts are interacted with the major metro area market dummy variable with the four-quarter moving averages (current and prior year). For the major markets, completions are more skewed into the second year of the project's lifetime, which is consistent with the intuition that multifamily housing projects are probably larger in major metro areas and thus take longer to complete (see Appendix Table 11).

Losing the GSE Guarantee

The final section of this study quantifies the impact of the loss of the GSE guarantee on the U.S. and metropolitan area multifamily markets. The Moody's Analytics U.S. and metro area models with the expanded multifamily market submodels are simulated under different scenarios for the cost of multifamily mortgage credit and the availability of that credit.

 Five different policy scenarios are considered. The first four scenarios (P1–P4) investigate the impact of the loss of the GSE guarantee beginning in the first quarter of 2013 under the assumption that the economy and financial markets are operating normally. That is, the economy is near its potential and growing at a pace consistent with its potential growth rate. The scenarios are generated by varying the increase in multifamily mortgage rates due to the loss of the guarantee. As considered in section III of this study, under reasonable assumptions, the loss of the GSE guarantee will increase multifamily mortgage rates by between 75 and 150 basis points. The scenarios considered include a 75-basis point increase (P1), 100-basis point increase (P2), 125-basis point increase (P3), and a 150-basis point increase (P4). It is assumed in all of these scenarios that all other government housing policies remain unchanged, including the wide range of government subsidies provided to the single-family housing market.

The fifth scenario (Q1) explores what would happen if the multifamily market had no GSE backstop in a recessionary economy and when financial markets are under significant stress as they were during the Great Recession. The economic backdrop would be similar to Moody's Analytics S4 scenario in which the economy is suffering a protracted slump.[xxi] In this scenario, the combination of the much weaker economy and heightened financial market tensions results in much higher multifamily mortgage rates, much tighter credit conditions, and wider risk premiums in financial markets.
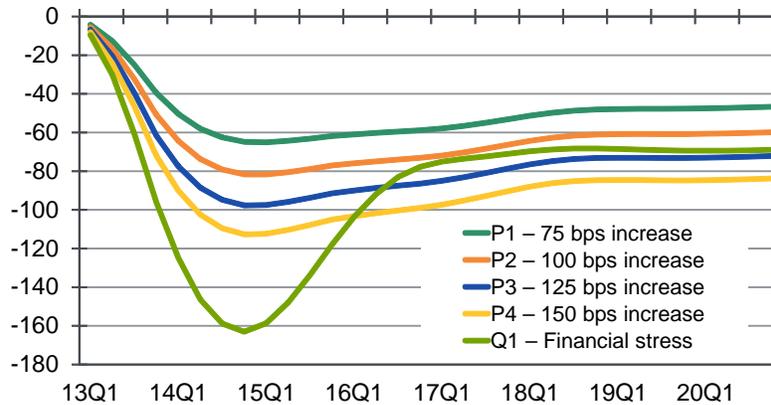
The peak impact of these scenarios on multifamily housing permits and completions, the unemployment rate, and real GDP are summarized in Table 6. For each of these variables, the table shows the maximum impact of the loss the GSE guarantee. For example, in the P2 scenario in which multifamily mortgage rates increase by 100 basis points due to the loss the guarantee, multifamily permits are reduced by 86,000 units at the worst of the impact, contributing to a loss of $29 billion in GDP, and an increase of 0.3 percentage point in the unemployment rate. The time path of the impact of the loss of the guarantee on multifamily permits is shown in Chart 35. Under P2, in the long run, once all of the cyclical effects of the loss of the guarantee are ironed out, permits are some 60,000 units lower than they would be otherwise.

Table 6: The Economic Impact of Removing the Government Guarantee on GSE Multifamily Loans
Difference from the government guarantee at peak impact

| | Stable Financial Market Condition Without Guarantee | | | | Financial Market Turmoil Without Guarantee |
	P1	P2	P3	P4	Q1
Multifamily permits, ths of units	-68.6	-86.4	-103.4	-119.4	-173.6
(Percent difference from base)	-14.8	-18.6	-22.3	-25.7	-62.3
Multifamily completions, ths of units	-60.0	-75.6	-90.3	-104.1	-143.4
(Percent difference from base)	-14.9	-18.8	-22.4	-25.9	-86.5
Multifamily Mortgage Originations, $ bil	-16.9	-21.3	-25.5	-29.6	-34.2
(Percent difference from base)	-9.8	-12.4	-14.9	-17.3	-20.0
Multifamily commercial property price, 2000=100	-10.3	-13.2	-16.1	-18.9	-27.1
(Appreciation, percent point difference from base)	-5.7	-7.2	-8.8	-10.3	-14.8
Effective rent ($ per month)	2.5	2.7	2.9	3.1	3.6
(Appreciation, percent point difference from base)	0.2	0.2	0.2	0.3	0.3
Unemployment rate (percentage points)	0.2	0.3	0.4	0.4	0.6
Real GDP, 2005$ bil	-22.8	-23.7	-24.8	-25.9	-41.3
(Percent difference from base)	-0.2	-0.2	-0.2	-0.2	-0.3

P1 75-basis point increase in the effective commercial mortgage rate due to loss of government guarantee
P2 100-basis point increase in the effective commercial mortgage rate due to loss of government guarantee
P3 125-basis point increase in the effective commercial mortgage rate due to loss of government guarantee
P4 150-basis point increase in the effective commercial mortgage rate due to loss of government guarantee
Q1 Financial market turmoil

Sources: Census Bureau, Bureau of Labor Statistics, Bureau of Economic Analysis, Moody's Analytics

Chart 35: The Hit to Multifamily Construction…

Multifamily permits, impact of the loss of GSE guarantee, ths units

Source: Moody's Analytics

The loss of the guarantee has a much more significant impact on the multifamily market and the broader economy in a stressed economic and financial environment. In the Q2 scenario, the peak impact on multifamily starts is a much larger 174,000 units. Given how weak conditions are even before the loss of the guarantee, multifamily construction comes to a near standstill at the height of the downturn without the guarantee. Close to $50 billion in real GDP is lost at the peak impact in this scenario, pushing the unemployment rate up by 0.6 percentage point. The time path of the impact of the loss of the guarantee on real GDP is shown in Chart 36.

Chart 36: …And Real GDP

Real GDP, impact of the loss of GSE guarantee, 2005$ bil
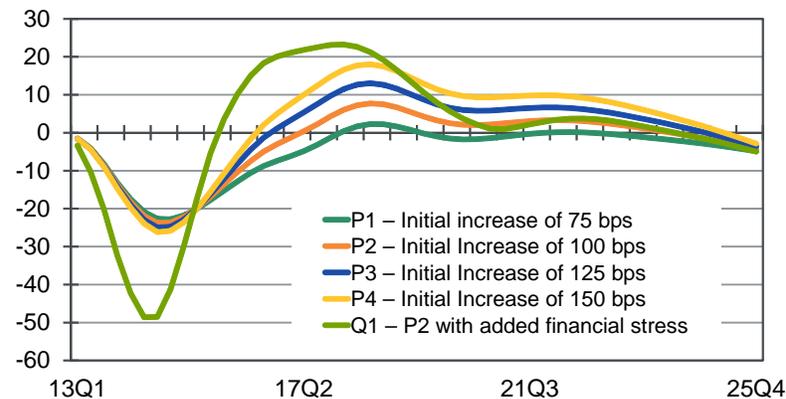
Sources: BLS, Moody's Analytics

The impact on the multifamily market and economy of the nation's 15 largest metro areas of the five policy scenarios is also assessed. The results of the simulations for the major metro areas (five largest areas) and non-major metro areas (other 10 areas) are summarized in Table 7. The results mirror closely those seen for the nation as a whole. That is, the negative effects steadily

increase for the scenarios P1 through P4, and are much greater for the darker Q1 scenario. Multifamily construction holds up better in the major metro areas than in the non-major metro areas, as private sources of multifamily mortgage credit are less willing to provide credit to areas that have less diverse economies and populations. The relative strength of the major markets compared with secondary and tertiary markets is likely larger than that observed between the major and non-major markets that this study considers. As the scenarios grow more severe, the differences in multifamily construction between the major and non-major metro areas increase.

Table 7: Metropolitan Area Impact of the Loss of the GSE Guarantee
Percent deviation from baseline 8 qtrs after the loss of the guarantee: Major vs. Non-Major Markets

	Policy Simulation				
	P1	**P2**	**P3**	**P4**	**Q1**
Completions					
Major markets	-7.9%	-10.2%	-12.3%	-14.4%	-20.3%
Non-major markets	-8.9%	-11.4%	-13.8%	-16.1%	-22.8%
Difference	-1.0%	-1.3%	-1.5%	-1.7%	-2.6%
Mortgage Originations					
Major markets	-13.7%	-17.2%	-20.6%	-23.8%	-27.6%
Non-major markets	-14.4%	-18.1%	-21.7%	-25.1%	-29.7%
Difference	-0.8%	-1.0%	-1.1%	-1.3%	-2.1%
Housing Stock					
Major markets	-0.10%	-0.13%	-0.15%	-0.18%	-0.25%
Non-major markets	-0.21%	-0.26%	-0.32%	-0.37%	-0.52%
Difference	-0.11%	-0.14%	-0.17%	-0.19%	-0.27%

The loss of the GSE guarantee has a significant negative impact on the multifamily market, particularly under stressed economic scenarios and for non-major metropolitan areas. In reality, the effect would likely be even larger than estimated in this analysis, as even the expanded models used to quantify the effects are not fully picking them up. It is difficult to statistically capture in a model the full range of impacts given the lack of experience and thus historical data without a government guarantee.

Conclusion

This study considers what would happen to the multifamily market, and the housing market and economy more broadly, if multifamily mortgage lending were no longer supported by government guarantees provided by Fannie Mae and Freddie Mac. Privatization would meaningfully raise the cost and reduce the availability of multifamily mortgage credit. The impact of the absence of the GSEs on the broader economy would be modest during normal times, but the loss of the government backstop during economic crises would have more serious negative consequences. The absence of the GSEs would also hurt smaller metro areas more than it would hurt the major metro areas.

The costs of borrowing would increase as private providers of mortgages—including depository institutions, life insurance companies, pension funds, and conduits—would require a higher return to fill the credit void left by the exiting GSEs. Not only do private providers not have sufficient capital or the requisite risk appetite to make mortgage loans on the same terms as the GSEs, the GSEs also ensure that the multifamily mortgage market remains liquid in tough economic times. Under reasonable assumptions and a well-functioning economy, without the GSEs, multifamily mortgage rates would rise between 75 and 150 basis points. This would meaningfully reduce the supply of rental housing and ultimately require households to pay more in rent.

Of more concern, however, is what would happen if financial markets and the economy again suffered an event similar to the Great Recession. Without government support, multifamily housing construction would come to a virtual standstill. Borrowing costs would surge and credit availability would collapse so that construction activity would all but stop. Not only would this have a serious impact on the availability and cost of rental housing, but the hit to multifamily activity would be so significant it would also have a large impact on the broader economy.

Given how undesirable these prospects, it is desirable for the multifamily market to have some type of government. Such a hybrid system could take many forms, but the most attractive would retain several roles for the federal government—insuring the system against catastrophe, standardizing the securitization process, regulating the system, and providing whatever subsidies are deemed appropriate by policymakers to disadvantaged households. Private markets would provide the bulk of the capital underpinning the system and originate and own the underlying mortgages and securities.

Appendices

Table 1: U.S. Multifamily Housing Permits Equation

Dependent variable: Change in the log of multifamily permits per household

Sample (adjusted): 1995Q1 to 2011Q4

Included observations: 68 after adjustments

R-squared	0.385
Adjusted R-squared	0.356
S.E. of regression	0.085
F-statistic	0.46
Durbin-Watson stat	2.42

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG Moody's multifamily property price index, 4-qtr MA	1.5707	0.3760	4.2	0.0001
DLOG construction cost index, 4-qtr MA	-4.0545	1.2891	-3.1	0.0025
Change in multifamily mortgage interest rate, 4-qtr MA	-0.1235	0.0610	-2.0	0.0471
Change in net percentage of banks - tightening standards for CRE loans, 4-qtr MA	-0.0040	0.0019	-2.1	0.0378

Table 2: U.S. Multifamily Housing Starts (5 units or more) Equation

Dependent variable: Log of privately owned housing starts (5 units or more)

Sample (adjusted): 1978Q2 to 2012Q2

Included observations: 137 after adjustments

Convergence achieved after 6 iterations

R-squared	0.953
Adjusted R-squared	0.952
S.E. of regression	0.101
F-statistic	1.35
Durbin-Watson stat	2.17

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Change in unemployment rate	-0.0677	0.0327	-2.1	0.0403
DLOG implicit price deflator for construction over chain-type price index for GDP, 4-qtr MA	-3.1333	1.5888	-2.0	0.0507
Polynomial distributed lag of multifamily permits (5 units or more) over 2 qtrs	0.3615	0.0037	97.1	0.0000
Autoregressive term	0.3415	0.0816	4.2	0.0001
0-qtr polynomial distributed lag	0.5423	0.0056	97.1	
1-qtr polynomial distributed lag	0.3615	0.0037	97.1	
2-qtr polynomial distributed lag	0.1808	0.0019	97.1	

Table 3: U.S. Multifamily Housing Completions (5 units or more) Equation

Dependent variable: New privately owned housing completions (5 units or more)
Sample (adjusted): 1980Q1 to 2011Q4
Included observations: 128 after adjustments

R-squared	0.942			
Adjusted R-squared	0.941			
S.E. of regression	0.027			
F-statistic	0.09			
Durbin-Watson stat	1.21			

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Polynomial distributed lag of multifamily housing starts (5 units or more) over 7 qtrs, lagged 1 qtr	0.1614	0.0214	7.6	0.0000
Polynomial distributed lag of multifamily housing starts (5 units or more) over 3 qtrs, lagged 1 qtr	-0.0257	0.0075	-3.4	0.0009
Polynomial distributed lag of multifamily housing starts (5 units or more) over 2 qtrs, lagged 1 qtr	-0.0067	0.0049	-1.4	0.1755
0-qtr polynomial distributed lag	0.1496	0.0371	4.0	
1-qtr polynomial distributed lag	0.1776	0.0114	15.6	
2-qtr polynomial distributed lag	0.1794	0.0215	8.4	
3-qtr polynomial distributed lag	0.1614	0.0214	7.6	
4-qtr polynomial distributed lag	0.1301	0.0131	9.9	
5-qtr polynomial distributed lag	0.0918	0.0084	11.0	
6-qtr polynomial distributed lag	0.0531	0.0145	3.7	
7-qtr polynomial distributed lag	0.0204	0.0146	1.4	

Table 4: U.S. Multifamily Housing Stock (5 units or more) Equation

Dependent variable: Log of multifamily housing stock (5 units or more)
Sample (adjusted): 1986Q1 to 2009Q4
Included observations: 96 after adjustments

R-squared	1.000			
Adjusted R-squared	1.000			
S.E. of regression	0.002			
F-statistic	0.00			
Durbin-Watson stat	0.33			

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Log multifamily housing stock (5 units or more), lagged 1 qtr	1.0007	0.0001	13082.0	0.0000
Log multifamily housing completions (5 units or more)	0.0024	0.0006	4.4	0.0000

Table 5: U.S. Vacancy Rate (40 units or more) Equation

Dependent variable: Change in the log of vacancy rate (40 units or more)

Sample (adjusted): 1981Q1 to 2010Q2

Included observations: 118 after adjustments

R-squared	0.426
Adjusted R-squared	0.401
S.E. of regression	0.027
F-statistic	0.08
Durbin-Watson stat	0.81

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG fixed investment as a percentage of gross domestic product	-0.4003	0.1181	-3.4	0.0010
DLOG total foreclosures started, lagged 12 qtrs, 8-qtr MA	-0.1420	0.1293	-1.1	0.2744
DLOG privately owned multifamily housing completions (5 units or more) per household, 10-qtr MA	0.2874	0.0757	3.8	0.0002
DLOG population age 40-49, 10-qtr MA	0.7179	0.4393	1.6	0.1050
DLOG composite housing affordability index, 4-qtr MA	0.3118	0.1258	2.5	0.0147
DLOG unemployment rate, 4-qtr MA	0.4091	0.0801	5.1	0.0000

Table 6: U.S. Effective Rent Equation

Dependent variable: Change in the log of effective rent in dollars

Sample (adjusted): 1988Q1 to 2010Q2

Included observations: 90 after adjustments

R-squared	0.380
Adjusted R-squared	0.358
S.E. of regression	0.005
F-statistic	0.00
Durbin-Watson stat	1.22

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG urban consumer CPI for all items	0.7631	0.0650	11.7	0.0000
DLOG disposable personal income per household	0.2383	0.0603	4.0	0.0002
DLOG vacancy rate (40 units or more), 16-qtr MA	-0.1315	0.0298	-4.4	0.0000
Change in vacancy rate (40 units or more)	-0.0071	0.0030	-2.4	0.0192

Table 7: Moody's Multifamily Property Price Index Equation

Dependent variable: Change in the log of Moody's commercial property price index
Sample (adjusted): 1995Q1 to 2011Q4
Included observations: 68 after adjustments

R-squared	0.541
Adjusted R-squared	0.526
S.E. of regression	0.023
F-statistic	0.03
Durbin-Watson stat	0.40

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG effective rent in dollars, 4-qtr MA	0.6379	0.3173	2.0	0.0485
DLOG median exisiting single-family home price, 4-qtr MA	1.0405	0.1892	5.5	0.0000
Baa corporate bond yield, 4-qtr MA	-0.0552	0.0156	-3.5	0.0007

Table 8: Mortgage Originations Equation

Dependent variable: Change in the log of mortgage originations
Sample (adjusted): 2000Q2 to 2010Q4
Included observations: 43 after adjustments

R-squared	0.479
Adjusted R-squared	0.479
S.E. of regression	0.066
F-statistic	0.18
Durbin-Watson stat	0.88

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG product of Moody's commercial price index and multifamily housing stock	1.6260	0.2530	6.4	0.0000

Table 9: Pooled MSA Multifamily Housing Permits Equation

Dependent variable: Change in the log of MSA multifamily permits per household
Sample (adjusted): 1994Q3 to 2012Q4
Included observations: 74 after adjustments
Cross-sections included: 15
Total pool (balanced) observations: 1110
Convergence achieved after 5 iterations

R-squared	0.232
Adjusted R-squared	0.230
S.E. of regression	0.468
F-statistic	242.33
Durbin-Watson stat	2.23

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Change in log of U.S. multifamily permits per household, 4-qtr MA	1.0682	0.1548	6.9	0.0000
10-yr estimated multifamily mortgage rate less MSA urban consumer CPI inflation, major markets	-0.0413	0.0207	-2.0	0.0467
10-yr estimated multifamily mortgage rate less MSA urban consumer CPI inflation, non-major markets	-0.0771	0.0176	-4.4	0.0000
Autoregressive term	-0.4569	0.0266	-17.2	0.0000

Table 10: Pooled MSA Multifamily Housing Starts Equation

Dependent variable: Privately owned MSA housing starts per household

Sample (adjusted): 1982Q1 to 2012Q1

Included observations: 121 after adjustments

Cross-sections included: 15

Total pool (unbalanced) observations: 1437

R-squared	0.945
Adjusted R-squared	0.945
S.E. of regression	0.815
F-statistic	951.72
Durbin-Watson stat	1.78

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MSA multifamily housing permits per household	0.4899	0.0084	58.1	0.0000
MSA multifamily housing permits per household, lagged 1 qtr	0.3462	0.0084	41.3	0.0000
Change in MSA unemployment rate, ppt	-0.0619	0.0606	-1.0	0.3069

Table 11: Pooled MSA Multifamily Housing Completions Equation

Dependent variable: MSA new privately owned housing completions

Sample (adjusted): 1984Q1 to 2012Q1

Included observations: 110 after adjustments

Cross-sections included: 15

Total pool (balanced) observations: 1650

R-squared	0.958
Adjusted R-squared	0.958
S.E. of regression	1406.709
F-statistic	3.26E+09
Durbin-Watson stat	1.34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MSA multifamily housing starts, 4-qtr MA, major markets	0.4041	0.0138	29.2	0.0000
MSA multifamily housing starts, 4-qtr MA, non-major markets	0.5228	0.0146	35.8	0.0000
MSA multifamily housing starts, 4-qtr MA, lagged 4 qtrs, major markets	0.5106	0.0137	37.3	0.0000
MSA multifamily housing starts, 4-qtr MA, lagged 4 qtrs, non-major markets	0.4267	0.0128	33.3	0.0000

Endnotes

[i] This includes approximately $1.4 trillion in a fiscal stimulus, $200 billion in capital provided to Fannie Mae and Freddie Mac, and $200 billion in other costs including TARP.

[ii] Fannie Mae's evolution into a GSE began with the 1968 Charter Act and was completed by 1970.

[iii] Freddie Mac was created under the Emergency Home Finance Act of 1970.

[iv] Mortgage-backed securities are pools of mortgages used as collateral for securities sold in the secondary market. Ginnie Mae MBS are commonly referred to as "pass-through" certificates because the principal and interest of the underlying loans are passed through to investors. The interest rate of the security is lower than the interest rate of the underlying loan to allow for payment of servicing and guarantee fees.

[v] The definition of a subprime mortgage loan blurred as lending surged, but traditionally, a subprime loan has a FICO score of less than 620. An alt-A loan has a score of between 620 and 660. The average FICO score across all borrowers is approximately 700.

[vi] The private-label RMBS market accounted for an even greater 70% share of origination volume at the height of the housing bubble, with the FHA and GSEs accounting for only a 30% share.

[vii] A number of investment banks failed during the financial panic in part because they had invested in the riskiest tranches of the RMBS. They were attracted by the possibility of the high returns offered by these tranches but also needed to invest in them so they could construct the security and sell the remaining tranches to other investors.

[viii] The Basel III bank regulatory standards being formulated by global regulators rely much less on market-based forms of regulatory discipline.

[ix] The affordable housing goals also created a perverse outcome: Private lenders knew the GSEs would be desperate to purchase loans to meet their goals and extracted higher prices or other concessions such as the purchase of lower-quality loans.

[x] The Case-Shiller national house price index hit an all-time high in the first quarter of 2006. Two high-profile Bear Stearns hedge funds with investments in subprime and other mortgage-related securities failed dramatically in May 2007.

[xi] The enactment of the Housing and Economic Recovery Act of 2008 established the Federal Housing Finance Agency and gave it the authority to place Fannie Mae and Freddie Mac in conservatorship—a step it took in September 2008. The Treasury was granted authority to provide the GSEs with unlimited capital (by purchasing their stock) to maintain their solvency through 2012. Those actions gave the government control over the two institutions and effectively made its backing of their debt securities and MBS guarantees explicit.

[xii] The federal government took a large number of other steps to directly support the housing and mortgage markets, most notably the Federal Reserve's purchases of Fannie and Freddie debt and mortgage-backed securities, an increase in conforming loan limits, various efforts to facilitate mortgage loan modifications, including HAMP and HARP, and three rounds of tax credits to encourage homebuying.

[xiii] The bulk of the costs are related to the capital provided to Fannie and Freddie, which amounts to nearly $140 billion to date. For historical context, the cleanup of the savings and loan crisis in the late 1980s and early 1990s cost U.S. taxpayers an estimated $275 billion in today's dollars.

[xiv] J. Vernon Henderson and Yannis M. Ioannides, "A Model of Housing Tenure Choice," The American Economic Review (Vol. 73 No. 1, 1983).

[xv] Homeownership offers a tax benefit in addition to the mortgage interest deduction; imputed rent, or the value of housing services associated with living in a home is not taxed.

[xvi] Drew and Herbert, "Post-Recession Drivers of Preferences for Homeownership Working Paper W12-4."

[xvii] The delinquency rates are not entirely comparable but do illustrate the relatively worse deterioration in CMBS apartment loans. The Moody's DQT delinquency rate includes loans that are 60 days or more delinquent or are in foreclosure or REO. The MBA and Freddie Mac measures do not include homes in REO.

[xviii] This is the Moody's/RCA Commercial Property Price Index for apartments. Because the series starts in late 2000, the historical series is backcast to estimate a longer time series using a similar index published by NCREIF and a single-family house price.

[xix] The Census Bureau publishes computational formulas that it uses to compute completions. Rather than implement these formulas, we approximate them by using actual data to describe the process. For more information on these computations, see: http://www.census.gov/construction/nrc/lengthoftime.html

[xx] This term remains in the equation because the sign conforms to expectations as well as is consistent with that in the U.S. model equation. The primary market dummy variable was also tested but was found insignificant: The estimated coefficient for the secondary markets was slightly more negative than that for the primary markets, but neither coefficient was significant and they were not significantly different from each other.

[xxi] The S4 scenario is designed to have a one-in-25 probability of occurring.

About Moody's Analytics

Economic & Consumer Credit Analytics

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