An Analyst's Perspective on Historical Mortgage REIT Returns

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NYU Stern

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- *Caveats*: The mREIT industry has undergone several structural changes:
  - Kind of holdings: whole mortgages vs CMO/MBS
  - Kind of players: set up by banks in 60s/70s, REMICS after Act of 86
 - Macro-economic environment: monetary policy cycles, Great Inflation, Great Moderation, Great Recession

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- Not all mREITS are alike: agency resi vs. non-agency resi vs. commercial
- The past may not be the best indicator of the future

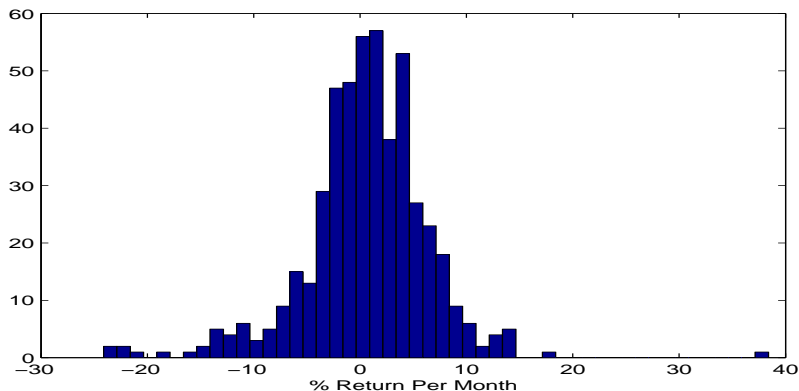# History of mREIT Returns: Jan 1972-Jan 2013
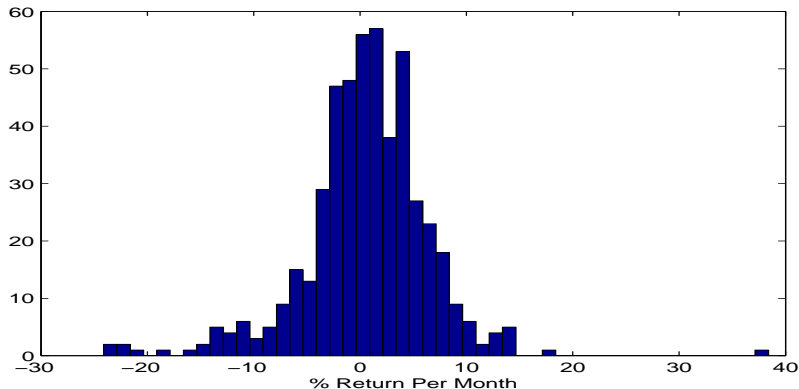
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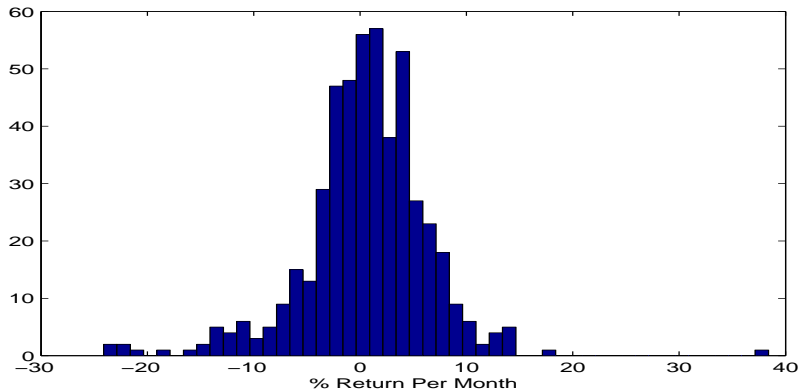
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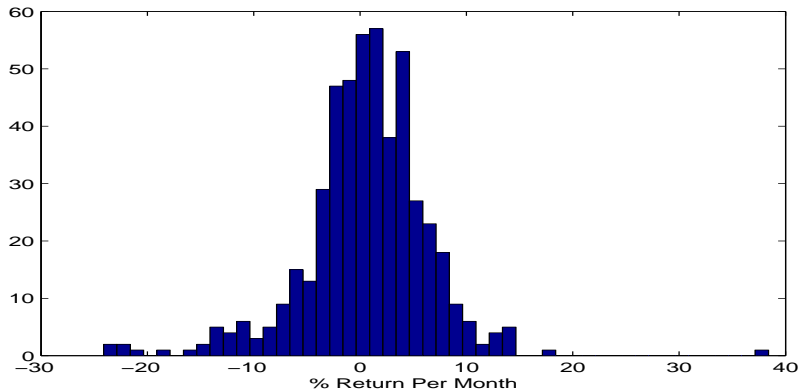
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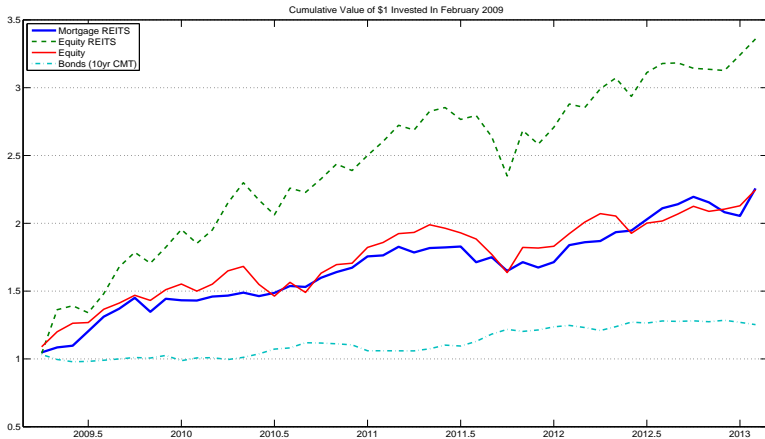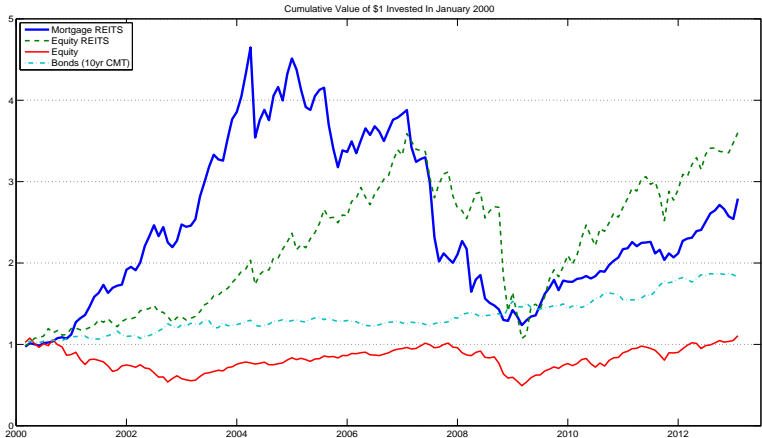
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- Volatility mREITS (market): 20.6% per year (16.1%)
- Skewness and kurtosis mREITS (market): -0.25(-0.53) and 8(5)

Cumulative Returns: After Financial Crisis

Cumulative Value of $1 Invested In February 2009

Legend:
- Mortgage REITS
- Equity REITS
- Equity
- Bonds (10yr CMT)

Cumulative Returns: Since January 2000

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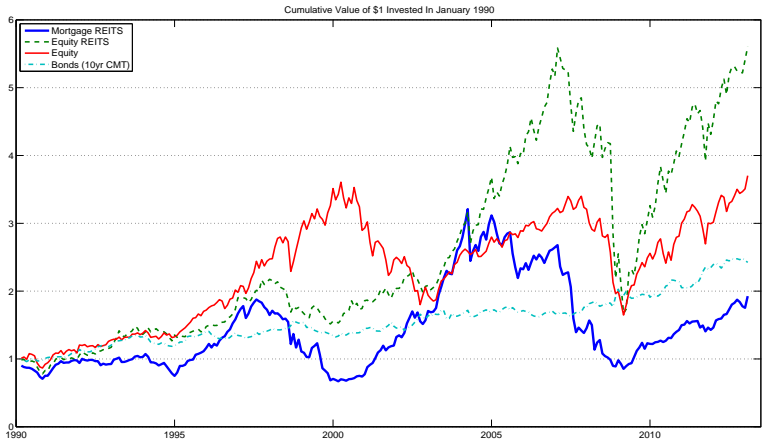
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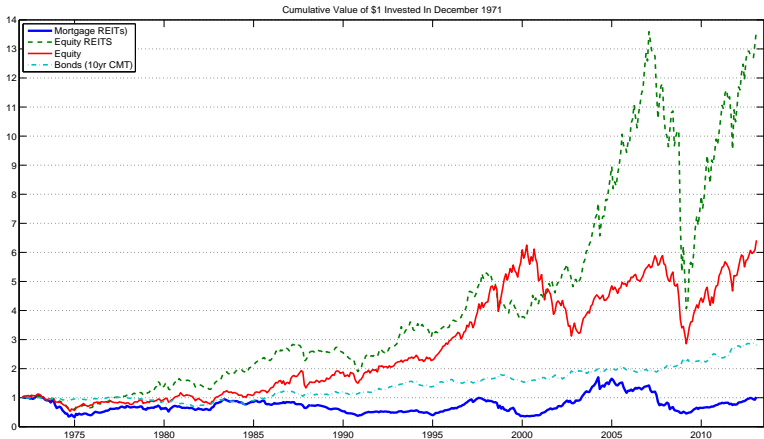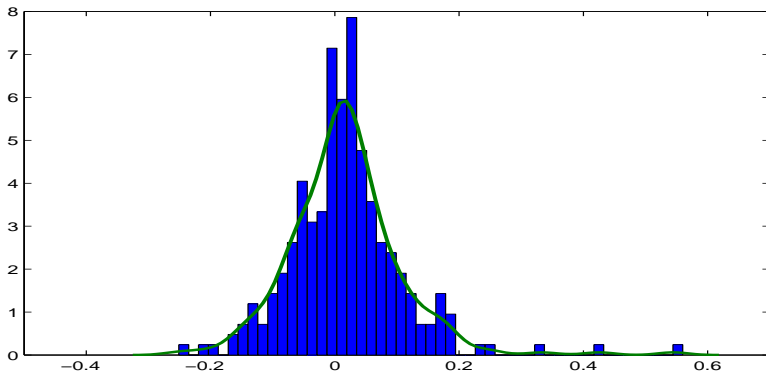
Cumulative Value of $1 Invested In December 1971

Legend:
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Breakdown of mREIT Returns: Agency (90-11)

- Average excess return agency MREITS: 16.3% per year
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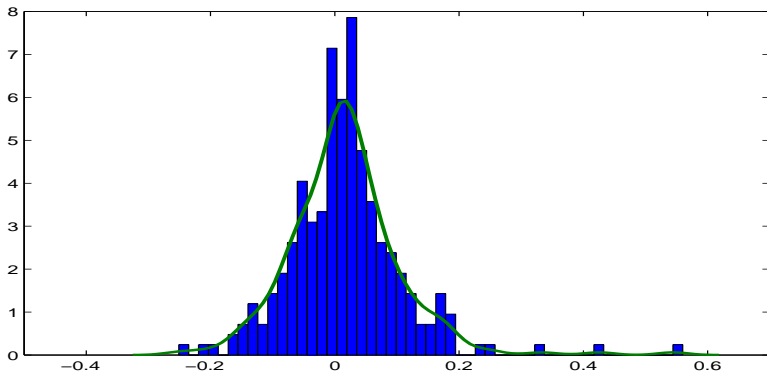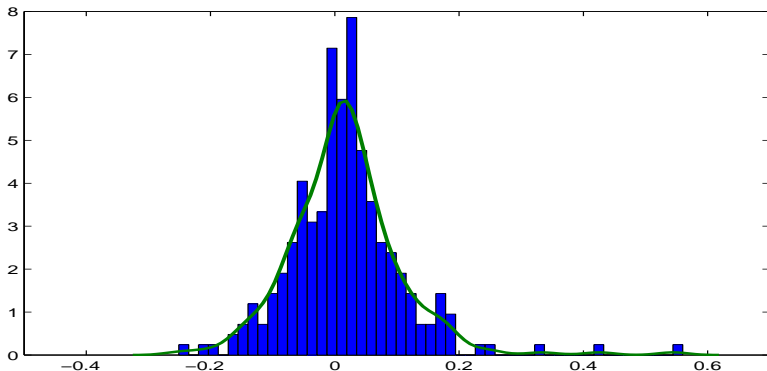- Volatility agency mREITS (market): 31.3% per year (15.6%)

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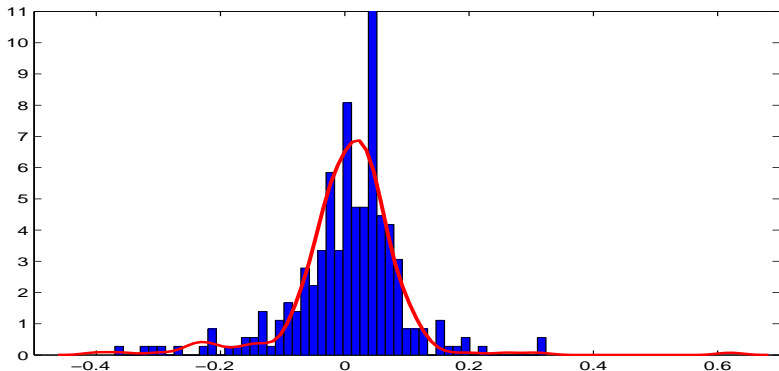

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- Average excess return stock market: 6.3% per year
- Volatility agency mREITS (market): 31.3% per year (15.6%)
- Skewness and kurtosis mREITS (market): 1.13(-0.62) and 8(4)

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- Volatility non-agency mREITS (market): 30.8% per year (15.6%)
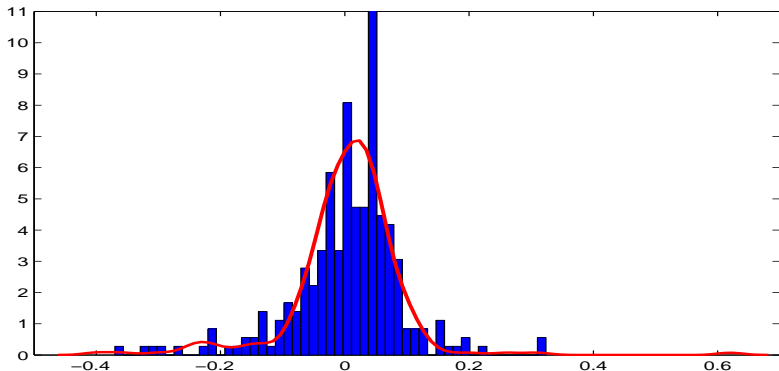
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- Skewness and kurtosis mREITS (market): -0.79(-0.62) and 6(4)

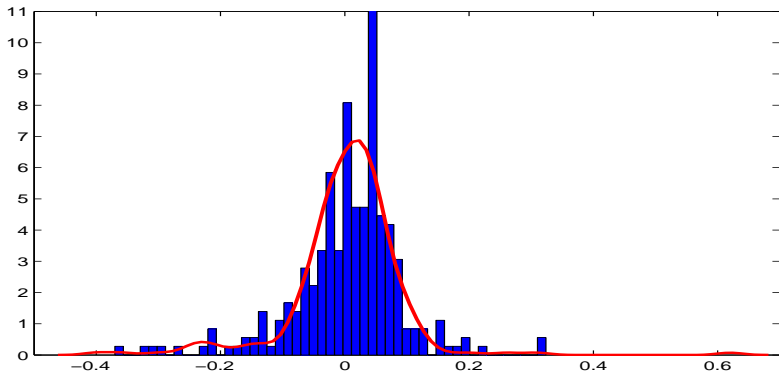# Breakdown of mREIT Returns: Commercial (90-11)

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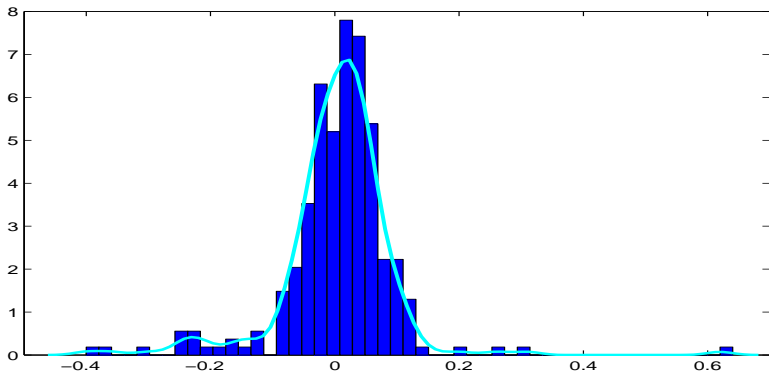
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- Average excess return stock market: 6.3% per year
- Volatility commercial mREITS (market): 31.1% per year (15.6%)

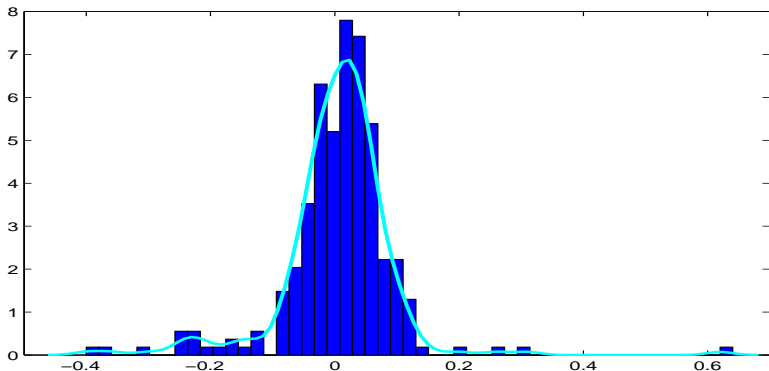# Breakdown of mREIT Returns: Commercial (90-11)
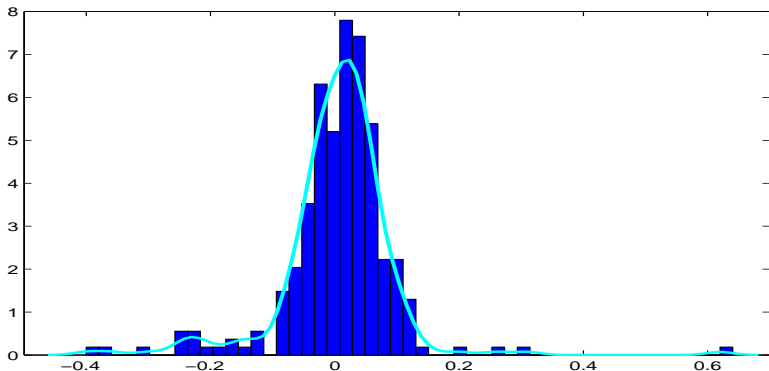
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Breakdown Cumulative Returns: Since January 2000
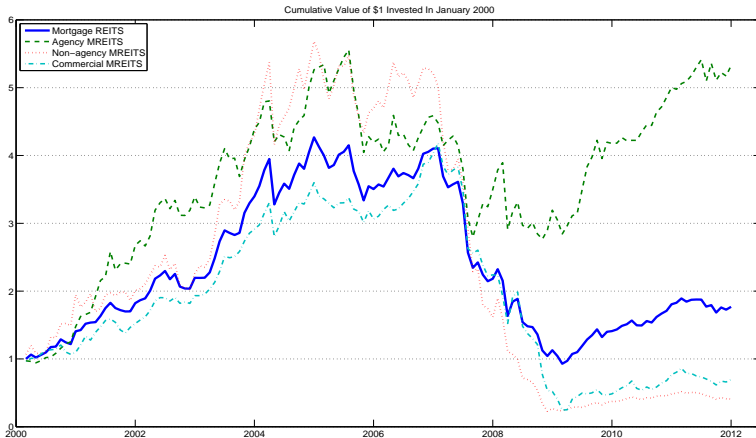
Cumulative Value of $1 Invested In January 2000

Legend:
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- Agency MREITS
- Non-agency MREITS
- Commercial MREITS

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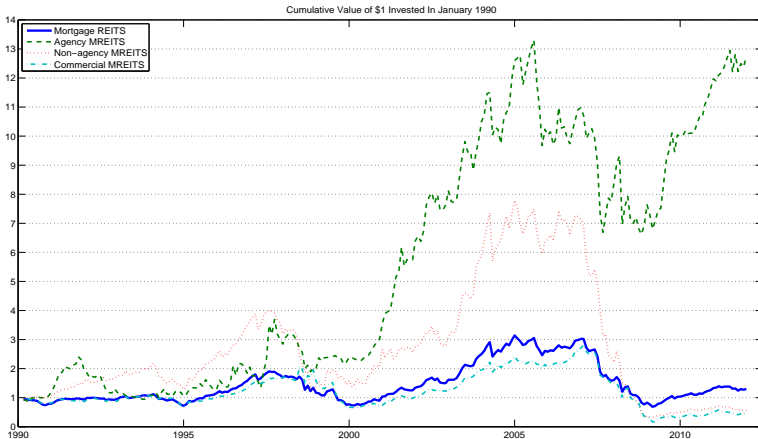
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- Approach 2: Bond return captures fluctuations in IOS

$$E[R^{mreit} - R^f] = \alpha_b + \beta_b E[R^{10yr} - R^f]$$

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- Approach 3: Market and bond returns capture fluctuations in IOS

$$E[R^{mreit} - R^f] = \alpha_{2f} + \beta_m E[R^{mkt} - R^f] + \beta_b E[R^{10yr} - R^f]$$

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- Approach 4: Market, size, and value factor returns capture fluctuations in IOS

$$E[R^{mreit} - R^f] = \alpha_{3f} + \beta_m E[R^{mkt} - R^f] + \beta_{smb} E[R^{smb}] + \beta_{hml} E[R^{hml}]$$

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- Approach 5: Market, bond, size, and value factor returns capture fluctuations in IOS

$$E[R^{mreit} - R^f] = \alpha_{4f} + \beta_m E[R^{mkt} - R^f] + \beta_b E[R^{10yr} - R^f] + \beta_{smb} E[R^{smb}] + \beta_{hml} E[R^{hml}]$$

Risk-adjusted Returns

Table: **Analyzing Mortgage REIT Performance 1972-2012**

	(1)	(2)	(3)	(4)	(5)
α	-1.61	0.25	-2.81	-5.84	**-7.41**
$R^{mkt} - R^f$	**0.62**	–	**0.60**	**0.67**	**0.63**
$R^{10yr} - R^f$	–	**0.60**	**0.47**	–	**0.57**
R^{smb}	–	–	–	**0.43**	**0.51**
R^{hml}	–	–	–	**0.61**	**0.61**
R^2	23.9	5.3	27.1	35.3	40.0

The dependent variable is the excess return on the NAREIT mortgage REIT index.
The independent variables are listed in the first column.

The sample is January 1972 until December 2012 or 492 months.

- *Interpretation*: A passive strategy that is a weighted average of the 4 factors (weights given in last column) has 63% correlation with mREIT returns but has a 7.4% higher return per year.

Breakdown Risk-adjusted Returns

Table: **Analyzing Mortgage REIT Performance 1990-2011**

	α_m	α_{2f}	α_{3f}	α_{4f}
All mREITS	1.13	-1.05	-1.61	-4.42
All Classified	0.87	-1.47	-2.61	-5.53
Agency Resi	**12.57**	**10.73**	**11.24**	8.76
Non-agency Resi	-2.29	-5.50	-7.07	**-11.12**
Commercial	-4.80	-4.50	**-10.53**	**-10.65**

The dependent variable is the excess return on our own mortgage REIT index and its components. The sample is January 1990 until December 2011 or 264 months.

- *Interpretation*: Agency resi has had positive abnormal returns, non-agency and commercial significantly negative ones.

Individual Firm mREITS

Table: **Analyzing Individual Firm mREIT Performance**

	α_m	α_{2f}	α_{3f}	α_{4f}	sample
Annaly Capital Management	**12.75**	9.82	**12.17**	8.74	9/97-12/11
Capstead Mortgage	9.53	4.43	9.09	2.32	8/85-12/11
Anworth Mortgage Asset	10.31	9.99	6.95	5.66	2/98-12/11
MFA Financial	8.29	7.46	5.47	3.78	3/98-12/11
Indymac Bancorp	-2.44	-6.87	-4.83	-10.32	8/85-7/08
Thornburg Mortgage	-15.84	-13.91	-18.95	-18.05	5/93-12/08
Redwood Trust	5.29	2.94	3.77	0.22	7/95-12/11
Dynex Capital	10.37	8.73	10.36	7.92	1/88-12/11
Istar Financial	14.61	10.38	13.46	8.12	10/89-11/11
RAIT Financial Trust	7.98	6.15	2.80	-0.97	12/97-12/11
Capital Trust	1.20	3.25	-3.78	-3.70	11/80-12/11

The dependent variable is the excess return on individual mortgage REITs. Companies are chosen to have at least 10 years of data.

Agency mREITs in Optimal Portfolio

- What is weight of Agency resi mREITs in a mean-variance efficient portfolio, using data from 1990-2011?

- 9%; portfolio has annual ret of 9.5% and Sharpe ratio of 1.4.
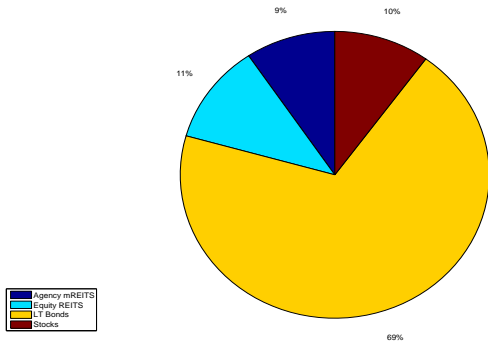
Summary

- Mortgage REITs as an asset class have had **low risk-adjusted returns** over past 20 and 40 years

- This under-performance is due to non-agency and commercial mREITs

- Agency mREITs delivered positive abnormal returns; returns outpacing the stock market and even equity REITS since 1990

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- Are there other risks in mREITs, historically and going forward?

Missing Relevant Risk Factors?

- Maybe previous analysis misses important risk factors that drive mREIT returns?

- Do *unexplained* returns from 4-factor model covary with other macro factors?

Table: **Analyzing Unexplained mREIT Returns**

| | All mREITs | | Agency mREITs |
Correlation with:	1971-2012	1990-2012	1990-2011
Economic Activity	−0.10	−0.15	−0.08
Recession	0.04	0.08	0.12
House Price Growth	0.04	0.06	0.00
Mortgage Basis	0.05	0.01	0.04
Corp. Credit Factor	0.04	0.05	−0.02
All	0.21	0.24	0.14

When Do Agency mREITs Crash?

- Look at 20% lowest abnormal Agency mREIT returns (53 mos). Agency mREIT (abnormal) returns are -9.5% (-10.7%) on average, or 1.25 standard deviations below average
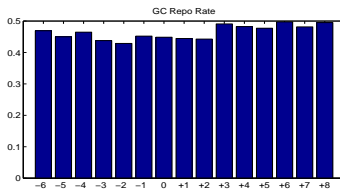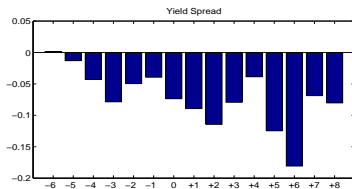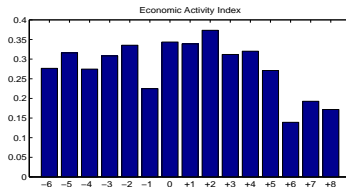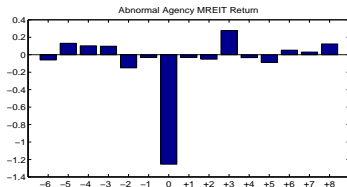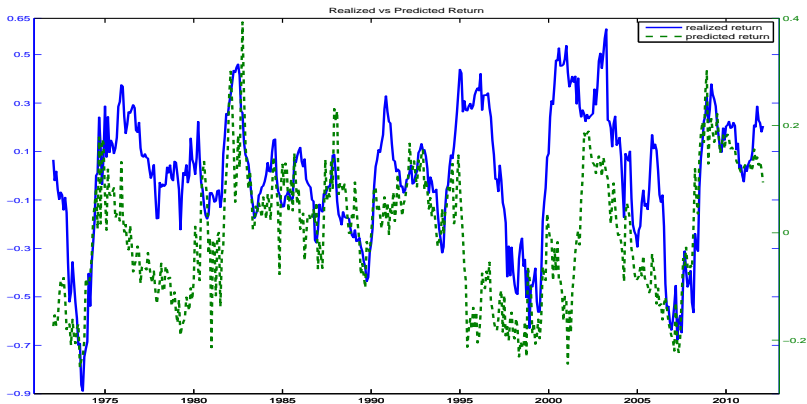
Predicting mREIT Returns

- Forecast twelve-month ahead mREIT index returns using:
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Realized vs Predicted Return
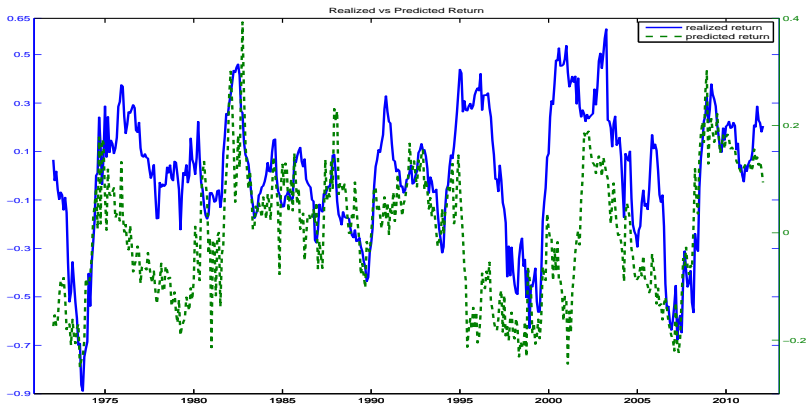
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- Forecast twelve-month ahead mREIT index returns using:
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- Actual and predicted return have 45% correlation

Recent Past/Near Future

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- Dividend yield: -14%; coeff. is 0.33, effect is -4.6%

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- Predicted mREIT return of 3.7% for 2013 is modest...

- ... but the possibility of an increasingly upward sloping term structure bodes well for future returns, especially if it coincides with increasing dividend yields

Concluding Thoughts

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- Interesting areas of research:
  - Identifying sources of out-performance of Agency mREITs as a whole
  - mREIT out-performance attribution to individual firms