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# **Rational Expectations in Housing Markets: The Case of Survey Forecasts**

Student Researcher – Lana Doronkina  
Faculty Advisor – James J. Forest



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# 1 – Introduction

- What is Rational Expectations Hypothesis (REH)?
- How is REH relevant to and applied in the U.S. housing market?



# What is Rational Expectations Hypothesis (REH)?

- REH was first introduced by the American economist John F. Muth.
- Foundational work: Rational Expectations and the Theory of Price Movements (1961).

How do individuals form expectations about the future? Based on:

- **All currently available information.**
- **Previous understanding of how the economy works.**
- **Individuals with both elements can make optimal, or “rational”, decisions.**

# Application of REH in Housing Markets

Used to understand the market's dynamic and predictive capabilities; utilized by:

- Policymakers
- Economists
- Financial analysts

Influential researchers:

- Engle, Granger, and Yoo – methodology.
- Schirm and Zarnowitz
- Hendry and Shiller – criticisms and extension.



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## 2 – Data

- Which economic indicators comprehensively measure housing market expectations?
- What are our observed data periods and what sources did we use?



# Data Collection Techniques



## Macroeconomic Indicators

Supply side:

- Building Permits
- Construction Spending
- Housing Starts

Demand side:

- Existing Home Sales
- New Home Sales



## Data Samples and Sources

Samples:

- Pre-peak : Start – 2/2006
- Post-peak: 3/2006 – End

Sources:

- MMS
- Action Economics
- Briefing
- Investing

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# 3 – Methodology

Testing the forecast and actual series of each indicator for:

- Stationarity at level and in 1<sup>st</sup> difference.
- Cointegration of order 1.
- Unbiasedness – minimal bias.
- Anchoring bias – anchor to initial information.





# Methodology Testing Methods

Testing For:	Descriptions:	Test Names:
Stationarity	Tests forecast and actual series for the presence of a unit root.	ADF, KPSS
Cointegration	Tests non-stationary series for a long-term equilibrium relationship.	EY, DOLS
Unbiasedness	Tests forecast unbiasedness by regressing actuals on forecasts.	MZ Regression
Anchoring Bias	Tests if forecasts are anchored to past values rather than fully adjusting to new information.	Wald Test

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# 4 – Empirical Results

- Evaluating each housing market macroeconomic indicator based on our methodology tests.
- Do their results align with REH?



# Stationarity and Cointegration

Stationary at level:

- Construction Spending

Stationary in 1<sup>st</sup> difference:

- Building Permits
- Housing Starts
- Existing Home Sales
- New Home Sales

More indicators are stationary at level in the post-peak sample.

DOLS adjustment for dynamic effects is better-suited to the data.

Cointegration of order 1:

- Building Permits
- Housing Starts
- New Home Sales
- Existing Home Sales (post-peak)

Any deviation from the long-term equilibrium is quickly corrected.

# Unbiasedness and Anchoring Bias

Forecast Bias ( $\beta_0 = 0$ ):

- Building Permits – No.
- Construction Spending – Yes.
- Housing Starts – Mixed.
- Existing Home Sales – No.
- New Home Sales – Mixed.

Forecast Efficiency ( $\beta_1 = 1$ ):

- Building Permits – Yes.
- Construction Spending – No.
- Housing Starts – Yes.
- Existing Home Sales – Mixed.
- New Home Sales – Yes.

All of the indicators display signs of anchoring bias from their Wald test coefficients, however, they are rarely statistically significant.

- Construction Spending – highly significant anchoring bias in both samples.
- Housing Starts – significant anchoring bias in the pre-peak sample.

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# 5 – Implications and Conclusion

- What does forecast rationality and irrationality mean for researchers and policymakers?
- What does it mean for consumers?



# What does this all really mean?



## Housing Market

The U.S. housing market indicators largely align with REH on the grounds of long-term equilibrium relationships and forecast efficiency, less so on bias.



## Policymakers & Research

Important to refine forecasting techniques and address behavioral anomalies to enhance the predictive capabilities of these models.



## Consumers & Investors

Check the accuracy of market forecasts, paying special attention to potential psychological biases that could greatly distort reality.

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# Thank You!

Any questions?

