

Hedging Housing Risk with Stocks from Local Employers

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How to Hedge Local Housing Risk?

- Use traded securities that correlate negatively with housing
 - Traded Stocks: Local vs National
 - Case-Shiller Futures
- Can rent if volatility is high and plan on moving earlier
 - Only useful if owners live in other markets
 - Preference for owning in the US (~70%)
- Put down less money, take equity out on house

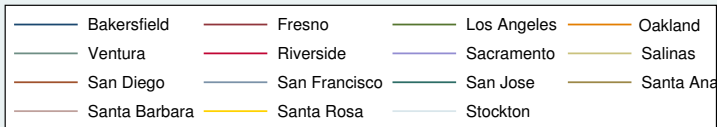
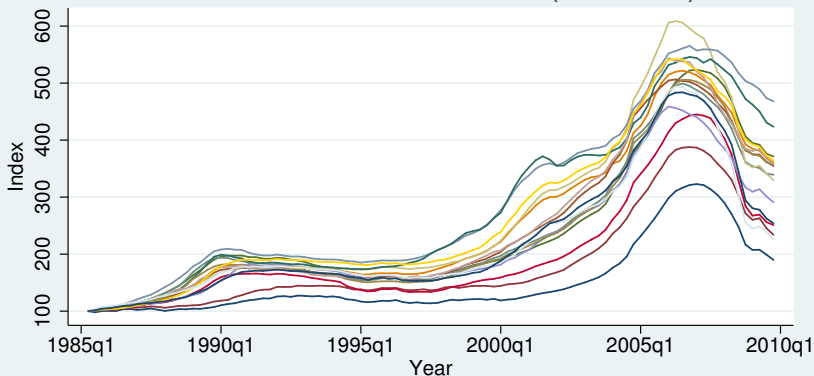
Questions

- 1 How much of housing variance can be hedged with national vs local stocks?
 - What is the relation between the stock returns of local companies and local housing returns?
- 2 How does information flow from the stock market to the housing market?
 - What theoretical model gives rise to observed correlations

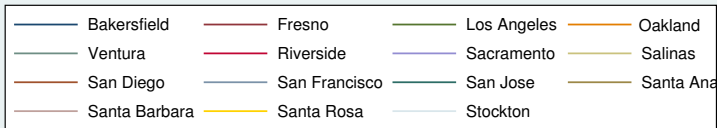
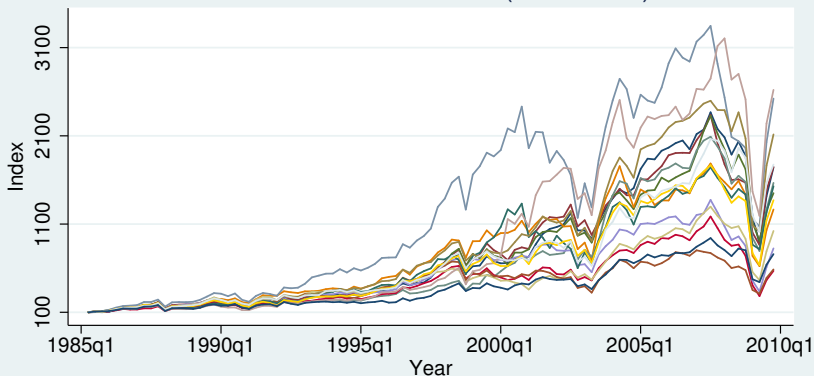
Data

- House price data: Dataquick
- National Establishment Time-Series Database
 - Annual XY coordinates of all firms, and employment data
- Local stock price index
 - Top 20 largest local employers
 - Stock Return data from CRSP 1985-2009

The FHFA House Price Index (1985=100)



The Local Stock Index (1985=100)



Why Should There Be a Correlation?

- N islands where workers live and firms produce:

$$F_t = A_t f(K_t, L_t)$$

- Wages are set competitively:

$$W_t = A_t \partial f(L_t, K_t) / \partial L_t$$

- The price of stock of local firm is a function of its productivity:

$$P_t = E_t \sum_{j=t+1}^{\infty} m_j [A_j f(K_j, L_j) - W_t L_t]$$

- House prices are a function of local wages:

$$H_t = E_t \sum_{j=t+1}^{\infty} m_j A_j \partial f(L_j, K_j) / \partial L_j$$

Hedging Housing Returns with Aggregate Indexes

	(1)	(2)	(3)
<i>REIT</i>	.0811 (.0662)		.0738 (.0649)
<i>MKT - rf</i>		-.00885 (.157)	-.0185 (.138)
<i>SMB</i>		-.0583 (.140)	-.0665 (.135)
<i>HML</i>		.121 (0.117)	.0822 (0.124)
MSA	16	16	16
<i>N</i>	384	384	384
<i>R</i> ²	0.053	0.031	0.072

Correlations Between Housing and Local Stock Index

MSA	Correlation
Bakersfield	.52
Fresno	.41
Los Angeles-Long Beach-Glendale	.32
Oakland-Fremont-Hayward	.17
Oxnard-Thousand Oaks-Ventura,	.44
Oxnard-Thousand Oaks-Ventura	.51
Sacramento-Arden-Arcade-Roseville	.29
Salinas	.37
San Diego-Carlsbad-San Marcos	.23
San Francisco-San Mateo-Redwood City	.21
San Jose-Sunnyvale-Santa Clara	.16
Santa Ana-Anaheim-Irvine	.31
Santa Barbara-Santa Maria-Goleta	.20
Santa Rosa-Petaluma	.26
Stockton	.35
Vallejo-Fairfield	.39

Statistical Model

- Micro level spatial correlations
 - Construct house specific price index by Locally Weighted Repeat Sales
 - Use spatial diffusion model to estimate correlations with local firms
- Construct mean-variance optimal portfolios for each house
- For some level of risk aversion, show aggregate hedging benefits for the whole market

Predicting Housing Returns with Lagged Returns

	(1)	(2)	(3)
$LSret(t)$	.118*	.148**	.0838**
	(.0637)	(.0524)	(.0266)
$LSret(t - 1)$		.169**	.0967**
		(.0661)	(.0432)
$LSret(t - 2)$		0.105**	.0315
		(.0468)	(.0391)
$Hret(t - 1)$			.708**
			(.114)
MSA	16	16	16
N	384	352	352
R^2	0.096	0.252	0.567

Do Housing Returns Affect Stock Returns?

	(1)	(2)	(3)
$Hret(t)$	.816*	.760	.980
	(.472)	(.538)	(.595)
$Hret(t - 1)$		.139	.0604
		(.609)	(.633)
$Hret(t - 2)$		-.290	-.294
		(.537)	(.544)
$LSret(t - 1)$			-.266
			(.230)
MSAs	16	16	16
N	384	352	352
R^2	0.096	0.102	0.154

Quarterly Regressions of Housing on Stock Returns

	(1)	(2)	(3)
$LSret(t)$	-.0002	.0159	-.0206**
$LSret(t - 1)$		.0288*	.0125
$LSret(t - 2)$		.0674**	.0265**
$LSret(t - 3)$		.0515**	-.0029
$Hret(t - 1)$			0.830**
N	1568	1520	1520
R^2	0.000	0.104	0.705

How to explain these findings?

- A rational expectations model could not give rise to such patterns
 - What kind of friction would we need?
- Is there evidence of a spatial information story?
 - Does the effect of lagged shocks spread slowly over space?