

The Composition of Hedonic Pricing Models

G. Stacy Sirmans, David A. Macpherson and Emily N. Zietz

報告人：陳力綸

大綱

- 早期特徵價格法之發展
- 成交價與等待時間
- 相關研究之文獻回顧

Introduction(1/3)

- 住宅是由許多隱含特徵所組成，而這些特徵是決定住宅價格的重要因素。
- 這些特徵可能是住宅面積、區位和樓層等等。
- 影響住宅價格的重要特徵會因不同住宅、地域，甚至買者而不同。

這證明了住宅並非同質性產品的特性。
而特性使得住宅的估價難度提高。

Introduction(2/3)

- 特徵價格法(Hedonic Regression Analysis)就是用來評測這些特徵對價格的邊際影響。
- 特徵價格法有下列限制：
 - 影響房價的重要特徵會隨地區而不同，所以通常只能針對某一細部的地區或市場來做研究。
 - 各研究者對特徵的認定有所不同。
 - 個特徵的隱含價格難以觀察。

Introduction(3/3)

- 特徵價格方程式：

$$\text{Price} = f(\text{Physical Characteristics, Other Factors})$$

面積、衛浴數、屋
齡、區位

學校等級、外
部性

The Theoretical Development of Hedonic Pricing Models

- 異質性財貨和消費者特性
- 變數的選擇
 - 先驗(ad hoc)
 - 共線性(correlation)
- 半對數模型(semi-log)

The Early History of Hedonic Models

- 二階段模型
 - 成交價(selling price)與等待期間(time-on-the-market)
 - 通常而言二者呈反向關係
 - 但受到其他因素影響，eg.流通性、市場狀況、仲介公司的規模、搜尋成本等
 - 甚至在某些研究中有相反的結果
 - 故現在的模型中較少放置等待期間為變數

Review of Recent Hedonic Pricing Model Studies(1/3)

- Top 20 變數

Exhibit 1
The Twenty Characteristics Appearing Most Often in Hedonic Pricing Model Studies

Variable*	Appearances	# Times Positive	# Times Negative	# Times Not Significant
Lot Size	52	45	0	7
Ln Lot Size	12	9	0	3
Square Feet	69	62	4	3
Ln Square Feet	12	12	0	0
Brick	13	9	0	4
Age	78	7	63	8
# Stories	13	4	7	2
# Of Bathrooms	40	34	1	5
# Rooms	14	10	1	3
Bedrooms	40	21	9	10
Full Baths	37	31	1	5
Fireplace	57	43	3	11
Air-Conditioning	37	34	1	2
Basement	21	15	1	5
Garage Spaces	61	48	0	13
Deck	12	10	0	2
Pool	31	27	0	4
Distance	15	5	5	5
Time On Market	18	1	8	9
Time Trend	13	2	3	8

Note: Although some of these variables are the same and just measured differently, they are presented separately so readers can see how they are typically measured.

Review of Recent Hedonic Pricing Model Studies(2/3)

• Top 5
變數
(by 種類)

Exhibit 2
The Top Five Characteristics by Category from Hedonic Pricing Model Studies

Category	Variable	Appearances	# Times Positive	# Times Negative	# Times Not Significant
1	Construction & Structure				
	Lot size	52	45	0	7
	Sq ft	69	62	4	3
	Age	78	7	63	8
	# of bathrooms	40	34	1	5
2	Bedrooms	40	21	9	10
	House Internal Features				
	Full baths	37	31	1	5
	Half baths	7	6	0	1
	Fireplace	57	43	3	11
	Air-conditioning	37	34	1	2
3	Hardwood floors	7	5	0	2
	Basement	21	15	1	5
	House External Amenities				
	Garage spaces	61	48	0	13
	Deck	12	10	0	2
	Pool	31	27	0	4
	Porch	9	5	0	4
4	Carport	4	1	1	2
	Garage	4	3	0	1
	Environmental—Natural				
	Lake view	5	5	0	0
5	Lake front	5	5	0	0
	Oceanview	4	4	0	0
	"Good view"	4	3	0	1
	Environmental—Neighborhood & Location				
Location	9	7	2	0	
Crime	7	1	4	2	
Distance	15	5	5	5	
Golf course	9	9	0	0	
Trees	6	6	0	0	

Review of Recent Hedonic Pricing Model Studies(3/3)

• Top 5
變數
(by 種類)

Exhibit 2 (continued)
The Top Five Characteristics by Category from Hedonic Pricing Model Studies

Category	Variable	Appearances	# Times Positive	# Times Negative	# Times Not Significant
6	Environmental-Public Service				
	School district	10	3	7	0
	% School district minority	7	0	5	2
	Public sewer	2	1	1	0
7	Marketing, Occupancy & Selling Factors				
	Assessors quality	6	5	0	1
	Assessed condition	8	7	0	1
	Vacant	10	0	9	1
	Owner-occupied	6	4	0	2
	Time on market	18	1	8	9
	Trend	13	2	3	8
8	Financial Issues				
	FHA Fin	3	0	3	0
	VA Fin	3	0	3	0
	Foreclosure	5	0	5	0
	Favorable financing	3	0	0	3
Property tax	3	0	1	2	

Comparing Coefficient Estimates by Geographical Area(1/2)

Exhibit 4
Coefficient Estimates from Hedonic Pricing Models for Selected Characteristics by Geographical Area

Region	Square Feet	Lot Size	Age	Bathrooms	Bedrooms	Fireplace	AC	TOM	Basement	Pool	Garage Spaces	School District
Northeast	x	0.0000132	-0.00294	0.127	0.157	0.143	0.048	0.00	x	0.037	0.070	
		-0.004	0.13	0.06		0.040	0.0		0.058		0.230	
			-0.010			0.033	0.070	0.00		0.056	0.113	
							0.090	0.099			0.060	
							0.090				0.113	
						0.050				0.079		
						0.131				0.121		
Southeast	0.00035	0.0000021	-0.009	0.099	x	0.127	0.129	-0.0002	1.120	0.098	0.063	-0.128
	0.00042	0.0000029	-0.005			0.133	0.101	-0.0001		0.090	0.070	-0.086
	0.00040		-0.012			0.067		-0.0220		0.048	0.067	
	0.00070		-0.019			0.145		-0.0002		0.077	0.055	
	0.00040					0.037		-0.0003			0.100	
										0.143		
Midwest	0.00015	0.0000044	-0.017	x	x	0.078	0.129	0.00	0.158	0.060	0.106	-0.030
	0.00040	0.0000070				0.110	0.099		0.120	0.059	0.120	
						0.085	0.060		0.121		0.096	
						0.078	0.075		0.050		0.106	
						0.045	0.070				0.036	
						0.129						
Southwest	0.00040	0.0000070	-0.012	0.161	0.022	0.128	0.16	-0.0003	x	0.134	0.072	x
	0.00060	0.00020	-0.015	0.015	0.035	0.067	0.15			0.104	0.057	
	0.00040		-0.0002	0.044	0.31	0.120	0.26			0.128	0.074	
	0.00070		-0.008	0.18		0.146				0.097	0.107	
						0.011				0.093		
									0.083			
									0.104			

Comparing Coefficient Estimates by Geographical Area(2/2)

Exhibit 4 (continued)
Coefficient Estimates from Hedonic Pricing Models for Selected Characteristics by Geographical Area

Region	Square Feet	Lot Size	Age	Bathrooms	Bedrooms	Fireplace	AC	TOM	Basement	Pool	Garage Spaces	School District
West	0.00050	0.000017	-0.006	x	x	0.054	0.007	x	0.143	0.134	0.045	0.054
	0.00060	0.00001	-0.003			0.106	0.048		0.059	0.046	0.024	-0.184
	0.00030	0.0000014	-0.020			0.053				0.058	0.039	0.148
	0.00040		-0.0032			0.024				0.090	0.014	-0.020
										0.085	0.025	
											0.051	
											0.170	
											0.080	
											0.138	
Coeff.*	0.0003	0.015 (in acres)	-0.050 (binary variables for age)	0.216 (full baths) 0.139 (half baths)	0.041	0.113	0.117	-0.015	-0.087	0.076 (inground pool)	0.121	x

Note:
 *Estimates from Sirmans and Macpherson (2003).

Conclusions

- 成交價和等待時間的關係界定困難
- 常用變數的認定與討論