



Spillovers in Asset Prices: The Curious Case of Haunted Houses

Utpal Bhattacharya, HKUST

Daisy Huang, Nanjing Audit University

Kasper Meisner Nielsen, HKUST

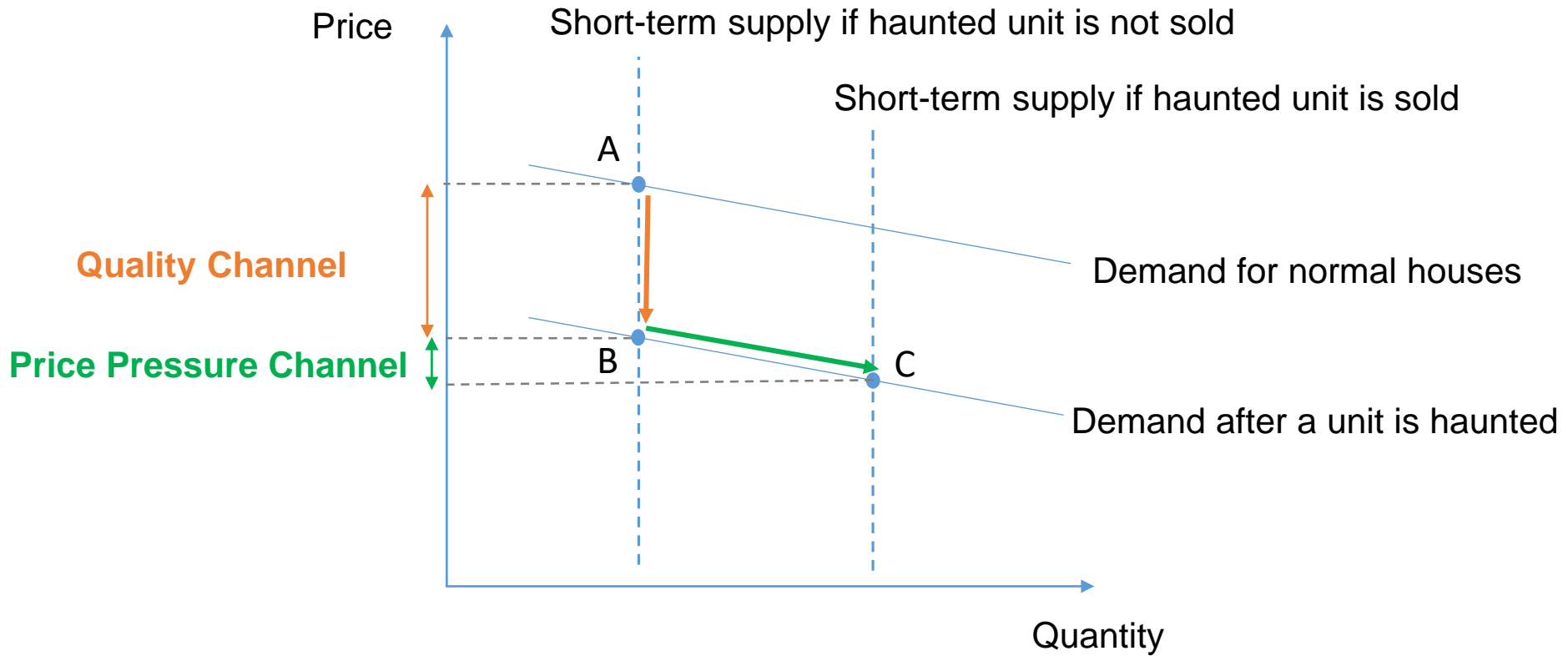
Research Question

1. When a house becomes haunted, does its price drop? If yes, by how much?
2. Does the haunted house affect the price of neighboring houses? If yes, by how much?
3. If there is a negative spillover effect, why does that happen? Fire sales? Or something else?

Motivation

- The global financial crisis of 2008 has reignited an interest in spillovers
 - Downward spirals or cascades in asset prices and net worth of market participants
- Two issues:
 1. Challenging to identifying spillover effects while completely ruling out underlying economic supply or demand shocks
 2. Prior studies have shown that fire sales lead to lower asset prices and negative spillover effects on prices of similar assets
 - Spillovers are driven by price pressure
 - ... or, as we argue in this paper, also because of a change in the perceived quality of the asset

Price Pressure vs. Quality Channel



Institutional Setting: Why Hong Kong?

1. Hong Kong's population of 7.3 million lives in a small area that is less than 25% of its 1,106 km² land
 - Residential real estate mainly consists of units in high rise apartment blocks sharing common facilities inside an estate
 - Market consists of many estates, but apartments inside each estate are fairly homogeneous

Why Hong Kong? Dawning Views



Why Hong Kong? Dawning Views



Institutional Setting: Why Hong Kong?

- Hong Kong residents are wary of haunted houses and sellers have to disclose whether a house is haunted

The screenshot shows the Spacious website interface for Hong Kong real estate. The 'HAUNTED' filter is selected, and a tooltip is displayed over a property listing at 3 Tai Koo Shing Road, Tai Koo Shing, Hong Kong. The tooltip contains the following text:

- Former news anchor committed suicide by jumping off building.
- A 61-year-old man with emotional problem jumped off the building.
- A man in his 80s jumped off the building due to sickness.
- Male jumped off the building due to health problem.
- Female with depression first strangled her 10 years old son and hanged herself after she found out her husband's affair.

Institutional Setting: Why Hong Kong?

3. Statistical power: Liquid market & lots of tragic events

The screenshot shows the website squarefoot.com.hk/haunted. The page features a search bar with filters for Year and District, and a table listing various tragic events. The table has columns for Date, District, Address, Building, and Case. The cases include incidents such as a woman jumping from a window, a woman falling from an apartment, a man falling from heights, a woman hanging herself, a man committing charcoal suicide, a woman being stabbed, a man hanging himself at home, and a woman falling from heights.

Date	District	Address	Building	Case
2017-01-06	Aberdeen	South Horizons	Mei Chun Court	56-year-old woman jumped from living room window and died on the scene
2017-01-05	Shek Kip Mei		Pak Tin Estate Block 9	66-year-old woman fell from apartment unit and was pronounced dead upon arrival at hospital
2017-01-05	Kwun Tong	Tsui Ping North Estate	Tsui Nam House	Man fell from heights and confirmed dead upon arrival at hospital
2017-01-04	Tin Shui Wai	Tin Tsz Estate	Tsz Sum House	54-year-old man fell from apartment unit and died on the scene
2017-01-03	Yuen Long		83 Tai Tseng Wai	A woman hanged herself and was pronounced dead upon arrival at hospital
2017-01-03	Tai Po		Kingsland	74-year-old man hanged himself with dog leash inside glasshouse on rooftop
2017-01-02	Mong Kok		Kwong Wing Building	53-year-old woman hanged herself with rope and was pronounced dead upon arrival at hospital
2016-12-31	Tai Po		Ting Kok Tseun	46-year-old man committed charcoal suicide in bedroom and confirmed dead
2016-12-30	Tuen Mun	Affluence Garden	Civic House	52-year-old woman was stabbed by husband with scissors during quarrel and was pronounced dead upon arrival at hospital
2016-12-30	Ma On Shan		Saddle Ridge Garden Block 11	80-year-old man hanged himself at home and body was found by helper
2016-12-29	Sha Tin	Sun Chui Estate	Sun Hok House	90-year-old man hanged himself at home and was confirmed died
2016-12-29	Tai Kok Tsui	Hoi Fu Court	Hoi Ning House	46-year-old woman fell from heights and died
2016-12-29	Kwun		Cha Kwo	Burnt body of 56-year-old woman

Institutional Setting: Why Hong Kong?

4. Close proximity of units makes it unlikely that local market conditions differentially affect haunted and non-haunted units / floors / blocks

Data on HK Residential Real Estate

- All private residential real estate transactions in Hong Kong between 2000 and 2015
- Data include
 - Estate name and location
 - Property characteristics (size, age)
 - Transaction date and price
- We harvest data on haunted houses from 4 real estate websites
 - HK Compass; Property HK; Spacious; Squarefoot
- We focus on the 214 most liquid estates with more than 1,000 transactions (~65 per year) during our sample period
 - Corresponds to 50% of all private residential real estate transactions during our sample period

Descriptive Statistics (1)

Table 1, Descriptive statistics

	All	Liquid estate		Difference (1)-(2)
		Yes (1)	No (2)	
A. Transaction characteristics				
Price (million HKD)	4.22	3.88	4.67	0.75***
Size (square feet)	594.3	589.0	603.5	-12.6***
Price per square feet (HKD)	6,393.2	6,094.3	6,916.9	-772.3***
Block age (years)	15.2	10.4	21.6	-11.1***
B. Territory (%)				
Hong Kong Island	23.0	11.9	37.6	
Kowloon	28.6	23.3	35.6	
New Territories	48.4	64.8	26.8	
N	1,124,348	646,669	477,679	

Descriptive Statistics (2)

Table 2, Sample of haunted houses

	N	%
A. Cause of deaths		
Murder	21	2.3%
Suicide	656	73.1%
- Hanging	74	8.2%
- Jump to death	427	47.6%
- Other suicides	155	17.3%
Other	221	24.7%
N	898	100%

Effect of Haunted Houses on Prices

Window	Unit			Floor			Block		
	Price per square feet		%	Price per square feet		%	Price per square feet		%
	Haunted	District	Difference	Haunted	District	Difference	Haunted	District	Difference
A. One year before to one year after									
Before	4,162	4,013	-4%	4,168	4,648	12%	4,452	4,644	4%
After	4,725	5,490	16%	4,036	4,738	17%	4,600	4,839	5%
Difference	14%	37%	-23%	-3%	2%	-5%	3%	4%	-1%
B. Two years before to two years after									
Before	4,257	3,955	-7%	4,078	4,540	11%	4,388	4,582	4%
After	4,605	5,407	17%	4,069	4,787	18%	4,590	4,819	5%
Difference	8%	37%	-29%	0%	5%	-6%	5%	5%	-1%
C. Three years before to three years after									
Before	4,808	4,167	-13%	4,106	4,546	11%	4,338	4,517	4%
After	4,213	4,930	17%	3,989	4,711	18%	4,587	4,828	5%
Difference	-18%	18%	-31%	-3%	4%	-6%	6%	7%	-1%

Empirical Specification

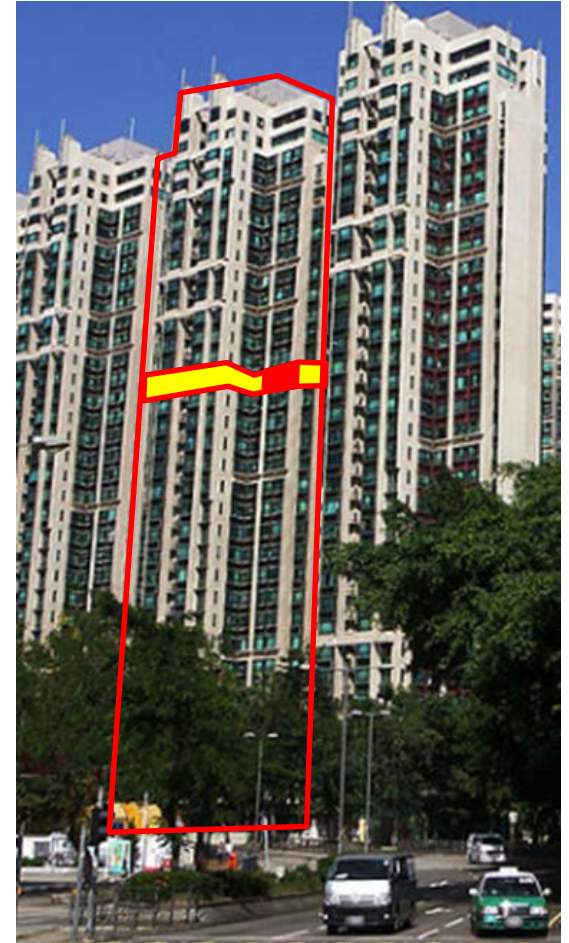
- Estimating equation:

$$y_{it} = \alpha_i + \beta_t + \gamma'X_i + \theta H_{it-k} + \epsilon_{it},$$

- Dependent variable:
 - Log. price, y_{it} , of apartment i in year t
- Parameters:
 - α_i represents apartment fixed-effects
 - β_t represents year-month fixed-effects
 - X_t is a vector of apartment characteristics
 - H_{it-k} is an indicator for a haunted house due to an unnatural death occurring in the last k years before t

Empirical Specification

- H_{it-k} is an indicator for a haunted house due to an unnatural death occurring in the last k years
 - Unit ■
 - Floor ■
 - Block □
 - ...
 - Estate
- To avoid spurious correlation we exclude:
 - Affected unit when we estimate the effect on prices of the affected floor
 - Affected floor when we estimate the effect on prices of the affected block
 - Affected block when we estimate the effect on prices of the affected estate



Spillover Effects of Haunted Houses

Table 4. Spillover effects of haunted houses on price

	Unit (1)
Haunted house	-0.1970*** (0.049)
Size	0.0016*** (0.0001)
Age	-0.0116*** (0.0004)
Unit fixed-effects	Yes
Year-month fixed effects	Yes
Adj. R-squared	0.988
N	151,237

Spillover Effects of Haunted Houses



Other Results: Strongest spillover for murder

Table 6, Cause of death and spillover effects

	All	Cause of death				
	(1)	Murder (2)	Jump to death (3)	Hanging (4)	Other suicides (5)	Unclassified (6)
Unit	-0.2000*** (0.0309)	-0.3625*** (0.1194)	-0.1646*** (0.0477)	-0.2777*** (0.0852)	-0.2191*** (0.0404)	-0.1992*** (0.0318)
Floor	-0.0466*** (0.0069)	-0.1776*** (0.0388)	-0.0435*** (0.0089)	-0.1136*** (0.0374)	-0.0806*** (0.0133)	-0.0442*** (0.0069)
Block	-0.0405*** (0.0011)	-0.0480*** (0.0061)	-0.0363*** (-0.0014)	-0.1093*** (0.0031)	-0.0771*** (0.0020)	-0.0401*** (0.0011)
Estate	-0.0317*** (0.0010)	-0.0725*** (0.0023)	-0.0080*** (0.0010)	-0.0511*** (0.0014)	-0.0055*** (0.0012)	-0.0307*** (0.0010)
N of deaths	898	21	427	74	155	221

Other Results: Price recovery is slow

Table 5. Decay in spillover effects

	Unit (1)	Floor (2)	Block (3)	Estate (4)
Haunted house	-0.1626*** (0.0539)	-0.0728*** (0.0015)	-0.0557*** (0.0016)	-0.0296*** (0.0010)
Haunted house * Time	-0.0045 (0.0054)	0.0032*** (0.0011)	0.0023*** (0.0002)	0.0028*** (0.0001)
Size	0.0016*** (0.0001)	0.0014*** (0.0001)	0.0014*** (0.0001)	0.0014*** (0.0001)
Age	-0.0116*** (0.0004)	-0.0171*** (0.0004)	-0.0166*** (0.0003)	-0.0190*** (0.0003)
Unit fixed-effects	Yes	Yes	Yes	Yes
Year-month fixed effects	Yes	Yes	Yes	Yes
Adj. R-squared	0.988	0.976	0.976	0.975
N	151,237	323,586	324,025	199,516

Price Pressure vs. Quality Channel

Table 7. Price pressure and spillover effects

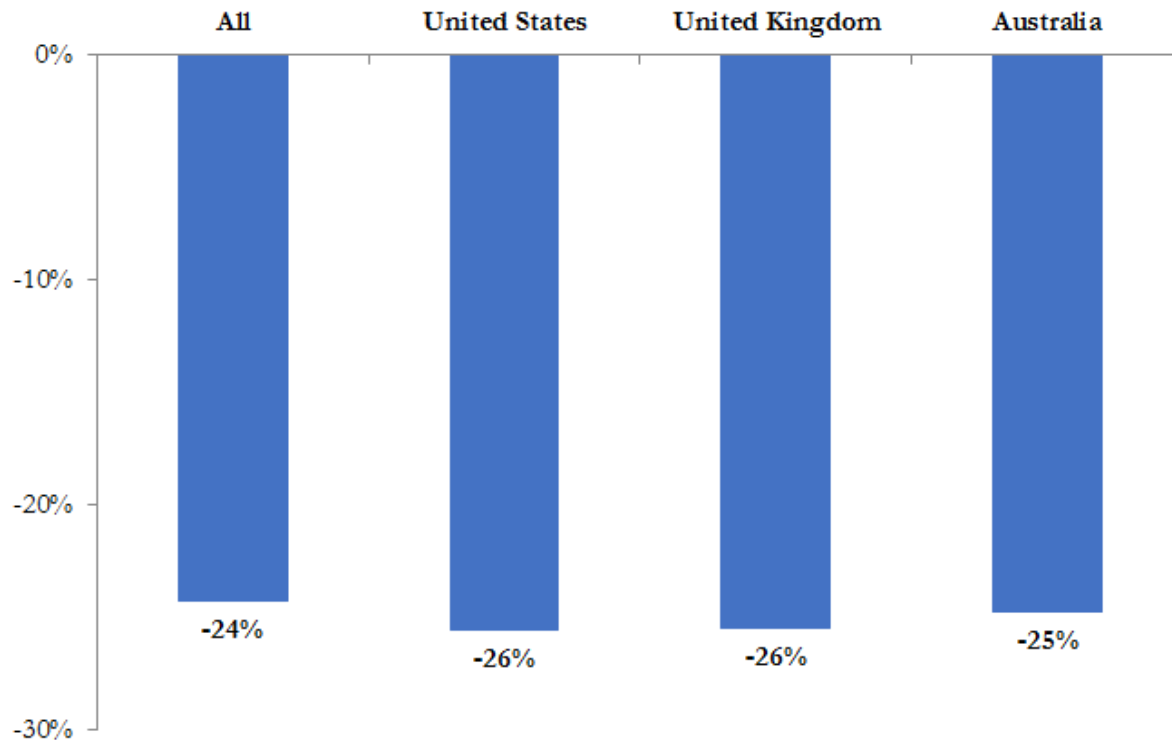
	Floor (1)	Block (2)	Estate (3)
Haunted house	-0.0527*** (0.0016)	-0.0226*** (0.0020)	-0.0121*** (0.0014)
Haunted house * Affected unit sold	0.0070 (0.0530)	-0.0350*** (0.0049)	-0.0093*** (0.0001)
Size	0.0014*** (0.0001)	0.0014*** (0.0001)	0.0014*** (0.001)
Age	-0.0171*** (0.0003)	-0.0186*** (0.0003)	-0.0213*** (0.0006)
Unit fixed-effects	Yes	Yes	Yes
Year-month fixed effects	Yes	Yes	Yes
Adj. R-squared	0.976	0.976	0.976
N	323,586	324,025	199,516

Effect of Haunted Houses on Liquidity

Window	Unit			Floor			Block		
	Excess fraction of sales		%	Excess fraction of sales		%	Excess fraction of sales		%
	Haunted	District	Difference	Haunted	District	Difference	Haunted	District	Difference
A. One year before to one year after									
Before	-1.9%	0.3%	-2.1%	-1.7%	-0.1%	-1.6%	0.5%	0.1%	0.4%
After	6.2%	0.4%	5.8%	-0.8%	0.2%	-0.9%	0.5%	-0.1%	0.5%
Difference	8.0%	0.1%	8.0%	0.9%	0.2%	0.7%	0.0%	-0.1%	-0.1%
B. Two years before to two years after									
Before	-5.4%	0.3%	-5.7%	-3.2%	-0.1%	-3.1%	0.4%	0.1%	0.3%
After	5.3%	-0.3%	5.6%	-2.0%	0.1%	-2.1%	-0.1%	-0.7%	0.6%
Difference	10.7%	-0.6	11.3%	1.2%	0.2%	1.0%	-0.5%	-0.8%	-0.3%
C. Three years before to three years after									
Before	-7.2%	0.5%	-7.6%	-4.6%	-0.4%	-4.2%	0.4%	0.2%	0.2%
After	2.9%	-0.2%	3.0%	-4.1%	-0.6%	-3.5%	-1.3%	-2.1%	0.8%
Difference	10.0%	-0.6%	10.6%	-0.5%	-0.2%	0.7%	-1.6%	-2.2%	0.6%

External validity: Is Hong Kong special?

1. Is Hong Kong special in pricing haunted houses?
 - Search of newspaper articles about haunted houses using keywords related to haunted houses and house prices



External validity: Is Hong Kong special?

2. Is Hong Kong special with regards to its aversion to houses that have had unnatural deaths?
 - A study of U.S. case law suggests that it is illegal for a seller to hide the fact that the property being sold is haunted (Stambovsky v. Ackley, 1991, NY Supreme Court, Appellate Division)
 - The website, www.diedinhouse.com, claims to be the first of its kind. It tells you who has died in a property being listed.

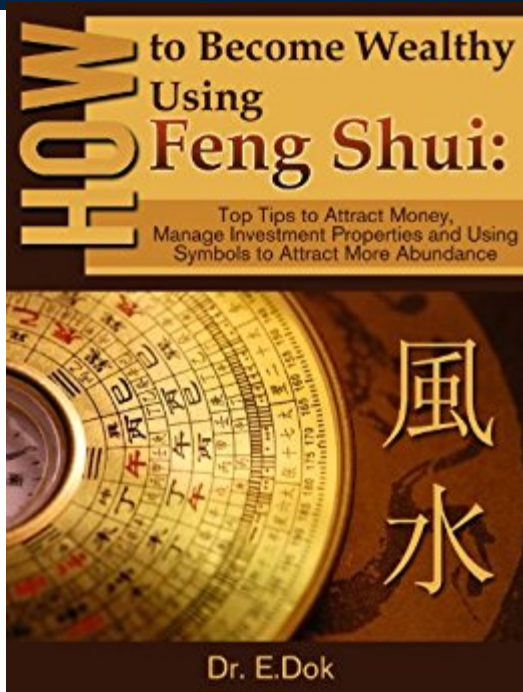
Additional Data

- Current draft is based on data on haunted houses from 4 real estate websites
 - Collected from newspaper reports
 - Unfortunately, addresses of haunted units are often incomplete
- Our current research design is conservative, which biases the estimated spillover effects towards zero
- Next draft will have complete addresses for all unnatural deaths in Hong Kong
 - Cause of death data from the Coroner's Court
 - Name, age, gender, address, date & cause of death
 - Allow us to estimate the spillover effects with greater statistical power

CONCLUSION

- We exploit the institutional setting in Hong Kong's residential real estate market to identify the effect of spillovers on asset prices
- We find a ripple effect of haunted houses on prices, as they drop by
 - 20% for affected units
 - 5% for units on the affected floor
 - 3% for units in the affected block
 - 1% for units in the affected estate
- The ripple effect is strongest for murders; price recovery is slow
- We document (for the first time) that perceived asset quality contributes significantly to spillovers in asset prices

FENG SHUI AND FINANCE



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