Cross-market Spillovers of Real Estate Speculation

Maggie Rong Hu, The Chinese University of Hong Kong

Wayne Xinwei Wan, Monash University

Ke Xu, The University of Hong Kong

2023 ASSA Annual Meeting

January 2023

Short-term Speculators in Real Estate Markets

- **Short-term speculators have a high presence in various global property markets**

- **For example, flippers who buy and resale within 2 years in housing market**
  - 15.8% in Hong Kong from 1992 to 2017, peaked at 23.2% in 2009 (Agarwal et al., 2022)
  - 4-17% in L.A. from 1991 to 2007 (Bayer et al., 2021)
  - 14.5% in Singapore from 2006 to 2010 (Tu & Zhang, 2019)

- **Impact of flippers on the property market is under debate:**
  - Result in mispricing and housing bubbles (Chinco & Mayer, 2015)
  - Provide market liquidity and a mitigating effect on market volatility (Fu et al., 2015; Wong et al, 2018; Tu & Zhang, 2019)
  - Different roles: middlemen and speculators (e.g., Bayer et al., 2021; Chi et al., 2021)

Anti-speculation Policies in Global Real Estate Markets

- **Governments in various global markets implement different anti-speculation policies, such as:**
  - Additional stamp duty for resales in 2-3 years (Hong Kong)
  - Restrict transfers of presale contracts before settlement (Hong Kong)
  - Prohibit resales of subsided housing in 5 years (Singapore)
  - Pay stamp duty in advance for presale contracts (Singapore)
  - Higher capital gain tax for short-term holders within 1 year (Australia)

- **How does flippers and the market react to the anti-speculation policies, particularly the Tobin tax?**
  - Agarwal, S., Chau, K. W., Hu, M. R., & Wan, W. X. (2022). “Tobin tax policy, housing speculation, and property market dynamics”. *Working Paper*.

Research Question (1)

- **Where does the "hot money" from the flippers go?**
  - Anti-speculation policies have unintended externalities on other submarkets due to spillovers

- **Motivation from the stock market:**
  - Tobin tax in stock market leads to trading frenzy in warrant market (Cai et al., RFS 2020)
  - Housing investors enter stock market and purchase shares of developers (Qian et al., 2022)

- **Questions:**
  - Given anti-speculation policy in *presale residential* market, will flippers spill over to *spot residential* market?
  - Given anti-speculation policy in *entire residential* market, will flippers spill over to *non-residential* market?

Presales --- An Innovation from Hong Kong

In 1954, Dr. Henry Fok created payment by installments and forward sales in Hong Kong residential property market to make flats more affordable.

Research Question (2)

- **What are the impacts of flippers (and the Tobin tax) on property market volatility?**
  - **Behavior finance theories:** short-term noise traders generate excess volatility (e.g., Hong and Stein, 1999)
  - **Financial economics theories:** short-term informed speculators provide market liquidity, promote information efficiency, and stabilize the market price (e.g., Schwert and Seguin, 1993).

- **Fu, Qian and Yeung (2016):** Tobin tax has differential effects on noise traders and informed speculators. More informed speculators withdraw after the policy, leading to higher market volatility.
  - Assumption: the policy aims to slow price appreciation and is arguably exogenous to price volatility

- **Our setting of cross-market spillover:**
  - *Improved identification:* In a market sector which is not directly affected by policy shocks but have flippers spilling over from other market sectors.
  - *New insights:* What kind of flippers are more likely to spill over to comparable markets?

Institutional Background: Two Quasi-natural Experiments (1)

Anti Presale Speculation Policy 1994

- **Effective Date:** 8th Jun 1994
- **Target Market:** Presale Residential Property Market Only
- **Measures:**
  1. **Lower quota of presale units:** From 50% to 10%
  2. **Shorten presale periods:** From 2-years before completion to at most 9 months
  3. **Increase deposit of buyers:** From 5% to 10%
  4. **Prohibit transfers of presale contracts for a certain holding period**

Institutional Background: Two Quasi-natural Experiments (2)

Special Stamp Duty Policy 2010

- **Effective Date:** 20th Nov 2010
- **Target Market:** Entire (Presale + Spot) Residential Property Market
- **Measures:**
  1. **If sold within 6 months:** additional tax of 15%
  2. **If sold within 6 - 12 months:** additional tax of 10%
  3. **If sold within 1 - 2 years:** additional tax of 5%

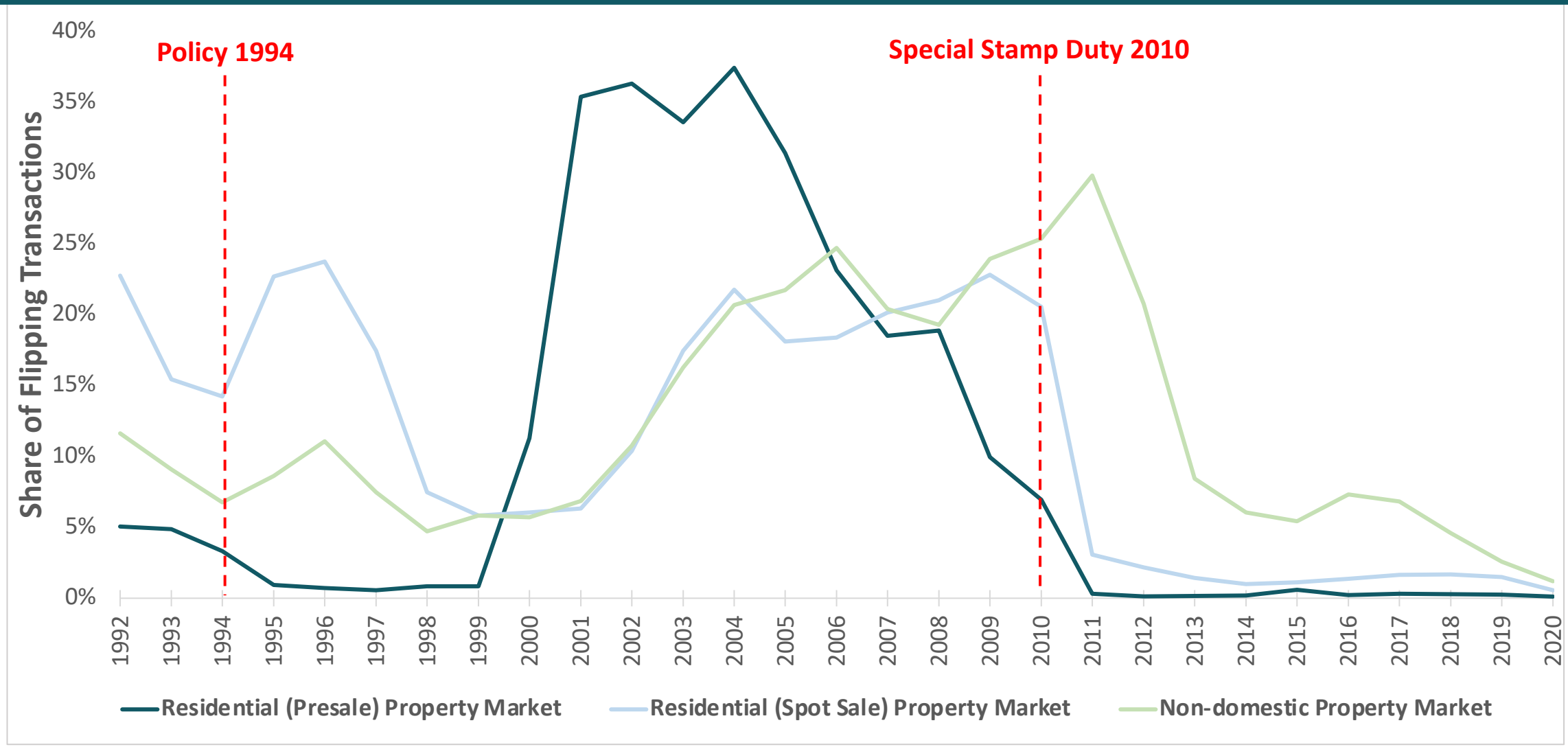
Definition of Flippers

- **Flippers in the Presale Housing Market:**
  - Buyers who **buy** the property **before** the completion date and **resell** it before project completion (Fu et al, MS 2016).

- **Flippers in the Spot Housing Market:**
  - Buyers who hold the property for **less than 2 years** (Bayer et al., RFS 2021).

- **Identify cross-market movements of pre-treatment flippers after the policy shock**
  - Denoted as “Pre-flippers”
  - With controls of flippers’ individual fixed effects

Summary of Policy Effects on Flipper's Market Presence



Key Findings (1)

1. **Given anti-speculation policies in the presale residential property market only, flippers will flow into the spot residential property market.**

- Both share and number of flipping transactions in the presale housing market decreased significantly.
- Share of flipping transactions in the spot housing market increased by 7.68 ppts.
- After the policy, existing flippers in the presale housing market are 11.92 ppts more likely to speculate in the spot residential property market, after controlling for buyers' fixed effects.

Key Findings (2)

2. **After the anti-speculation policies extend to the entire residential property market in 2010, there is no strong evidence that the cross-market flipper spillover continues to the non-residential property market.**

- Explanation: the non-residential properties are not comparable speculation targets to the residential properties: different return & risk profiles; unfamiliar asset classes to housing speculators; institutional vs. individual investors.

3. **In the spot residential property market that flippers spill over into after 1994, the price volatility decreased by 1.56 ppts.**

- It implies that flippers that spillover to comparable markets are more likely to be informed trader. They stabilize the housing price and decrease price volatility in the real estate market.

Contributions

1. **This study provides new evidence of cross-market speculation spillovers under anti-speculation policies in real estate market**

   - Speculation literature of mainstream financial markets: stock & warrant (Cai et al, RFS 2021)
   - Real estate literature on presale and spot market relationship (Chau et al., 2003; Yiu et al., 2006)

2. **This study adds to the debate on the role of flippers in the real estate market, supporting their market-stabilizing roles via an improved identification strategy.**

   - Some literature argue less informed flippers decrease price stability and increase mispricing (Tobin 1978; Stiglitz 1989; Summers and Summers 1989; Chinco and Mayer 2015).
   - Other show that informed flippers improve liquidity and stabilize housing price (Bayer et al., 2021; Fu et al., 2016)

Data

Complete Property Transaction Data for Hong Kong Land Registry (EPRC)

- Sample period: Jan 1991 – Dec 2020
- Sub-markets: residential and non-residential (office, retail, and industrial)
- Sample size: 2,135,800 transaction records
- Information: transaction date, price, buyers' and sellers' names, property address, building age, floor level, salable floor area, number of rooms, property type, etc.

Summary Statistics

Residential Property Transaction Data

Variable	N	mean	sd	min	P25	P50	p75	max
Total Price (million HKD)	1,987,493	4.738	5.715	2.089	3.350	5.488	0.001	940.397
Size	1,987,493	52.946	25.614	38.090	47.566	60.386	4.366	3,480.026
Price per sqm (thousand HKD)	1,987,493	83.317	50.784	49.613	71.106	102.559	0.014	2,440.579
Floor	1,987,493	16.780	12.217	7	14	23	-4	90
Building Age	1,987,493	11.900	12.020	1	9	20	0	64
Urban Area	1,987,493	0.474	0.499	0	0	1	0	1
Flipper	1,987,493	0.129	0.335	0	0	0	0	1
Presale	1,987,493	0.214	0.410	0	0	0	0	1

Non-residential Property Transaction Data

Variable	N	mean	sd	min	P25	P50	p75	max
Total Price (million HKD)	148,307	5.173	9.279	1.379	2.581	5.199	0.007	534.911
Size	148,307	96.171	140.500	35.210	60.572	100.706	0.465	5,404.775
Price per sqm (thousand HKD)	148,307	89.665	163.851	22.059	45.714	96.780	0.025	8,196.885
Floor	148,307	9.112	7.428	3	8	14	-4	49
Building Age	148,307	15.994	12.081	5	16	24	0	64
Urban Area	148,307	0.608	0.488	0	1	1	0	1
Flipper	148,307	0.145	0.352	0	0	0	0	1
Presale	148,307	0.101	0.301	0	0	0	0	1

Empirical Models (1):
Reducing Flipping Transactions in the Target Market

At the building-month level, we investigate the change in the share of flippers after the policy:

$$Share\ of\ flip\ number_{it} = \alpha + \beta_1 Policy_t + \gamma P_t + \omega_i + \varepsilon_{it}$$

$$Share\ of\ flip\ amount_{it} = \alpha + \beta_1 Policy_t + \gamma P_t + \omega_i + \varepsilon_{it}$$

- $Share\ of\ flip\ number_{it}$ is the share of transaction number made by **flippers** in building *i* in month *t*.
- $Share\ of\ flip\ amount_{it}$ is the share of transaction amount made by **flippers** in building *i* in month *t*.
- $Policy_t$ is a dummy variable which equals one after enacting the policy, 0 otherwise.
- P_t is quarterly Hong Kong housing price index.
- ω_i represents the district fixed effects.
- ε_{it} denotes the error term.
- Standard errors are clustered at the district level.

Empirical Models (1):
Reducing Flipping Transactions in the Target Market

At the building-month level, we compare the transactions by flippers and non-flippers:

$$Log\ (trans\ number)_{it} = \alpha + \beta_1 Flipper_{it} + \beta_2 Flipper_{it} * Policy_t + \varphi_t + \omega_i + \varepsilon_{it}$$

$$Log\ (trans\ amount)_{it} = \alpha + \beta_1 Flipper_{it} + \beta_2 Flipper_{it} * Policy_t + \varphi_t + \omega_i + \varepsilon_{it}$$

- $Log\ (trans\ number)_{it}$ is the transaction number by **flippers or non-flippers** in building *i* in month *t*.
- $Log\ (trans\ amount)_{it}$ is the transaction number by **flippers or non-flippers** in building *i* in month *t*.
- $Policy_t$ is a dummy variable which equals one after enacting the policy, 0 otherwise.
- $Flipper_{it}$ is a dummy variable equal to one for the aggregated transaction number (or amount) of flipper buyers, 0 otherwise.
- φ_t is the year-month fixed effect
- ω_i represents the district fixed effects.
- ε_{it} denotes the error term.
- Standard errors are clustered at the year-month and district level.

Main Results (1):
Reducing Flipping Transactions in Target Markets

Anti Presale Speculation Policy 1994

- Dependent Variable: **share of flipper transaction number/amount** at building-month level

	(1)	(2)	(3)	(4)
	Presale Residential Property Market			
	[-1,+1 year] Share of flip number	[-2,+2 years] Share of flip number	[-1,+1 year] Share of flip amount	[-2,+2 years] Share of flip amount
$Policy_{1994}$	-0.0134**	-0.0151***	-0.0129**	-0.0147**
	(0.0054)	(0.0055)	(0.0055)	(0.0055)
Property Price Index	YES	YES	YES	YES
District FE	YES	YES	YES	YES
Observations	1,369	2,647	1,369	2,647
R-squared	0.0469	0.0302	0.0474	0.0304

Main Results (1):
Reducing Flipping Transactions in Target Markets

Anti Presale Speculation Policy 1994

- Dependent Variable: **aggregate transaction number/amount by flippers or non-flippers** at building-month level

	(1)	(2)	(3)	(4)
	Presale Residential Property Market			
Dependent Variable	[-1,+1 year] log(transaction number)	[-2,+2 years] log(transaction number)	[-1,+1 year] log(transaction amount)	[-2,+2 years] log(transaction amount)
Flipper*Policy$_{1994}$	-0.2498**	-0.2979***	-0.3320***	-0.3925***
	(0.1141)	(0.0859)	(0.1089)	(0.0831)
Flipper	-1.5177***	-1.5348***	-2.5468***	-2.5266***
	(0.0374)	(0.0318)	(0.0432)	(0.0326)
Year-month FE	YES	YES	YES	YES
District FE	YES	YES	YES	YES
Observations	2,738	5,294	2,738	5,294
R-squared	0.4884	0.4613	0.5906	0.5718

Main Results (1):
Reducing Flipping Transactions in Target Markets

Special Stamp Duty Policy 2010

- Dependent Variable: **share of flipper transaction number/amount** at building-month level

	(1)	(2)	(3)	(4)
	Presale & Spot Residential Property Market			
	[-1,+1 year]	[-2,+2 years]	[-1,+1 year]	[-2,+2 years]
Dependent Variable	Share of flip number	Share of flip number	Share of flip amount	Share of flip amount
$Policy_{SSD}$	-0.1420***	-0.1486***	-0.1404***	-0.1467***
	(0.0080)	(0.0083)	(0.0079)	(0.0082)
Property Price Index	YES	YES	YES	YES
District FE	YES	YES	YES	YES
Observations	103,166	183,570	103,166	183,570
R-squared	0.1011	0.1101	0.0997	0.1088

Main Results (1):
Reducing Flipping Transactions in Target Markets

Special Stamp Duty Policy 2010

- Dependent Variable: **aggregate transaction number/amount by flippers or non-flippers** at building-month level

	(1)	(2)	(3)	(4)
	Entire (Presale & Spot) Residential Property Market			
	[-1,+1 year]	[-2,+2 years]	[-1,+1 year]	[-2,+2 years]
Dependent Variable	log(transaction number)	log(transaction number)	log(transaction amount)	log(transaction amount)
Flipper*Policy$_{SSD}$	-0.2800***	-0.3055***	-0.6104***	-0.7103***
	(0.0092)	(0.0070)	(0.0259)	(0.0190)
Flipper	-0.5828***	-0.5637***	-1.1506***	-1.0862***
	(0.0071)	(0.0052)	(0.0186)	(0.0132)
Year-month FE	YES	YES	YES	YES
District FE	YES	YES	YES	YES
Observations	206,332	367,140	206,332	367,140
R-squared	0.4833	0.4816	0.5108	0.5144

Empirical Model (2):
Spillover of Flipping Transactions across the Markets

At the aggregated level, we compare the impacts of policies on the non-targeted sub-markets:

Policy 1994: Target at *presale residential*, examine spillover to *spot residential* (Non-residential as falsification)

$$Share\ of\ flip\ number_{it} = \alpha + \beta_1 Policy_{1994} + \gamma P_t + \omega_i + \varepsilon_{it}$$
$$Share\ of\ flip\ amount_{it} = \alpha + \beta_1 Policy_{1994} + \gamma P_t + \omega_i + \varepsilon_{it}$$

Special Stamp Duty: Target at *entire residential*, examine spillover to *non-residential*

$$Share\ of\ flip\ number_{it} = \alpha + \beta_1 Policy_{SSD} + \gamma P_t + \omega_i + \varepsilon_{it}$$
$$Share\ of\ flip\ amount_{it} = \alpha + \beta_1 Policy_{SSD} + \gamma P_t + \omega_i + \varepsilon_{it}$$

Main Results (2):
Spillover of Flipping Transactions across the Markets – Policy 1994

Anti Presale Speculation Policy 1994: Spillover to Spot Residential Property Market?

- Dependent Variable: **share of flipper transaction number/amount** at building-month level

	(1)	(2)	(3)	(4)
	Spot Residential Property Market			
	[-1,+1 year]	[-2,+2 years]	[-1,+1 year]	[-2,+2 years]
Dependent Variable	Share of flip number	Share of flip number	Share of flip amount	Share of flip amount
$Policy_{1994}$	0.0394***	0.0768***	0.0393***	0.0766***
	(0.0047)	(0.0047)	(0.0047)	(0.0047)
Property Price Index	YES	YES	YES	YES
District FE	YES	YES	YES	YES
Observations	65,323	131,739	65,323	131,739
R-squared	0.0101	0.0137	0.0101	0.0137

Main Results (2):
Spillover of Flipping Transactions across the Markets – SSD 2010

Special Stamp Duty Policy 2010: Spillover to Non-residential Property Market?

- Dependent Variable: **share of flipper transaction number** at building-month level

	(1)	(2)	(3)	(4)	(5)	(6)
	Retail [-2,+2 years] Share of flip number	Retail [-2,+2 years] Share of flip amount	Industrial [-2,+2 years] Share of flip number	Industrial [-2,+2 years] Share of flip amount	Office [-2,+2 years] Share of flip number	Office [-2,+2 years] Share of flip amount
Dependent Variable						
PolicySSD	0.0316	0.0282	0.1213	0.1381	-0.0071	-0.0016
	(0.0257)	(0.0268)	(0.0891)	(0.0785)	(0.0245)	(0.0285)
Property Price Index	YES	YES	YES	YES	YES	YES
District FE	YES	YES	YES	YES	YES	YES
Observations	1,636	1,636	265	265	988	988
R-squared	0.0889	0.0623	0.1121	0.1114	0.1457	0.1139

Empirical Model (3):
Existing Flippers' Cross-market Movements

At the individual buyer level, we compare the transactions made by pre-treatment flippers only:

- **Will pre-flippers (who flipped in the policy's *target* market before) continue to flip in:**

  - Target market sector?
  - Non-target market sectors?
  - Entire property market?

- **Model: Transactions by of pre-flippers around the policy; with buyers' fixed effects.**

$$Flip_{it} = \alpha + \beta_1 Policy_{1994} + \mu_i + \omega_i + \varepsilon_{it}$$

$$Flip_{it} = \alpha + \beta_1 Policy_{SSD} + \mu_i + \omega_i + \varepsilon_{it}$$

Main Results (3):
Existing Flippers' Cross-market Movements – Policy 1994

➢ **Pre-flippers in Presale Residential Property Market before Policy 1994**

	(1)	(2)	(3)	(4)	(5)	(6)
	Presale & Spot	Presale	Spot	Presale & Spot	Presale	Spot
	Residential [-2,+2 years] OLS	Residential [-2,+2 years] OLS	Residential [-2,+2 years] OLS	Residential [-2,+2 years] Probit	Residential [-2,+2 years] Probit	Residential [-2,+2 years] Probit
Dependent Variable	Flip	Flip	Flip	Flip	Flip	Flip
$Policy_{1994}$	-0.0952**	-0.5950***	0.1192***	-0.2137***	-0.7983***	0.1300***
	(0.0465)	(0.1002)	(0.0453)	(0.0468)	(0.1165)	(0.0362)
District FE	YES	YES	YES	NO	NO	NO
Buyer FE	YES	YES	YES	NO	NO	NO
Observations	3,256	2,255	1,001	3,256	2,255	1,001
(Pseudo) R-squared	0.5521	0.7729	0.5161	0.0208	0.0501	0.0149

Main Results (3):
Existing Flippers' Cross-market Movements – SSD 2010

➢ **Pre-flippers in the Residential Property Market before Special Stamp Duty Policy 2010**

	(1)	(2)	(3)	(4)	(5)
	Residential & Non-residential	Residential	Retail	Industrial	Office
	[-2,+2 years]	[-2,+2 years]	[-2,+2 years]	[-2,+2 years]	[-2,+2 years]
	OLS	OLS	OLS	OLS	OLS
Dependent Variable	Flip	Flip	Flip	Flip	Flip
PolicySSD	-0.5455***	-0.5825***	-0.0558	0.5000	-0.1089
	(0.0091)	(0.0076)	(0.0514)	(0.8272)	(0.0956)
District FE	YES	YES	YES	YES	YES
Buyer FE	YES	YES	YES	YES	YES
Observations	84,672	81,586	1,845	164	1,077
R-squared	0.5423	0.5630	0.7521	0.8960	0.7617

Empirical Model (4):
Impact of Flippers' Cross-market Spillover on Price Volatility

After Policy 1994, flippers spill over from presale to spot market. What is the impact on spot market volatility?

- **Focus on *Spot* Housing Market after Policy 1994 took effect in *Presale* Housing Market**

$$Price\ Volatility_{it} = \alpha + \beta_1 Policy_{1994} + \beta_2 Log(transaction\ number)_{it} + \gamma_1 P_t + \gamma_2 M_t + \varphi_t + \omega_i + \varepsilon_{it}$$

- $Price\ Volatility_{it}$: The price volatility in building *i* over month *t*, measured as the highest and lowest log(transaction price) after adjustment to a hedonic model (Fu et al., MS 2016).
- $Log(trans\ number)_{it}$: Total number of transactions in building *i* over month *t* (Marsh and Rosenfeld, 1986).
- $Policy_{1994}$ is a dummy variable which equals one after enacting Policy 1994, 0 otherwise.
- P_t represents the quarterly price index in the Hong Kong housing market.
- M_t includes the monthly Hong Kong consumer price index and quarterly Hong Kong gross domestic product.
- φ_t represents the year-quarter fixed effects.
- ω_i represents the district fixed effects.
- ε_{it} denotes the error term.
- Standard errors are clustered at the year-quarter and district level.

Main Results (4):
Impact of Flippers' Cross-market Spillover on Price Volatility

Focus on Spot Housing Market Volatility after Policy 1994

	(1)	(2)	(3)	(4)
	Spot Housing Market			
	[-1,1 year]	[-2,2 years]	[-1,1 year]	[-2,2 year]
Dependent Variable	Price Volatility	Price Volatility	Price Volatility	Price Volatility
$Policy_{1994}$	-0.0230***	-0.0156***	-0.0240***	-0.0206***
	(0.0040)	(0.0041)	(0.0060)	(0.0059)
log(total transaction number)	0.0784***	0.0773***	0.0783***	0.0781***
	(0.0044)	(0.0036)	(0.0027)	(0.0023)
Property Price Index	YES	YES	YES	YES
Macroeconomic Controls	YES	YES	YES	YES
District FE	YES	YES	YES	YES
Year-quarter FE	NO	NO	YES	YES
Observations	22,320	40,902	22,320	40,902
R-squared	0.1182	0.0877	0.1202	0.0927

Robustness Tests

We have also conducted a battery of robustness checks for our main results:

- **Placebo tests with hypothetical policy shocks in one year before Policy 1994**
  - No direct policy effect on flipping transactions in the presale housing market
  - No spillover effect on flipping transactions in the spot housing market
  - No effect on volatility in the spot housing market

- **Placebo tests with hypothetical policy shocks in one year before SSD 2010**
  - No direct policy effect on flipping transactions in the entire housing market
  - No spillover effect on flipping transactions in the non-residential market

- **Falsification tests for spillovers into non-domestic property sectors after Policy 1994**

Conclusion

Main Findings:

- The two anti-speculation policy shocks curbed flipping transactions in the target market sectors.
- Given anti-speculation policy in presale residential market only, flippers spill over to spot residential market.
- Given anti-speculation policy in entire residential market, no strong evidence for flippers entering non-domestic markets.
- The spillover of flippers into spot housing market lowers the price volatility, potentially because the flippers who spills over to comparable markets are more likely to be informed traders.

Policy Implications:

- It is important to consider the cross-market flipper spillovers when regulating speculations in the real estate market.
- Contradict to the common blames of flippers, we support the literature that informed flippers are likely to have a market stabilizing effect.

Q&A

Thanks!