Tobin Tax Policy, Housing Speculation, and Property Market Dynamics

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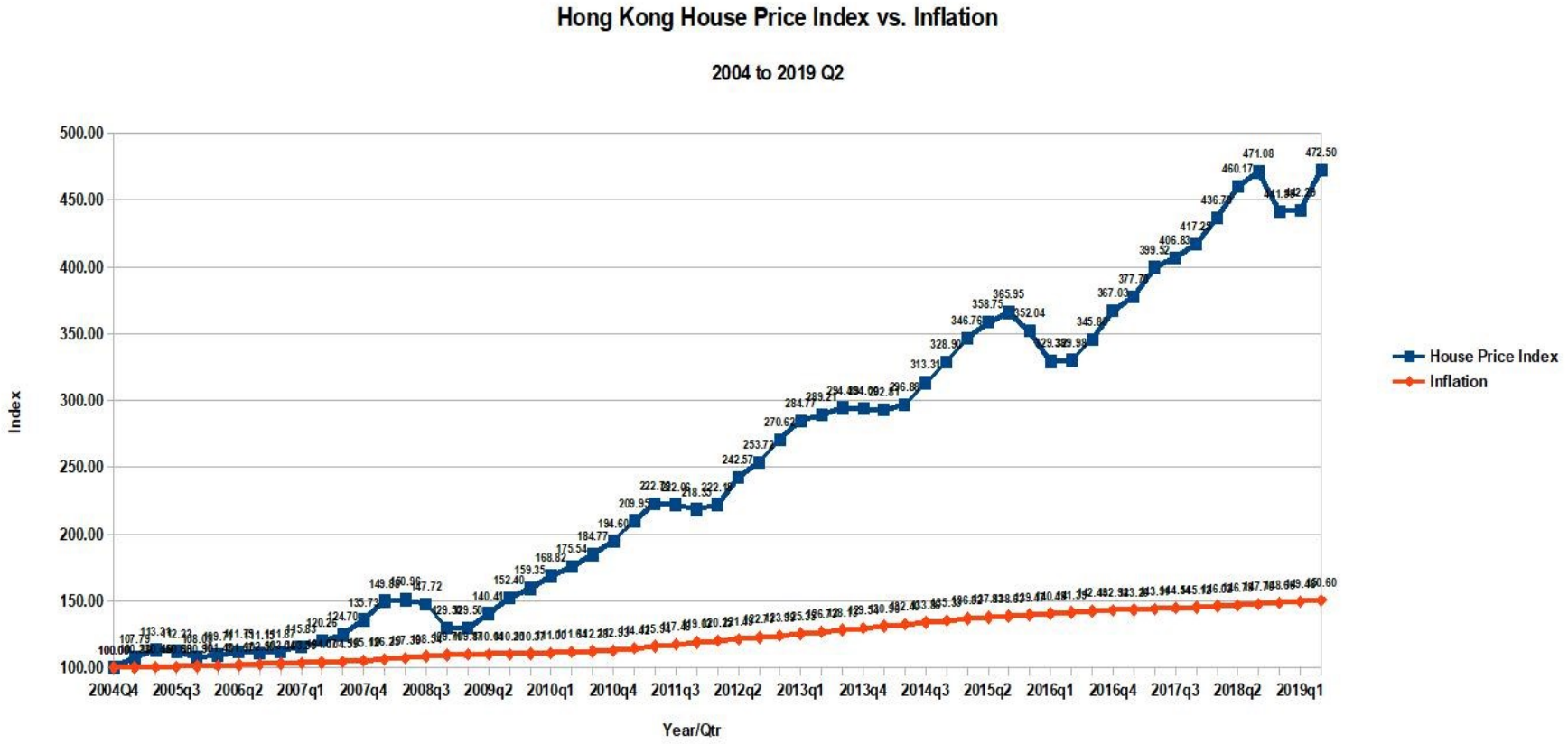
Motivation

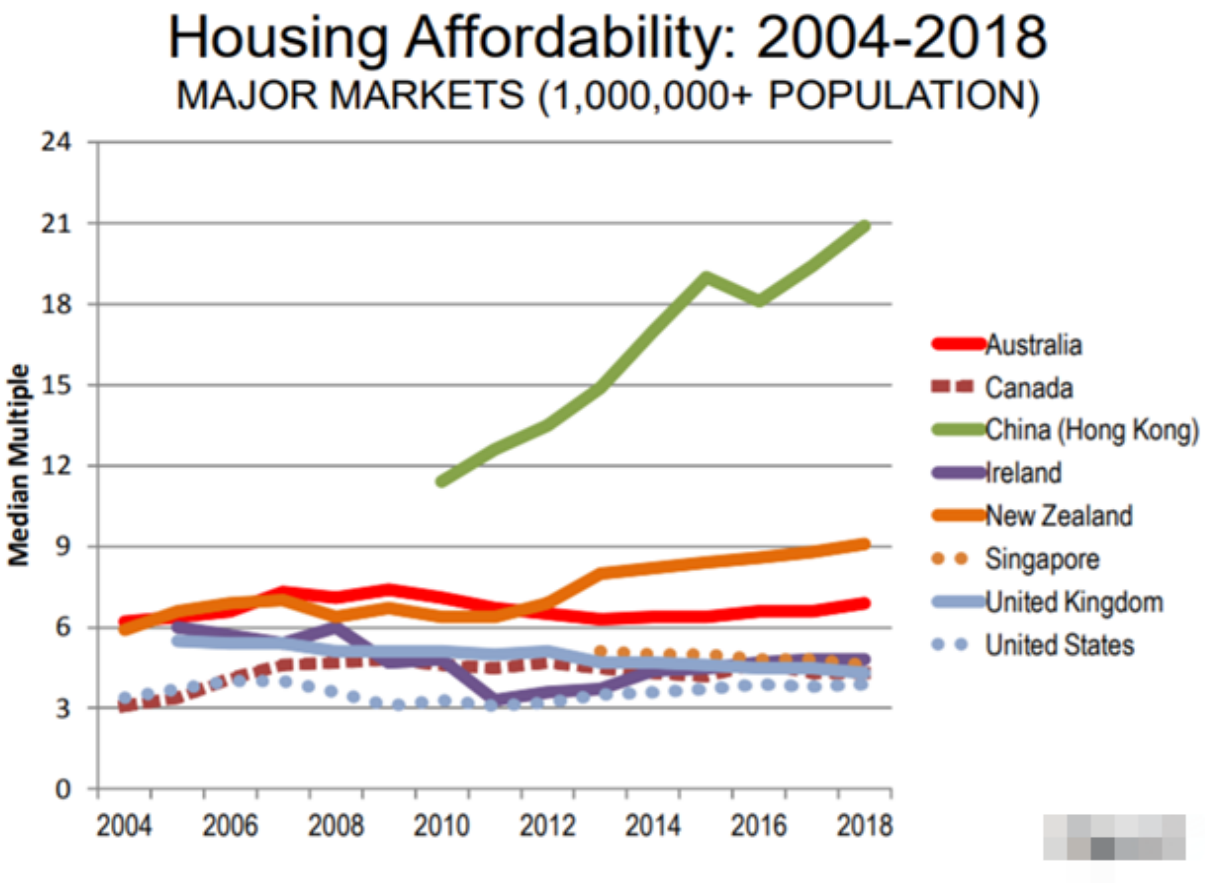
- **Skyrocketing housing price in Hong Kong**
  - From 2004 to 2019, the residential property prices have risen almost 5 times, while inflation rate only growth 1.5 times.



Source: http://systemisbroken.blogspot.com/2019/09/hong-kong-house-price-havent-budged-yet.html

Motivation

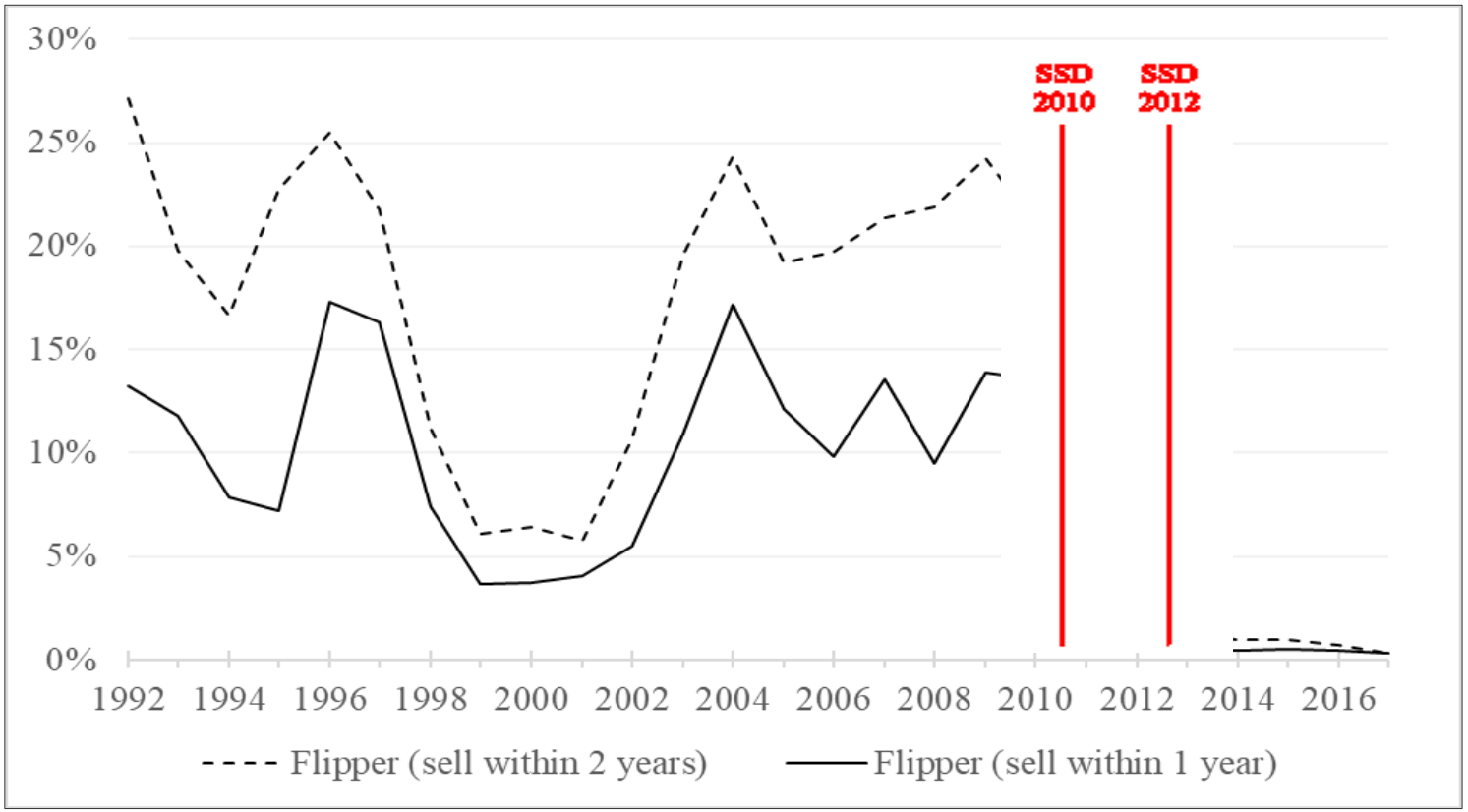
- **HK: the world's priciest housing market for many years**
  - HK apartments cost **about 21** times gross annual median income in 2018



- **Short-term speculation is criticized as one of the main reasons.**

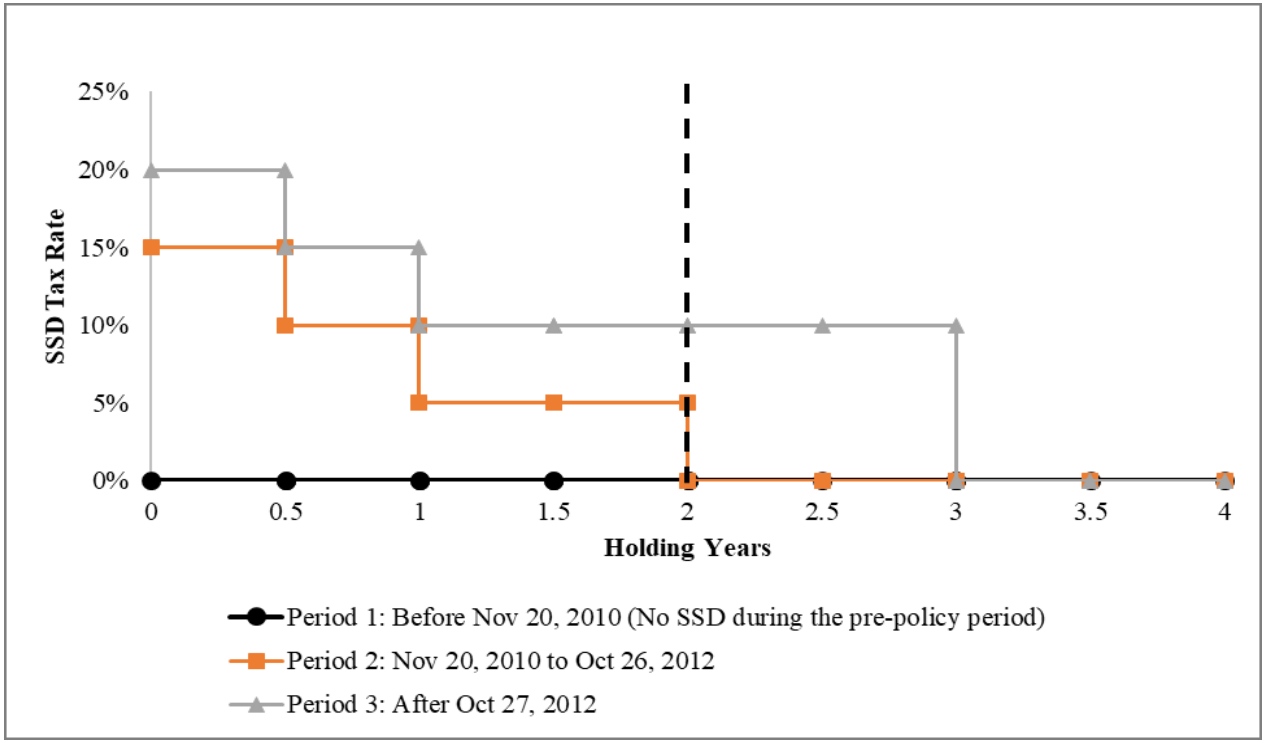
Flippers in HK Housing Market

- **Flippers form a sizable proportion of Hong Kong's housing market**
  - Definition: those sell within two years' home purchase
  - Flippers account for **15.8%** of the transactions from 1992 to 2017.
  - The proportion is especially high at **23.2%** in 2009.



HK's Special Stamp Duty (SSD) Policies

- **The HK Government introduced SSD in Nov 2010, targeting at flippers**
- **Phase 1 SSD** (from Nov 2, 2010 to Oct 26, 2012):
  - Extra 5% – 15% stamp duty if resell within 2 years of purchase
- **Phase 2 SSD** (After Oct 2012 – Present):
  - Extra 10% – 20% stamp duty if resell within 3 years of purchase



Literature

- **The impact of Short-term speculators on housing market is under debate: causing mispricing versus providing liquidity**
  - Resulting in significant **mispricing** in the housing market (Bayer et al., 2011; Chinco & Mayer, 2015).
  - Flippers improve market liquidity and have a mitigating effect on market volatility (Fu & Qian, 2014; Wong et al, 2018; Tu & Zhang, 2019).

- **Imposing Tobin Property Tax (i.e. Stamp Duty) for Flippers**
  - A common measure by governments to **regulate speculations**
    - Increase round-trip transaction cost for target group, hence **suppress demand** and reduce transaction.
  - Its effectiveness in **cooling down** market price is unclear (Best & Kleven, 2017; Deng et al., 2019; Lundborg & Skedinger, 1999)

Research Questions

- Using the comprehensive transaction data from 1992 to 2017 in HK housing market
- Using SSD polices as a shock to flipper presence in market

We aim to investigate **the 4 main questions:**

1. **What is flippers' role in Hong Kong's housing market?**
2. **Is SSD policy effective in curbing the flippers?**
3. **What are the flippers' strategic responses to the SSD policy?**
4. **Is SSD effective in cooling housing prices?**

Contribution

- **Contribute to the literature on using Tobin tax policies to regulate housing market**
  - By increasing transaction cost, SSD is able to reduce short-term flipping.
  - However, SSD is not effective in cooling market price.
  - We examine the potential mechanism and strategic response of speculators for this ineffectiveness of the policy.

- **Shed light on the impact of speculative investments on housing unaffordability**
  - Curbing flippers alone would not solve the housing unaffordability problem.

- **Expand the literature on flippers' role in housing market**
  - Our study offers more granular details and cleaner evidence
  - We also provide a novel discussion of flippers' strategic responses to SSD policy.

Data

- Complete housing transaction records from 1992 to 2017: 1,556,521 obs.
- Identification of housing flips and flippers(e.g., Bayer et al., 2011; Fu & Qian, 2014): **Selling within 2 years** from purchase dates
- **Pre-policy flippers**: defined as flippers (sellers with <=2 years holding period) before the SSD 2010
  - Speculation-motivated investors may hold longer in the post-SSD period to circumvent the policy and save tax.
  - Alternative identification: looking at **Pre-policy flippers** and track their housing activities post-SSD, to address undercounting & selection bias
- Details on Housing Features
  - Address, district, floor level, unit number, gross unit size, number of rooms, building age, lease term, etc

Findings (1):
Flippers' Performance in the Housing Market

- We find flippers are **more skilled** than other market participants.
  - They obtain 12.6% higher annualized returns than non-flippers
  - Buy at a 3.3% lower price and resell at a 3.1% higher price
  - Use SSD imposition as a negative exogenous shock for flippers' market presence

- **Spillover effect**:
  - **Flipping transactions** drive up prices of **subsequent non-flipping transactions** at close neighborhood (building) level
  - A 1% increase of flipping sales drives up housing prices in the same **building** by **0.2% to 0.9%** in the following year.

Baseline Results on Flippers' Prices and Returns

- **Flippers realize higher returns by buying low and selling high**

	(1) Annual return	(2) log (purchase price)	(3) log (sell price)
Flipper	**0.1255***** **(0.0068)**	**-0.0331***** **(0.0066)**	**0.0305***** **(0.0044)**
Observations	812,960	1,556,521	1,556,521
R-squared	0.346	0.855	0.855

- **Flippers' annualized capital gain returns drop 9% after SSD**

	(1) Annual return	(2) log (purchase price)	(3) log (sale price)
Flipper * SSD	**-0.0892***** **(0.0069)**	**0.0194*** **(0.0112)**	**-0.0207**** **(0.0087)**
Flipper	0.1274*** (0.0069)	-0.0334*** (0.0068)	0.0324*** (0.0046)
SSD	0.0102* (0.0054)	0.0156 (0.0130)	0.0269** (0.0126)
Observations	812,960	1,556,521	1,556,521
R-squared	0.348	0.855	0.855

Note: Physical Features, Year*Quarter Fixed Effect, and District Fixed Effect are controlled.

Result on the Spillover Effect of Flipping Sales

- **Spillover effect of flipping sales on the non-flipping transactions in the close neighborhood (Campbell et al, 2011 AER):**

$$\log(Price_{it}) = \beta_1 Flipper^{s}_{i,t-1} + X'_{it}\lambda + \gamma M_t + \varphi_i + \varepsilon_{it}$$

- **Instrumental variable**: Use the introduction of SSD in 2010 as IV for the flipper share or numbers, as flipper presence can be endogenous.

	(1)	(2)	(3)	(4)
	Non-Flipping Sales in the subsequent year Y = log (sell price)			
	OLS	IV	OLS	IV
Lagged % of Flipping sales	**0.1703*** (0.0221)**	**0.9030*** (0.1187)**		
Lagged Number of Flipping sales			**0.0043*** (0.0006)**	**0.0157*** (0.0025)**
Observations	872,267	872,267	883,475	883,475
R-squared	0.861	0.830	0.861	0.848

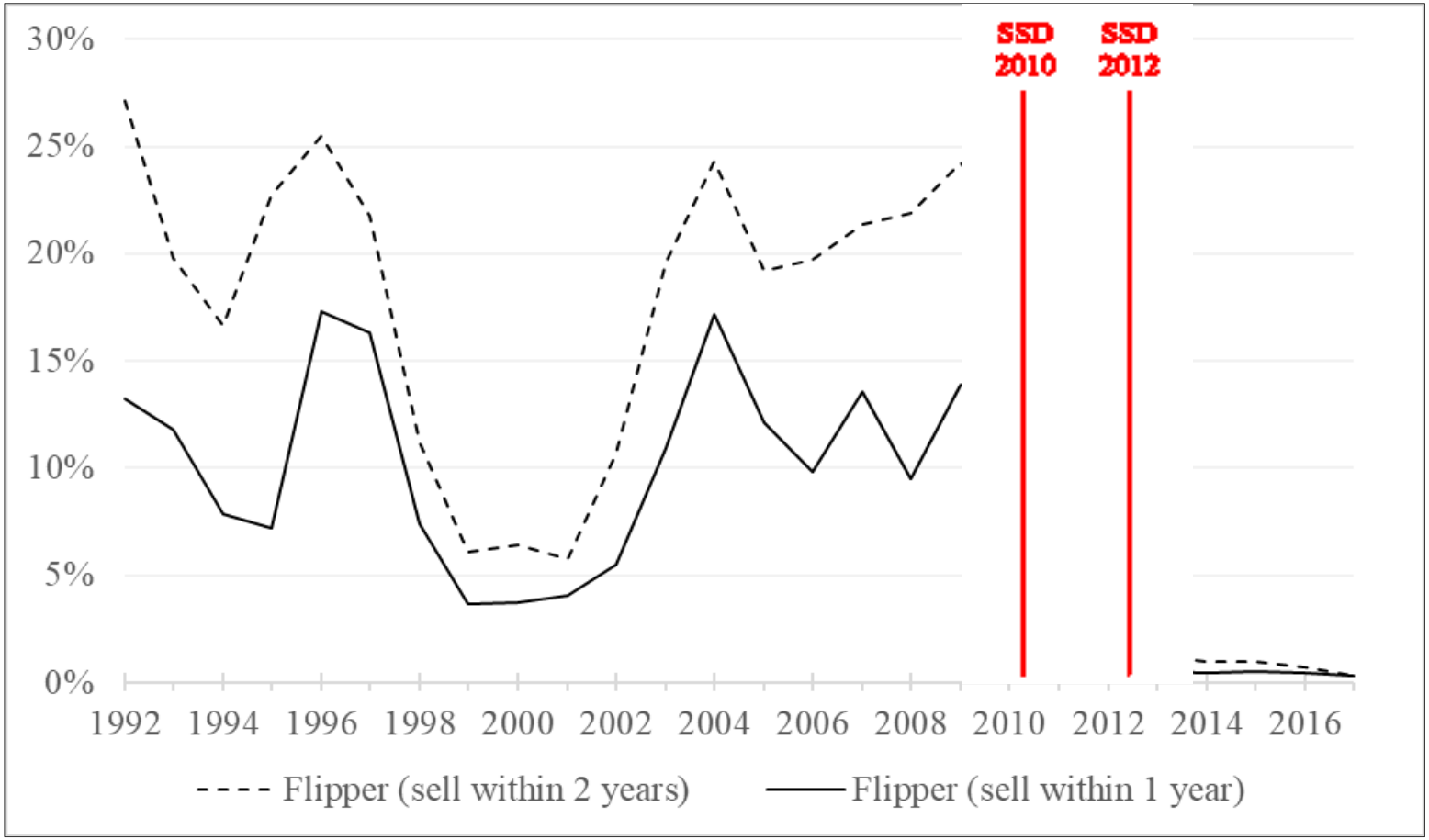
Physical Features, Year*Quarter Fixed Effect, and District Fixed Effect are controlled.

Findings (2):
The Effectiveness of SSD in Curbing Flippers

- **SSD sends negative shocks to flippers' presence and performance**
- **Flippers' share** fell from **23.2%** in 2009 to **1.3%** in 2013.
- Flippers' **annualized return** drop by **8.8%** on average.
- **Purchase price** increase **2%**, resale price drop by **1.9%**
- Flippers are 20% more likely to exit the market post-SSD (for Pre-policy flippers)

Effectiveness of SSD Policy in Curbing Flippers

- **SSD sends negative shocks to flippers' market presence and performance in housing transactions.**
  - **Flippers' share** fell from **23.2%** in 2009 to **1.3%** in 2013.



Holding Period Distribution Before and After SSD

	1 Year before SSD 2009.11.20-2010.11.19			After SSD Phase 1 2010.11.20-2012.10.26			After SSD Phase 2 2012.10.27- 2013.10.26		
Holding Period	N	%	Cum.	N	%	Cum.	N	%	Cum.
0-1 year	**12,746**	**12.81%**	**12.81%**	**487**	**0.41%**	**0.41%**	113	0.35%	0.35%
1-2 years	**8,134**	**8.18%**	**20.99%**	**2,211**	**1.86%**	**2.27%**	199	0.61%	0.96%
2-2.5 years	4,436	4.46%	25.45%	**6,831**	**5.76%**	**8.03%**	246	0.76%	1.71%
2.5-3 years	2,620	2.63%	28.08%	4,170	3.51%	11.54%	**179**	**0.55%**	**2.26%**
3-3.5 years	1,667	1.68%	29.76%	3,887	3.28%	14.82%	**1,952**	**6.00%**	**8.26%**
3.5-4 years	1,838	1.85%	31.60%	3,287	2.77%	17.59%	1,506	4.63%	12.89%
over 4 years	68,045	68.40%	100%	97,810	82.41%	100%	28,361	87.11%	100%
Total	99,486			118,683			32,556		

- Before SSD, flipping sales (with <=2 years holding period) are rampant with 21% market share in the 1-year window before SSD.
- After SSD Phase 1, %hold (2, 2.5) years is **5.76%**, much higher than 2.27% hold (0,2) years.
- After SSD Phase 2, %hold (3, 3.5) years is **6.00%,** much higher than 2.26% hold (0,3) years.
- → Flippers extend holding period and defer sales to avoid paying SSD.

Alternative Identification using Pre-Policy Flippers

- Speculation-motivated investors may hold longer in the post-SSD period to circumvent the policy and save tax expense.
- **Pre-policy flippers**: defined as flippers (sellers with <=2 years holding period) before the SSD 2010
- Track the activities of the pre-policy flippers to get a **clean** test of the impact of SSD on flippers

	Pre-Policy Flippers' Holding Periods Before and After SSD							
	All Resales before SSD:		1 Year before SSD		During SSD **Phase 1**		1 year from SSD **Phase 2**	
Holding Period	Before Nov 19, 2010		Nov 20, 2009- Nov 19, 2010		Nov 20, 2010- Oct 27, 2012		Oct 27, 2012- Oct 26, 2013	
	%	Cum.%	%	Cum.%	%	Cum.%	%	Cum.%
0-1 year	**42.08%**	42.08%	**45.73%**	45.73%	0.55%	0.55%	0.39%	0.39%
1-2 years	**33.25%**	75.33%	**29.18%**	74.91%	**2.88%**	**3.43%**	0.64%	1.03%
2-2.5 years	1.71%	77.04%	1.87%	76.78%	**7.37%**	**10.80%**	0.67%	1.70%
2.5-3 years	1.50%	78.54%	1.02%	77.81%	4.44%	15.24%	**0.71%**	**2.41%**
3-3.5 years	1.33%	79.87%	0.55%	78.35%	3.90%	19.14%	**7.00%**	**9.41%**
3.5-4 years	1.09%	80.96%	0.69%	79.05%	3.14%	22.28%	4.70%	14.11%
over 4 years	19.04%	100%	20.95%	100%	**77.71%**	**100%**	**85.89%**	100%

Extension of Pre-Policy Flippers' Holding Periods due to Phase 1 SSD in 2010

- Regression analysis controlling for property features and other market variables, as these factors could affect the holding period of a unit.

$$\log(Holding\ Period_{it}) = \beta_1 SSD_{i,t_p} + X'_{it}\lambda + \gamma M_t + \varphi_i + \varepsilon_{it}$$

	(1)	(2)	(3)	(4)
		Subsample of Pre-policy Flippers		
Y: log (holding period in days)	All years	[-5, +5] years	[-2, +2] years	[-1, +1] year
SSD	**1.2438*** **	**1.2676*** **	**1.3162*** **	**1.3529*** **
	(0.0327)	**(0.0244)**	**(0.0279)**	**(0.0335)**
Physical Features	Y	Y	Y	Y
Prime Lending Rate	Y	Y	Y	Y
District Fixed Effect	Y	Y	Y	Y
Observations	292,696	93,322	47,356	25,039
R-squared	0.031	0.096	0.159	0.191

Impact of SSD on Flippers' Investment Activities: Do they quit property investment?

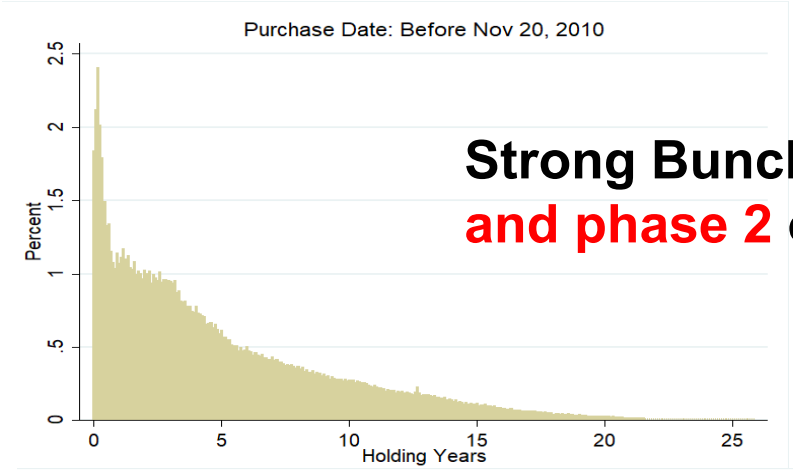
- Y=1 if pre-policy flippers make a property purchase
- Sample: All purchase activities of pre-policy flippers from 1992 to2017
- **Pre-policy flippers:** flippers (sellers with holding period <=2 years) before the SSD 2010

	(1)	(2)	(3)	(4)
	Dependent Variable: **PreFlip Buy Dummy**			
	All years	[-5, +5] years	[-2, +2] years	[-1, +1] year
SSD	-0.2048***	-0.2058***	-0.2115***	-0.1954***
	(0.0064)	(0.0076)	(0.0066)	(0.0076)
Physical Features	Y	Y	Y	Y
Prime Lending Rate	Y	Y	Y	Y
District Fixed Effect	Y	Y	Y	Y
Observations	1,556,528	596,040	303,538	160,314
Pseudo R-squared	0.0373	0.0688	0.0869	0.0854

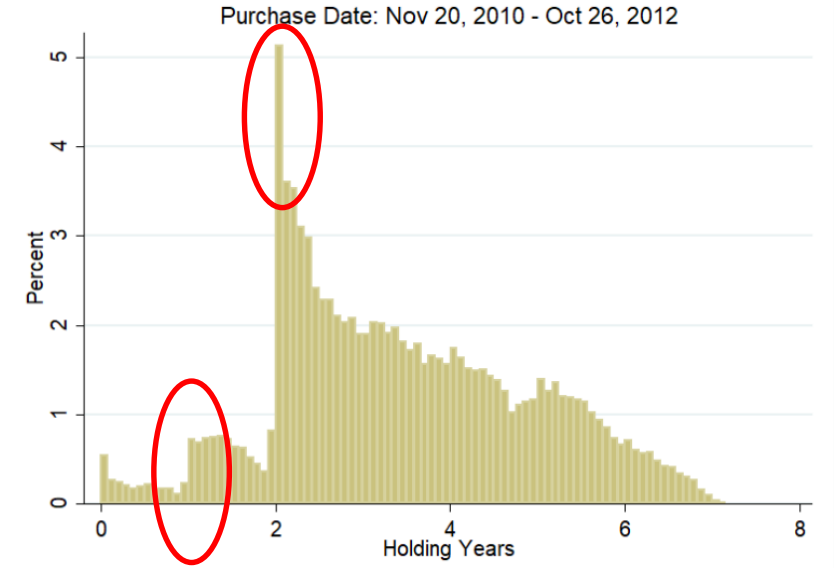
→ Likelihood of making home investment post-SSD drop by 20%.

Findings (3): Flippers' Strategic Responses to SSD

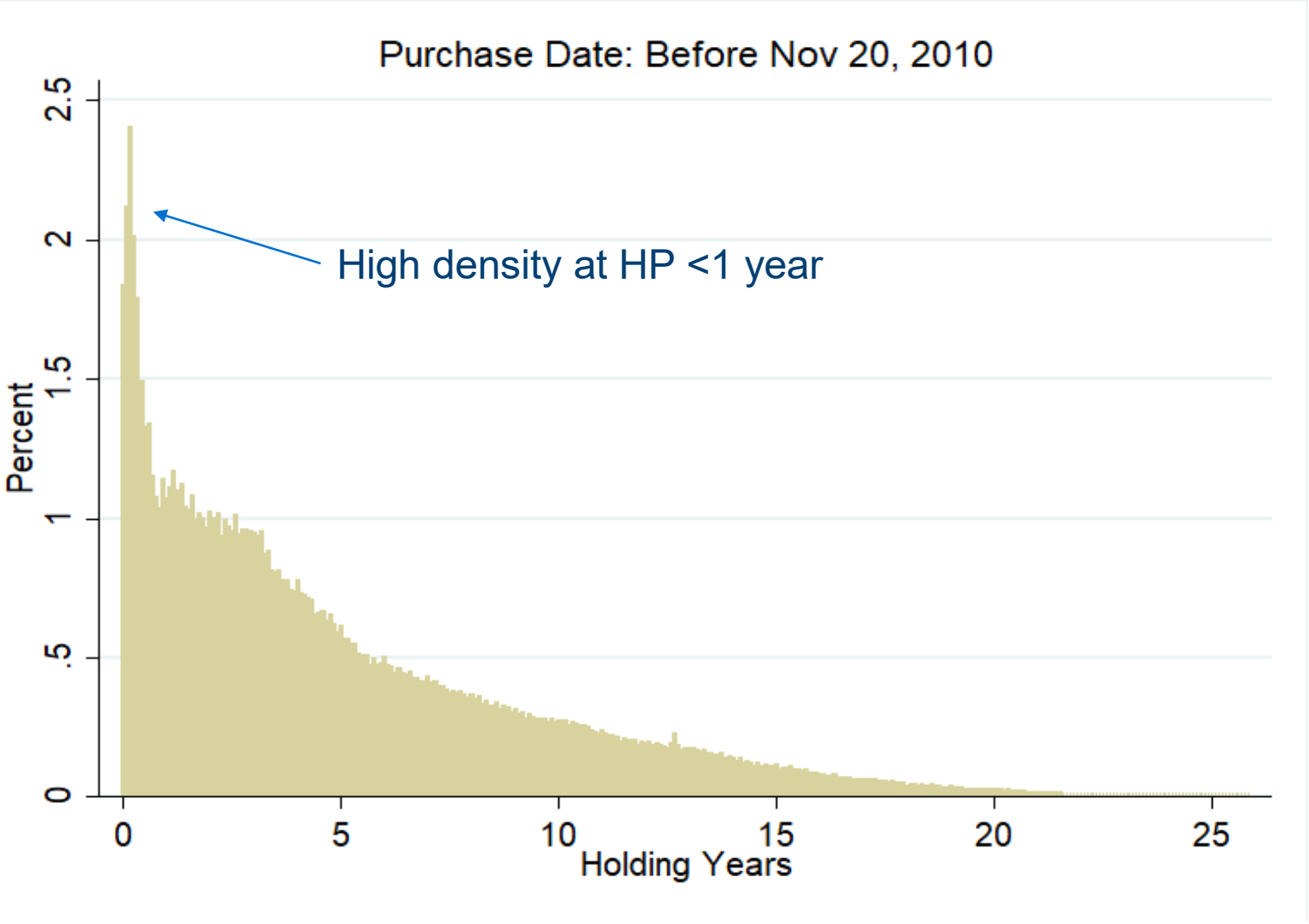
- Flippers **defer** home sales till the end of SSD lock-in period, then urgently sell the properties at a **discount**.



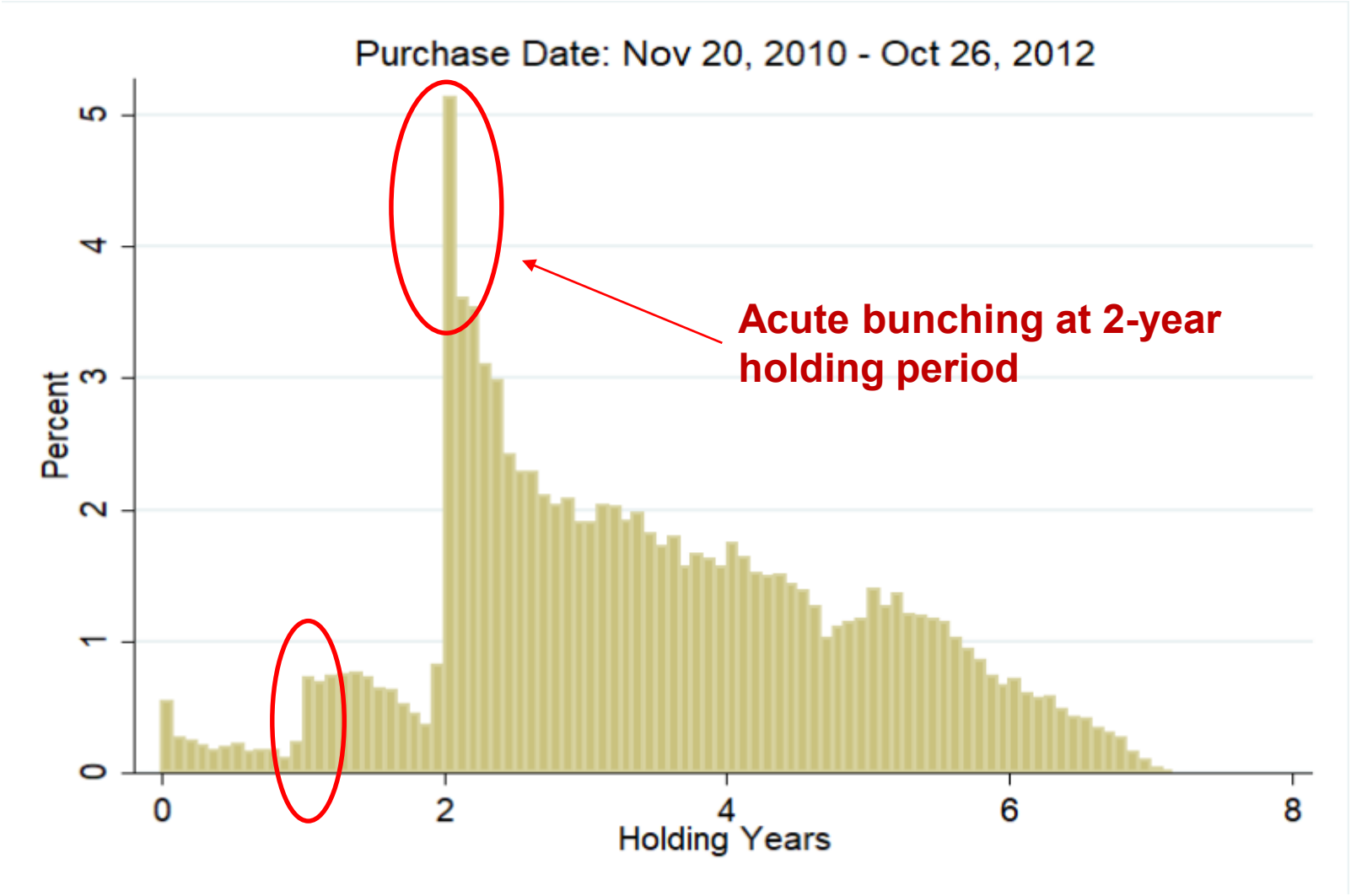
Strong Bunching effects observed only in phase 1 and phase 2 of SSD, not in the prior period



Flippers' Responses to SSD: Holding Period



SSD Phase 1: 5-15% tax within 2 years



SSD Phase 2: 10-20% tax within 3 years

Urgent Sales Bunching Effect

Probit Regression Sample: home sales with purchase dates falling within the [-2 years, +2 years] window around November 20, 2010 (the effective date of the SSD Phase 1), and holding period of up to 5 years.

$$Sell2Yr1Mth_{it} \text{ or } Sell2Yr3Mth_{it} = \beta_1 SSD_{i,t_p} + X'_{it}\lambda + \gamma M_t + \varphi_i + \varepsilon_{it}$$

	(1)	(2)	(3)	(4)
	Sell2Yr1Mth	*Sell2Yr3Mth*	*Sell3Yr1Mth*	*Sell3Yr3Mth*
Y=1 if Sell within X months after lock-in	1 month	3 months	1 month	3 months
Policy	SSD Phase 1 (2-year lock-in)		SSD Phase 2 (3-year lock-in)	
SSD Phase 1	0.0353***	0.0784***		
	(0.0018)	(0.0051)		
SSD Phase 2			0.0489***	0.1268***
			(0.0016)	(0.0033)
Sample	T_p in [-2,+2] years around SSD Phase 1, and $T_p \leq T_s \leq T_p + 5$ *years*		T_p in [-2,+2] years around SSD Phase 2, and $T_p \leq T_s \leq T_p + 5$ *years*	
Physical Features	Y	Y	Y	Y
Prime Lending Rate	Y	Y	Y	Y
District Fixed Effect	Y	Y	Y	Y
Observations	93,412	93,668	74,945	75,108
Pseudo R-squared	0.0453	0.0415	0.131	0.145

Robustness:
Urgent Sales Bunching of Pre-policy Flippers

- Using resales of pre-policy flippers only sample as robustness

$$Sell2Yr1Mth_{it} \text{ or } Sell2Yr3Mth_{it} = \beta_1 SSD_{i,t_p} + X'_{it}\lambda + \gamma M_t + \varphi_i + \varepsilon_{it}$$

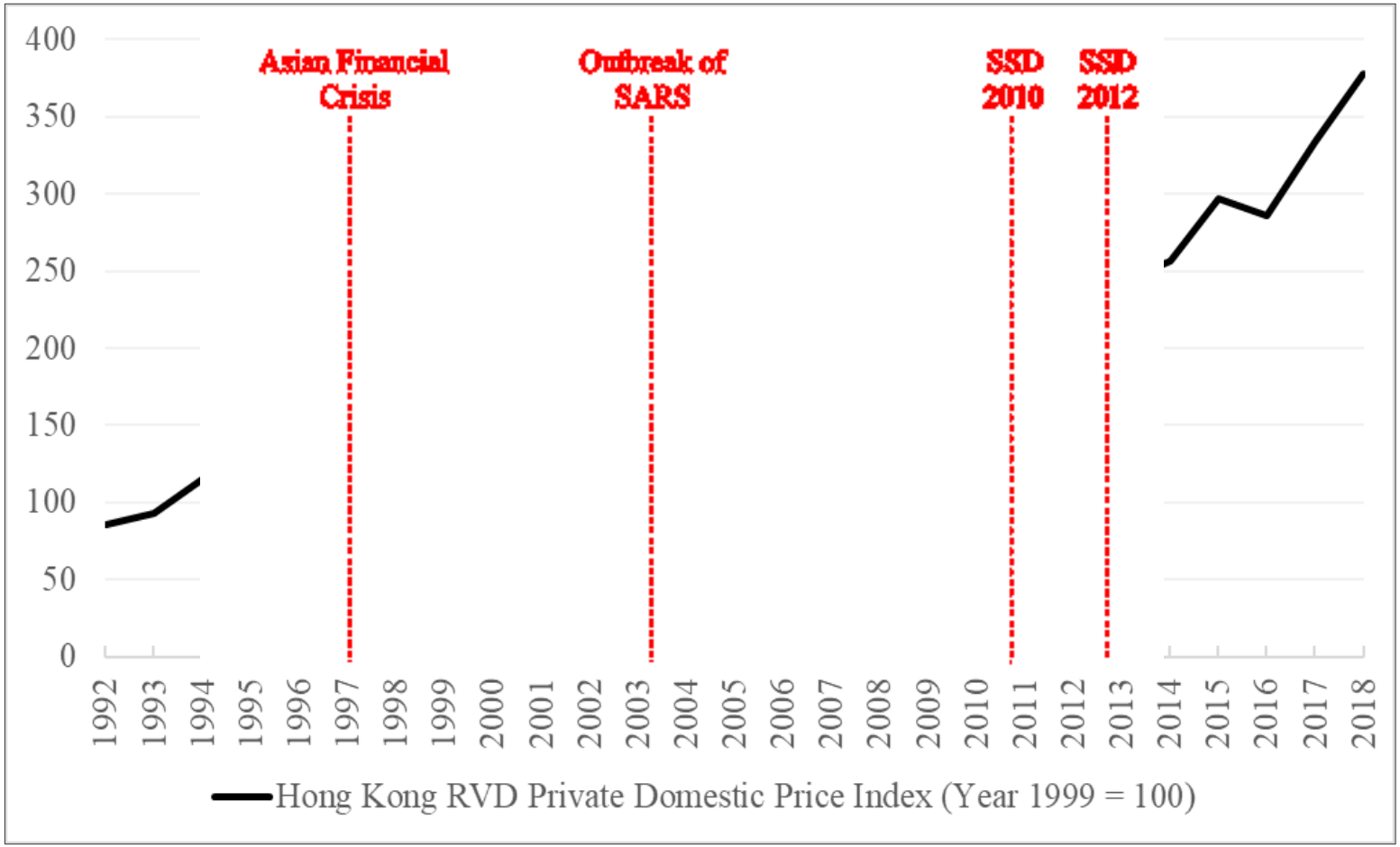
	(1)	(2)	(3)	(4)
	Sell2Yr1Mth	*Sell2Yr3Mth*	*Sell3Yr1Mth*	*Sell3Yr3Mth*
Y=1 if Sell within X months after lock-in	1 month	3 months	1 month	3 months
Policy	SSD Phase 1 (2-year lock-in)		SSD Phase 2 (3-year lock-in)	
SSD Phase 1	0.0230***	0.0523***		
	(0.0009)	(0.0013)		
SSD Phase 2			0.0192***	0.0442***
			(0.0005)	(0.0007)
Sample	T_p in [-2,+2] years around SSD Phase 1, $T_p \leq T_s \leq T_p + 5$ *years*		T_p in [-2,+2] years around SSD Phase 2, and $T_p \leq T_s \leq T_p + 5$ *years*	
Physical Features	Y	Y	Y	Y
Prime Lending Rate	Y	Y	Y	Y
District Fixed Effect	Y	Y	Y	Y
Observations	43,434	45,077	38,217	42,759
Pseudo R-squared	0.183	0.186	0.280	0.308

Summary of Findings (4): The Effectiveness of SSD in Cooling Down Market

- We find market price kept trending up despite SSD.
  - Housing price in the **primary** and **secondary** markets **increased** by **12.64%** and **15.76%**, respectively, in the [-1,+1] year window around SSD Phase 1.
  - Housing price in the **primary** and **secondary** markets **increased** by **26.6%** and **37.96%**, respectively, in the [-5, +5] year window around SSD Phase 1.

- Proposed Mechanisms:
  - SSD **reduces housing supply** in the secondary market, which drives up the price in secondary market.
  - Unmet demand in the secondary market flows to the primary market, drive up the price in primary market, given fixed supply in the primary market in the short to mid term.

Effectiveness of SSD Policy in Cooling Price



The market cooling effect is not so obvious.

Effectiveness of SSD Policy in Cooling the Market

- **Demand Spillover**
  - To avoid SSD tax, flippers extend their holding period, reducing the liquidity in secondary (or resale) market
  - Unmet demand flows to the primary market (fixed and scarce supply), driving up primary market price
  - SSD not effective in cooling down price

- **Examine the housing price and volume of the primary and secondary market separately**
  - Short-term : [-1 year, +1 year] Window
  - Long-term: [-5 years, +5 years] Window

Dynamics Between Primary and Secondary Markets: Price and Volume

$$\log(Price_{it})\ or\ Volume_{it} = \beta_1 Treat_{it} * Post_{it} + X'_{it}\lambda$$

- **Short-term Evidence: [-1 year, +1 year] Window**

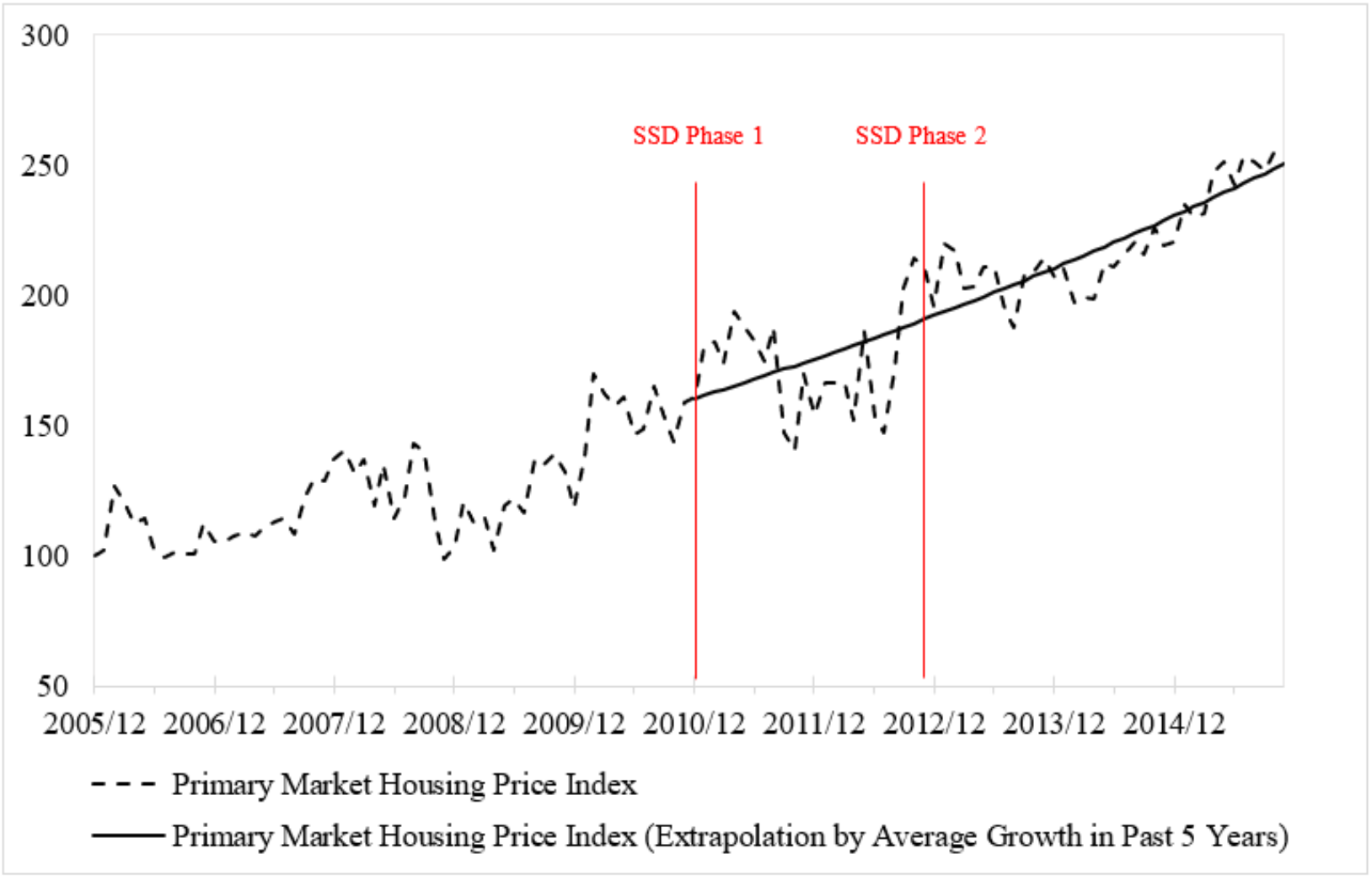
	(1) Primary	(2) Secondary	(3) Primary	(4) Secondary
[-1 year, +1 year]	Y: log (price)	log (price)	Transaction volume	Transaction volume
SSD	**0.1264*** **	**0.1576*** **	**-2.9761**	**-69.3467*** **
	(0.0430)	**(0.0046)**	**(2.9444)**	**(10.1662)**
Observations	17,712	142,594	1,399	1,399
R-squared	0.938	0.878	0.149	0.868

- **Long-term Evidence: [-5 years, +5 years] Window**

	(1) Primary	(2) Secondary	(3) Primary	(4) Secondary
[-5 years, +5 years]	log (price)	log (price)	transaction volume	transaction volume
SSD	**0.2660*** **	**0.3796*** **	**3.1609**	**-73.2609*** **
	(0.0630)	**(0.0157)**	**(2.4688)**	**(9.8110)**
Observations	73,353	522,675	7,014	7,014
R-squared	0.921	0.882	0.102	0.782

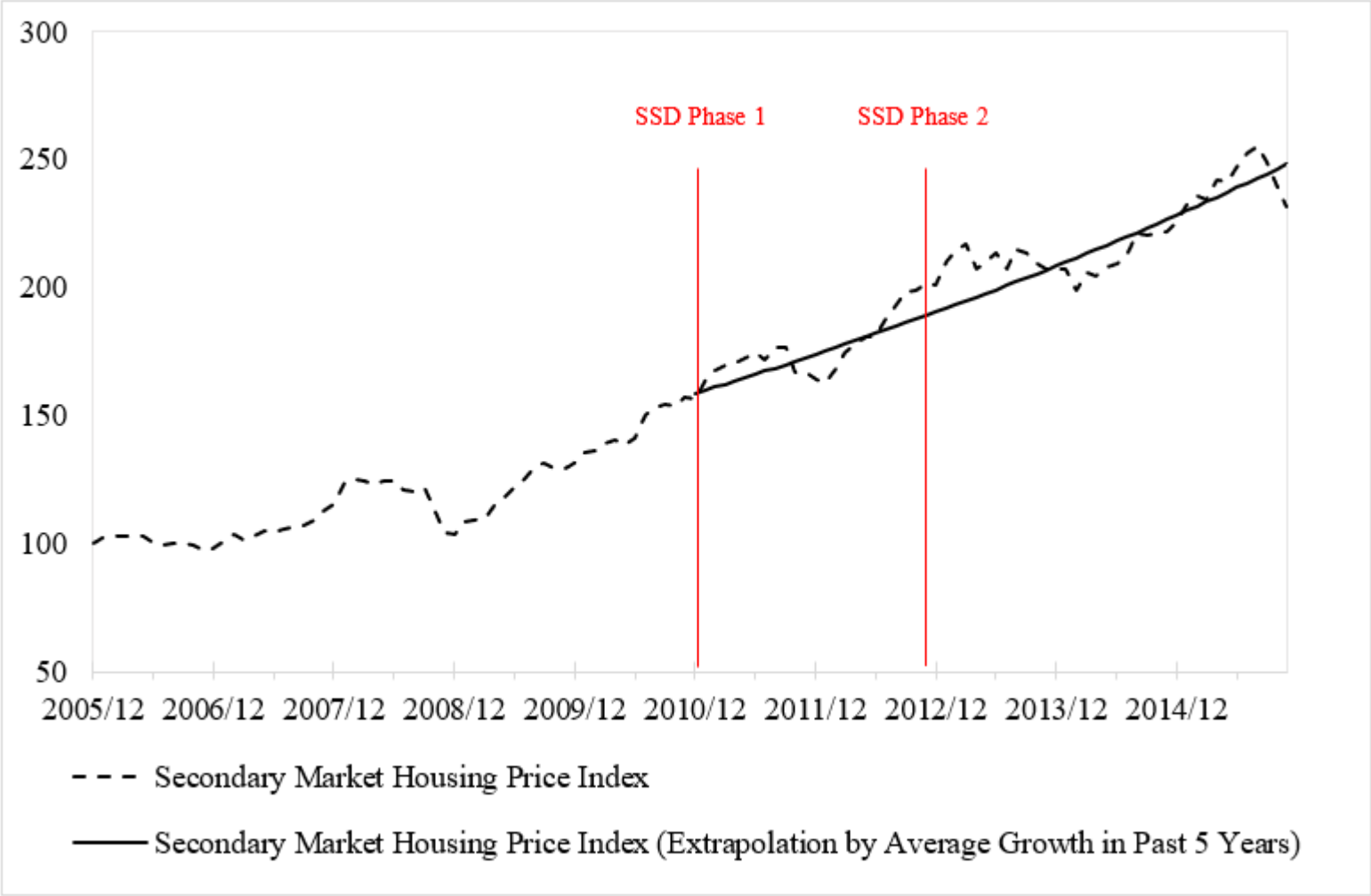
Counterfactual Housing Price Index if no SSD

Panel A. Primary Market



Counterfactual Housing Price Index if no SSD

Panel B. Secondary Market



Conclusion

- SSD effectively reduced short-term flipping sales in Hong Kong, but market price still went up instead of cooling down
- SSD effectively increased selling costs, prolonged potential sellers' holding period,
- Flippers deferred sales until the lock-in period ended, then urgently sold the properties at a discount.
- Supply from the secondary market dried up and homebuyers were crowded into the primary market.