Cross-market Spillovers of Real Estate Speculation

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Abstract

This study examines the externality of anti-speculation policies and its impact on property market volatility. Employing a rich dataset on property transactions in Hong Kong from 1991 to 2020, we find that, given regulations for flippers in the presale residential property market only, the flippers will flow into the spot residential property market. After implementing the presale-specific anti-speculation policies in 1994, the share of flipping transactions in the spot residential property market increased by 7.68 percentage points more than before the policy. With buyers' fixed effects, we find that existing flippers in the presale residential property market are 11.92 percentage points more likely to speculate in the spot residential property market thereafter. After the anti-speculation policies extend to the entire residential property market in 2010, there is no evidence demonstrating that the significant cross-market flipper spillover continues to the non-residential property market. Also, in the spot residential property market that flippers spill over into after 1994, the price volatility decreased by 1.56 percentage points, implying the price stabilizing effect of flippers. These findings shed lights on the importance of considering cross-market spillovers in regulating speculations in real estate markets.

Keywords: Spillover effect, Government policy, Housing speculation

JEL Codes: R30, R33, R38

1. Introduction

The presales of flats have been well developed in the Hong Kong housing market. In general, presale transactions account for 21.4% of the total transactions in the Hong Kong housing market. Various reasons explain for the popularity of presales in Hong Kong. For developers, they presell unfinished flats to homebuyers so as to shift their financial risk to customers (Chau, Wong and Yiu, 2003). For homebuyers, they lock the housing price and hedge against price appreciation in the future. The cost of locking the price is relatively low, as homebuyers can choose to pay the deposits only (typically 5-10% of the contract price) during the construction period and will not start to pay mortgage loans until the construction period ends. Also, developers provide higher loan-to-value ratios (LTV) to homebuyers for presale flats than for second-hand flats. In addition, there are more choices for homebuyers in the presale market, e.g., layout, building direction, floor, etc.

Prior literature has already explored the relationship between the presale property and the spot property market. Presale flats served a price discovery function for the spot flats and stabilized spot prices (Chau, Wong and Yiu, 2003; Wong, Yiu, Tse and Chau, 2006). When the presale property market is less active than the spot property market, the spot return Granger causes the presale returns (Yiu, Hui and Wong, 2005). However, most of these studies focus on the normal price dynamics without specific market regulations and limited attention has been paid to the externality of government policies specific to one market segment. This research gap is particularly important because the Hong Kong government has essentially relied on it macroprudential housing polices to cool the overheated market and to resolve the issue of affordability in the city. This study highlights the importance of considering cross-market spillovers in regulating speculations in real estate markets.

In addition, past literature also shows no consensus on the role of flippers on housing market dynamics. In real estate study, Chinco and Mayer (2015) argue that flippers may cause mispricing in housing market. Other papers hold different views. Bayer, Geissler, Mangum and Roberts (2021) indicate that flippers improve liquidity and the existing capital stock in the process. Fu, Qian and Yeung (2016) conclude that the increased in transaction tax in Singapore's presale residential property market results in increased price volatility in the presale residential property market. However, these studies focus on the changes in the same markets that the anti-speculation policies apply to, which

makes it challenging to differentiate the impact of flippers from other policy effects. In contrast, our study investigates the changes in the markets that flippers spill over into, which tests the role of flippers clearly and avoid other invisible noise.

To bridge these knowledge gaps, this study examines the externality of anti-speculation policies specifically applied for the presale residential property market only, as well as the impact of these policies when the scope of them expands from the presale residential property market to the entire residential property market. The Hong Kong residential property market serves an ideal institutional setting, because there were a rich series of cooling measures targeting at curbing speculations but with different scopes of application. On June 8th 1994, the Hong Kong government restricted speculations in the presale residential property market by reducing uncompleted flats' quotas for private sales, modifying the allowed preselling period from two years to nine months, and raising the required minimum deposit from 5% to 10% (denoted as "Policy 1994" hereafter). On November 20th 2010, the scope of policy interventions targeting at curbing speculations expanded from the presale residential property market to the entire residential property market. Specifically, the government announced that all flats purchased in Hong Kong would be levied with special stamp duty (denoted as "SSD" hereafter) of 5-15% if buyers resell the properties within two years. We use the implementation of Policy 1994 and SSD as two quasi-natural experiments in this study.

Existing literature has provided different definitions for speculators in different real estate market sectors. Following Fu, Qian and Yeung (2016), we define flippers buyers in the presale property market as buyers who buy the property before the completion date and resell it before project completion. This is because flipper buyers in the presale property market intend to resell the property before the construction period ends, otherwise their holding costs will increase significantly upon project completion. There will be management fees and maintenance fees once the project completes. In contrast, we define flippers buyers in the spot property market as buyers who hold the property for less than two years, following Bayer, Geissler, Mangum and Roberts (2020). This definition also aligns with the 2-year lock-in period that the Hong Kong government introduced in the SSD policy.

Employing the full property transactions in Hong Kong from 1991 to 2020, we first examine the impacts of these two policy shocks on the share of flipping transaction in the target market sectors,

which helps to reveal the effectiveness of these policies in reducing flipping transactions in the target market sectors. Second, we examine the impacts of these policies on the share of flipping transactions in other related markets, which helps to reveal the impacts of these two policies on redistributing flippers across the market sectors. Third, at the individual level, we investigate the post-treatment cross-market movements of existing flippers in the policy's original target market sectors. This provides a better identification of flippers' cross-market spillovers due to investment restricts in certain market sectors. Last, we explore the changes of price volatility after the policies in order to investigate the role of flippers in the real estate market.

We document the following key findings. First, to lay the foundation of the spillover analysis, we first investment the impacts of these two policy shocks on reducing the share of flipping transaction in the target market sectors (i.e., flippers leave the policy's target markets). After Policy 1994, the share of flipping transaction number in the presale residential property market at the building-month level is 1.51 percentage points less than before the policy. After SSD, the share of flipping transaction number in the entire residential property market at the building-month level is 14.86 percentage points less than before the policy, consistent with the results in similar studies on the SSD (Agarwal et al, 2022). The results are robust if we use the share of transaction amount of flippers, or if we compare the absolute number (or amount) of transactions made by flippers in relative to that of non-flippers at the building-month level.

Second, we examine the policy impact on redistributing flippers across the market sectors. Policy 1994 only applies to the flippers in the presale residential property market, while flippers in the spot residential property market are not restricted. Using this shock of Policy 1994, we find that the share of flipping transaction number in the spot residential property market at the building-month level increased by 7.68 percentage points more than before the policy. This result demonstrates the impacts of presale-specific anti-speculation policies on redistributing flippers across the presale residential property market and the spot residential property market. Under the same logic, SSD is only applicable to speculative transactions in the residential property market. The speculative transactions are not restricted in the non-residential property market after SSD. We examine the impacts of SSD on the share of flipping transactions in the retail property, industrial property and office market separately.

We find that the share of flipping transactions in the non-residential property market didn't change significantly after SSD.

Third, at the individual level, we investigate the post-treatment cross-market movements of existing flippers in each policy's original target market sector. We find that, after Policy 1994, existing flippers in the presale residential property market are 11.92 percentage points more likely to speculate in the spot residential property market. These results confirm that flipper spillover effect exists after curbing speculations in the presale residential property market. Flippers are likely to flow into the spot residential property market after curbing speculations in the presale residential property market. We further investigate the cross-market movements of existing flippers in the residential property market after SSD to test whether the flipper spillover effect could continue when the scope of the policies expands from the presale residential property market to the entire residential property market. There is no strong evidence demonstrating that flippers in the residential property market will flow into the non-residential property market significantly after SSD, probably because the non-residential properties are not comparable speculation targets to the residential properties.

Finally, after showing flippers flowing into the spot residential property market after Policy 1994, we further explore the changes of price volatility in the spot residential property market to investigate the role of flippers in the real estate market. Following Fu, Qian and Yeung (2016), we use the difference between the highest and lowest residuals applying the hedonic models at the building-month level to measure price volatility. On average, the price volatility in the spot residential property market at the building-month level decreased by 1.56 percentage points after Policy 1994. These results show the evidence that flipper buyers stabilize the housing price and decrease price volatility in the real estate market. Fu, Qian and Yeung (2016) document that presale-specific policies targeting at curbing speculations in Singapore reduced speculative transactions by 75% in the presale residential property market and increased its price volatility by 18%. Our study corroborates the literature on this view but under a cleaner setting. Specifically, Fu, Qian and Yeung (2016) examined the changes of price volatility in the same markets that the anti-speculation polices apply to, assuming that "the policy aims to slow price appreciation only and is arguably exogenous to price volatility". In contrast, our study relaxes this assumption: we investigate the changes of price volatility in the spot residential property

market that flippers spill over into after policies. The spot residential property market is not directly restricted by the presale-specific policies, so the changes in the spot residential property market volatility during that time window are assumed to be mainly driven by the increased share of flipper buyers in the spot residential property market. This design setting can better test the role of flippers in the real estate market and avoid other invisible noise.

The contributions of this study are twofold. First, this study examines the externality of anti-speculation policies under a series of unique policy shocks in Hong Kong real estate market. It concludes that the cross-market flipper spillover exists when the anti-speculation policies solely target at the presale residential property market but not at the entire residential property market. It adds to the literature on cross-market speculative spillover in other more liquid financial assets due to anti-speculation policies, such as the stock and warrant markets (Cai, He, Jiang, Xiong 2021). This study sheds lights on the importance of considering the cross-market movement when regulating speculations in real estate markets.

Second, this study contributes to the debate on the role of flippers in the real estate market through a well-designed framework. Using the changes in a market sector which is not directly affected by policy shocks but have flippers spilling over from other market sectors, it provides a clean identification for the role of flippers in the real estate market. Prior literature presents mixed evidence on the role of flippers in both the financial and the real estate market. A lot of literature concludes that flippers decrease price stability and increase price volatility (Tobin 1978; Stiglitz 1989; Summers and Summers 1989). On the contrary, Umlauf (1993) indicates that in the 1980s, after enacting a new transaction tax, the price volatility of Swedish Stock market did not decline. Other more recent studies present similar findings but under different research frameworks (e.g., Chou and Wang 2006; Su and Zheng 2011; Fu, Qian and Yeung 2016). They indicate that flippers can stabilize market price and decrease price volatility. Our study extends the literature by supporting the latter view with evidence from the real estate market.

The rest of the paper is organized as follows. Section 2 introduces the institutional background and Section 3 summarizes the literature review related to the study. Section 4 describes the data and measures used. Section 5 presents the main empirical results of cross-market speculation after the

policies. Section 6 discusses the impact of cross-market spillovers of flippers on housing price volatility. Section 7 presents the robustness tests of this study. Section 8 concludes this paper.

2. Institutional Background

Hong Kong is now regarded as the most expensive city to live in globally (Carozzi, Cheshire and Hilber, 2018). Based on the Demographia International Housing Affordability Survey 2021 edition, Hong Kong ranked the 1st least affordable metropolitan market around the world with a median multiple[1] of 20.7 in 2021, almost four times the threshold[2] of the definition "severely unaffordable". A median multiple of 20.7 represents that a Hong Kong family with a median annual household income takes 20.7 years in order to buy a property valued at an average market price.

Presale flats have been well developed in the Hong Kong housing market. Back to 1954, the marketing strategy of 'pre-sale' was first created by Dr Henry Fok in Hong Kong. In the 1950s, ordinary citizens in Hong Kong did not have the sense of owning a property. The deals of properties were mainly whole-building transactions or land deeds at that time. A five-story building usually cost more than HKD 100,000, which was far beyond ordinary residents' income at that time. The creations of 'splitting a whole building into several flats', 'installment payment' and 'pre-sale' solve the dilemma between the high requirement for owning a property and low household income, enabling ordinary residents to own their flats. Presale transaction accounts for 21.4% of the total housing transactions, suggesting that the presale property market takes a crucial place in the Hong Kong housing market.

Presale transactions could be regarded as forward contracts. Transaction parties have agreed on the housing price at the time of purchase but the flat, which is still not completed, is transferred to homebuyers only after construction period ends (Chau, Wong and Yiu, 2003). Currently, two methods of payment are available when buying presale flats in Hong Kong. On one hand, buyers can pay deposit

[1] The median multiple is the ratio of median home price to the median annual household income.

[2] The international standard for unaffordable housing price is reached when the median multiple exceeds 5.5.

under the construction period only and start to pay mortgage loans once the construction period ends. On the other hand, while the building is still under construction, buyers can start paying mortgage loans as soon as homebuyers sign the Agreement of Sale & Purchase (ASP). The advantage for paying mortgage loans under construction period is that buyers may enjoy more discounts from developers. However, under this payment method, it may increase homebuyers' expenditure and affect his or her capital turnover if he or she is still under other mortgages or needs to pay housing rent. Flipper buyers, whose trading activities are motivated by short-term capital gains, tend to choose the first payment method: only pay deposit under the construction period, for flippers try to minimize upfront cost and seek end-users during the building construction period.

Due to the features of presale flats: low upfront cost, low holding cost (no management fees, no maintenance fees, etc.) and high liquidity, presale flats are more attractive to flippers. That is why regulators first curb speculations in the presale property market. However, according to our transaction data, we find that on average, flippers in the spot residential property market account for approximately 13.3% of all spot flats' transactions. In comparison, flippers in the presale residential property market account for only 11.4% of all presale flats' transactions. The shares of flippers in each property market sectors in Hong Kong from 1992 to 2020 are presented in Figure 1.

[INSERT FIGURE 1 ABOUT HERE]

Why there are more flippers in the spot residential property market in reality? It does not contradict with our argument that presale flats are more attractive to flippers. Due to the limited supply of presale flats in Hong Kong, developers mainly choose 'luck draw' or 'first come, first served' methods to arrange potential buyers. According to the result of 'luck draw', buyers pick their dream flats from available choices in sequence. It is common to see that high-quality flats (good direction, higher floor and well-designed layout) are picked by potential buyers quickly. The 'luck draw' picking system involves random selection mechanism to maintain fairness. Under this system, flippers are difficult to pick high-quality flats and thus make limited deals, for flippers have high requirements about property layout, direction, housing size and floor in order to create a profitable deal and are not willing to compromise easily for living.

Facing with high-rising housing price, Hong Kong government has enacted a series of anti-speculation policies to cool down the housing market. In early years, these kinds of policies are mainly implemented in the presale residential property market, including both supply-side restrictions and demand-side restrictions. On June 8th 1994, facing with the fast-growing housing price, the Hong Kong government formed a task force to cool down the overheated housing market. After a lot of preparatory work, the task force indicated that the presale residential property market should be first controlled because the presale residential property market was conductive to speculations. The Hong Kong government enacted the following measures: 1) The government restricted the quota allocated to private sale from 50% to 10% of the unfinished flats. 2) The government prohibited any re-sale transactions of ASP before the Certificate of Compliance, or the consent-to-assign was provided. 3) Uncompleted flats can be sold only at most 9 months before building completions. Before enacting this policy, developers had been admitted preselling uncompleted flats up to two-year before building completions. 4) Instead of a 5% deposit, homebuyers must pay a 10% deposit for buying presale flats. If transactions are cancelled, a 5% fee will be charged. Details of the Policy 1994 are presented in Figure 2.

[INSERT FIGURE 2 ABOUT HERE]

After a few years, facing with a depressed housing market following the Asian financial crisis in 1997, in June 1998, the Hong Kong government partially relaxed the constraints imposed in June 1994: 1) The government increased the quota allocated to private sale from 10% to 20% of the unfinished flats. 2) The government paused the sub-sale restriction on unfinished flats. 3) The permitted period that uncompleted flats can be sold extends to 15 months. 4) The government reduced the amount of deposit from 10% to 5% for buying presale flats.

Ten years later in 2010, the Hong Kong government implemented more stringent anti-speculation measures to cool down the continuous housing price appreciation in Hong Kong since the market recovered from the SARS in 2003. The scope of policy interventions expanded from the presale residential property market to the entire residential property market. On November 20th 2010, it was announced that all residential properties purchased in Hong Kong would be levied with special stamp duty of 5-15% if the buyers resell the units within two years: 1) All residential properties purchased

from then on would be levied a special stamp duty (SSD) of 15% if property owners sold their properties within 6 months of purchase. 2) All residential properties purchased from then on would be levied a special stamp duty (SSD) of 10% if property owners sold their properties within 6 to 12 months of purchase. 3) All residential properties purchased from then on would be levied a special stamp duty (SSD) of 5% if property owners sold their properties within one to two years of purchase. Two years later, on October 26th 2012, the government further extended the SSD taxable period to three years and increased the tax to 10% – 20%. In this study, we mainly use the implementation of Policy 1994 and the initial introduction of Special Stamp Duty in 2010 as two quasi-natural experiments.

3. Literature Review

Prior literature has already investigated the development of the presale property market from different perspectives. Leung, Hui and Seabrooke (2007) study the information asymmetric problem in the presale property market and indicate a series of perspectives that are crucial to the development of the presale property market. Chau, Wong, Yiu (2007) document that the reputation of developers has already capitalized into the housing prices of presale flats, and the best way for developers is to stick to the quality of these presale flats in order to avoid moral hazard problem. Lai, Wang and Zhou (2004) model a presale decision in real-options framework and indicated that presale flats are mainly for a risk-sharing purpose. Gan, Hu and Wan (2021) investigate potential determinants of contracts rescission from option theory in the presale property market.

The relationships between sub-markets have also been investigated in prior literature. Some literature focus on the relationship between the presale property market and the spot property market. Leung, Hui and Seabrooke (2007) indicate that relative price changes in the presale property market track closely to that in the spot property market. Chau, Wong and Yiu (2003) document that the presale property market provides a price discovery function for the spot property market. Wong, Yiu, Tse and Chau (2006) conclude that the presale property market stabilizes the housing price in the spot property market. Other papers document that the spot property market also has impacts on the presale property market. Yiu, Hui and Wong (2005) document that when the presale property market is less active than

the spot property market, the spot return Granger causes the presale returns. Other literature focus on the relationship between the residential property market and the commercial property market. Rosen (1979) and Roback (1982) document that the prices of residential and commercial properties will move together if local productivity or amenity changes, for land is substitutable on the margin between different uses. Gyourko (2009) document that more similarities than differences across the residential property market and the commercial property market. The correlation between price appreciation rates on the residential property market and the commercial property market is between 40% and 60%. This study extends the literature on the relationship between the presale residential property market and the spot residential property market from the cross-market flipper spillover perspective. Policy makers should consider the cross-market flipper spillovers when regulating speculations.

Prior literature mainly investigated the cross-market speculations in financial study. Ma (2019) documented that firms use one type of security to replace another in response to shifts in relative valuations. Cai, He, Jiang, Xiong (2021) documented that anti-speculation activities in stock market will cause trading frenzy in warrant market. However, limited attention has been paid to the cross-market speculations in real estate market.

Prior literature shows no consensus on the role of flippers. In financial study, some literature argued that flippers decrease price stability and increase price volatility (Tobin 1978; Stiglitz 1989; Summers and Summers 1989). But some recent papers show different stories. Chou and Wang (2006) documented that after the reduction in the transaction tax, trading volume increase, bid-ask spreads decrease, and price volatility decrease. Su and Zheng (2011) indicate that both increases and reductions in transaction tax in A-share market in mainland China will result in increases in market volatility.

Similar debates exist in real estate study. Chinco and Mayer (2015) argue that flippers may cause mispricing in housing market. Other papers hold different views. Bayer, Geissler, Mangum and Roberts (2021) indicate that flippers improve liquidity and the existing capital stock in the process. Fu, Qian and Yeung (2016) conclude that the increased in transaction tax in Singapore's presale residential property market results in increased price volatility in the presale residential property market. Leung and Tse analyze that the role of flippers depends on the market condition. Flipping transactions tend

to be socially beneficial in a sluggish and illiquid market, while tend to be wasteful in a tight and liquid market.

4. Data and Sample

4.1 Summary Statistics

We mainly utilize EPRC property transaction dataset in Hong Kong from 1991 to 2020 for the empirical analysis. EPRC property transaction dataset consists of property transactions and presents comprehensive information on housing characteristics and transaction details, such as transaction date, transaction price, buyers' name and sellers' name, property address, building age, floor level, salable floor area, number of rooms, the property type (e.g., residential properties, offices, retail properties, industrial properties).

For those properties transacted for multiple times during our sample period, the consecutive transactions are also calculated. For each transaction, we also adjust the transaction price using published monthly Consumer Price Index (CPI) to remove the effect from inflation (the base is October 2014). Detailed definitions are described in Appendix Table A1.

Presale transactions and spot transactions can be distinguished by comparing the building completion date with property transaction date (i.e., when the property transaction date is before its building completion date, we recognize it as a presale transaction). Following Fu, Qian and Yeung (2016), we define flippers buyers in the presale property market as buyers who buy the property in the presale property market and resell it before project completion, for flipper buyers in the presale property market intend to resell the property before the building completions, and holding costs increase significantly upon building completions. Following Bayer, Geissler, Mangum and Roberts (2021), we define flipper buyers in the spot property market as buyers who hold the property for less than two years.

Table 1 presents summary statistics of variables. In the overall residential property market, a median transaction is located on the 14^{th} floor and is a night-year old property, with the cost of HKD 3.350 million and a size of 47.566 square meters. Price per square meter displays a large variation,

with the 25th percentile being HKD 49.613 thousand and the 75th percentile being HKD 102.559 thousand. The mean of Urban_Dummy in residential property samples is 0.474, which means that nearly a half of residential property transactions are urban flat transactions. The mean of Flipper_Dummy is 0.129, which means that there are 12.9% speculative transactions among all residential property transactions. The mean of Presale_Dummy is 0.214, which means that there are 21.4% presale transactions among all residential property transactions.

For the non-residential property samples, a median transaction is located on the 8th floor and is a sixteen-year old property, with the cost of HKD 2.581 million and a size of 60.572 square meters. The mean of Urban_Dummy is 0.608, which means that more than a half of the non-residential property transactions are in urban area. The mean of Flipper_Dummy is 0.145, which means that there are 14.5% speculative transactions among all non-residential property transactions. The mean of Presale_Dummy is 0.101, which means that there are 10.1% presale transactions among all non-residential property transactions.

[INSERT TABLE 1 ABOUT HERE]

4.2 Univariate Analysis

In Appendix Table A2, we first examine the differences in transaction characteristics between presale flats and spot flats and between the residential and the non-residential properties. Appendix Table A2 reports the number of samples and variable means in each group, and the mean differences are presented with t-test statistics.

On average, presale flats are larger (55.155 vs 52.344 square meters), more expensive (HKD 97.322 vs 79.501 thousand per square meter) and on the higher floor (20.786 floor vs 15.689 floor). The main reason behind why presale flats are more expensive is that presale transactions can be understood as forward contracts and developers set pricing in consideration of future housing appreciation. 38.8% of presale transactions are in urban areas, while the mean of spot transactions is 49.7%. This reveals that presale flats located in suburban areas have more transactions, potentially caused by new completions mainly located in suburban areas. 11.4% of presale flat transactions are

speculative transactions, while the mean of spot flat transactions is 13.3%. This result is consistent with what we have already discussed in the institutional background part.

Compared to the non-residential properties, residential properties are smaller (52.946 vs 96.171 square meters), relatively cheaper (HKD 83.317 vs 89.665 thousand per square meter), on the higher floor (16.780 floor vs 9.112 floor) and younger (11.899 vs 15.994 years old). 47.4% of residential property transactions are in urban areas, while 60.8% of the non-residential property transactions are in urban areas. This reveals that location is much more important for the non-residential property markets. 12.9% of residential property transactions are speculative transactions, which is a little bit lower than the proportion of the non-residential property transactions. 21.4% of residential property transactions are presale transactions, while only 10.1% of the non-residential property transactions are presale transactions. It suggests that pre-sale is more common in the residential property market, comparing to the non-residential property market.

5. Main Results

Our empirical analysis includes several steps. First, we examine the impacts of these two policy shocks on the share of flipping transactions in the target market sectors, which helps to reveal the effectiveness of these policies in reducing flipping transactions in the target market sectors (Section 5.1). We show that flippers leave the policy's target market, which lays the foundation for the spillover analysis. Second, we document the overall magnitudes of the cross-market spillover effect, by investigating the changes in the share of flipping transactions in the non-target property markets after the two policy shocks (Section 5.2). This analysis reveals the impacts of these two policies on redistributing flippers across the market sectors. Third, as the identification strategy, we investigate the post-treatment cross-market movements of existing flippers in target market sector of each policy, using buyers' fixed effects (Section 5.3). We examine whether the flippers, who used to speculate in the target market sector, enter and speculator in the non-target market sector after the policy shocks.

5.1 Policy Impact on Reducing Flipping Transactions

5.1.1 Policy 1994

We first examine the policy impact on the share of flipping transactions in the presale residential property market at the building-month level to reveal the effectiveness of Policy 1994 in reducing speculative transactions in the target market sector. We use following empirical specifications:

$$Share\ of\ flip\ number_{it} = \alpha + \beta_1 Policy_{1994} + \gamma P_t + \omega_i + \varepsilon_{it}, \quad \text{---(1)}$$

$$Share\ of\ flip\ amount_{it} = \alpha + \beta_1 Policy_{1994} + \gamma P_t + \omega_i + \varepsilon_{it}. \quad \text{---(2)}$$

The dependent variables $Share\ of\ flip\ number_{it}$ and $Share\ of\ flip\ amount_{it}$ are defined as the share of flipping transaction number and transaction amount in building *i* during month *t*, respectively. The independent variable of interest, $Policy_{1994}$, is a dummy variable equal to 1 for the building-month observations after enacting Policy 1994 (0 otherwise). We choose building-month observations within the [-1 year, +1 year] window surround the Policy 1994 to identify the shorter-term effect, and the [-2 years, +2 years] window to identify the longer-term effect. Therefore, the coefficient β_1 represents the changes in the share of flipping transactions in the presale residential property market at the building-month level after enacting the Policy 1994. In this specification, we cannot control for the time fixed effect, which will otherwise result in an unreliable estimate of β_1, but we explicitly control the quarterly price index in the Hong Kong housing market (P_t) to capture the impact of time-variant market dynamics on flipping activities.[3] ω_i represents the district fixed effects.[4] ε_{it} denotes the error term. Standard errors are clustered at the district level.

The results are presented in Panel A of Table 2. We find that after enacting Policy 1994, the share of flipping transactions in the presale residential property market decreased significantly. After the Policy 1994 takes effect, the share of flipping transaction number in the presale residential property market at the building-month level is 1.34 percentage points (Column (1)) and 1.51 percentage points (Column (2)) less than that before the policy, using [-1 year, +1 year] and [-2 years, +2 years] window,

[3] As a robustness check, we also compare the changes in absolute transaction number (or amount) by flippers in relative to that of non-flippers at building-month level, with the control of time-fixed effects. Details are presented in Section 7.

[4] There are 60 districts in total, as assigned by the EPRC. Details are presented in Appendix Table A1.

respectively. We find similar results when using the share of flipping transaction amount as the outcome variable, as reported in Column (3) and Column (4). These results show that Policy 1994 is effective in reducing the flipping transactions in the policy's target market sector —the presale residential property market.

[INSERT TABLE 2 ABOUT HERE]

5.1.2 Special Stamp Duty

Using the same empirical methodology, we then examine the effectiveness of SSD 2010 in reducing speculative transactions in the entire residential property market. Specifically, we revise our empirical models as follows:

$$Share\ of\ flip\ number_{it} = \alpha + \beta_1 Policy_{SSD} + \gamma P_t + \omega_i + \varepsilon_{it}, \quad \text{---(3)}$$

$$Share\ of\ flip\ amount_{it} = \alpha + \beta_1 Policy_{SSD} + \gamma P_t + \omega_i + \varepsilon_{it}. \quad \text{---(4)}$$

The independent variable of interest, $Policy_{SSD}$, is a dummy variable equal to 1 for the building-month observations after enacting SSD 2010 (0 otherwise). Definitions of the other variables remain unchanged. The coefficient β_1 measures changes of share of flipping transactions in the entire residential property market at the building-month level after the SSD 2010. Same to the analysis of Policy 1994, we include observations within the [-1 year, +1 year] or [-2 years, +2 years] window surround the SSD 2010 in the regressions, and the standard errors are clustered at the district level.

We report the corresponding results in Panel B of Table 2. We find that after the SSD 2010, the share of flipping transaction number in the entire residential property market decreases by 14.20 percentage points (Column (1)) within 1 year, and 14.86 percentage points (Column (2)) within 2 years. The share of flipping transaction amount in Column (3) and Column (4) show similar and robust results. This result implies that the SSD enacted in November 2010 is effective to reducing the number of flippers who resale within 2 years in the entire residential property market.[5]

[5] Unlike flippers in the presale market, who can be clearly identified as buyers who transfer contracts before project completion, flippers in the resale market are defined by their holding periods. It is possible that some flippers stay in the resale market and extend their

5.2 Policy Impact on Flipping Transactions across the Markets

5.2.1 Policy 1994

We then examine the policy impact on the share of flipping transactions in the spot residential property market at the building-month level to reveal the redistribution of flippers across the market sectors. Policy 1994 only applies to the flippers in the presale residential property market, while flippers in the spot residential property market are not restricted. We choose [-1 year, +1 year] time window to identify shorter-term effect and [-2 year, +2 year] time window to identify longer-term effect. The month when the policy came into effect (1994:06) is excluded.

We use following empirical specifications:

$$Share\ of\ flip\ number_{it} = \alpha + \beta_1 Policy_{1994} + \gamma P_t + \omega_i + \varepsilon_{it} \quad \text{---(5)}$$

$$Share\ of\ flip\ amount_{it} = \alpha + \beta_1 Policy_{1994} + \gamma P_t + \omega_i + \varepsilon_{it} \quad \text{---(6)}$$

where the dependent variables $Share\ of\ flip\ number_{it}$ and $Share\ of\ flip\ amount_{it}$ are defined as the share of flipping transaction number and transaction amount at the building-month level. The independent variable $Policy_{1994}$ is a dummy variable which equals one after enacting Policy 1994, 0 otherwise. The coefficient β_1 measures changes of share of flipping transactions in the spot residential property market at the building-month level related to Policy 1994. We control the quarterly price index in the Hong Kong housing market (P_t). ω_i represents the district fixed effects. ε_{it} denotes the error term. Standard errors are clustered at the district level.

The share of flipping transactions in the spot residential property market increased after Policy 1994, as shown in Panel A of Table 3. On average, after Policy 1994, the share of flipping transaction number in the spot residential property market at the building-month level increased by 3.94 percentage points and 7.68 percentage points more than before the policy using [-1 year, +1 year] and

holding periods beyond the 2-year lock-in periods of the SSD. In other words, the policy effect in reducing the flipping transactions under the current specification might be overestimated. Using identification of existing flippers who have previous speculated in the resale market, Agarwal et al. (2022) show that a significant proportion of existing flippers leave the resale market after the SSD, which demonstrates the impact of the SSD policy on curbing flipping transactions.

[-2 year, +2 year] time window respectively. The share of flipping transaction amount in column (3) and column (4) show similar results. These results show that the presale-specific policies have impact on increasing the share of flipper buyers in the spot residential property market. This trend could be clearly presented in Figure 1. After Policy 1994, the share of flipper buyers in the presale residential property market decreased while the share of flipper buyers in the spot residential property market increased.

[INSERT TABLE 3 ABOUT HERE]

5.2.2 Special Stamp Duty

We then examine the policy impact on the share of flipping transactions at the district-month[6] level in the retail property, industrial property and office market separately to reveal the redistribution of flippers across the market sectors. The Special Stamp Duty enacted in November 2010 only applies to the flippers in the residential property market, while flippers in the non- residential property market are not restricted. We choose [-2 year, +2 year] time window to identify longer-term effect.

We use following empirical specifications:

$$Share\ of\ flip\ number_{it} = \alpha + \beta_1 Policy_{SSD} + \gamma P_t + \omega_i + \varepsilon_{it} \quad \text{---(7)}$$

$$Share\ of\ flip\ amount_{it} = \alpha + \beta_1 Policy_{SSD} + \gamma P_t + \omega_i + \varepsilon_{it} \quad \text{---(8)}$$

where the dependent variables $Share\ of\ flip\ number_{it}$ and $Share\ of\ flip\ amount_{it}$ are defined as the share of flipping transaction number and transaction amount in the retail market, industrial property market[7] and office market separately at the district-month level. The independent variable $Policy_{SSD}$ is a dummy variable which equals one after enacting Special Stamp Duty, 0 otherwise. The

[6] Due to fewer transactions in non-residential property market, we analyze the share of flipping transactions at the district-month level. There are total 60 districts assigned by the EPRC. Details are in Appendix Table A1.

[7] For industrial property transactions, the transactions of buildings aged over fifteen years old are excluded. In April 2010, Hong Kong government announced that industrial properties aged more than fifteen years could convert into non-industrial uses without paying other land premium after the policy. It is expected that more speculators will invest in industrial properties aged more than fifteen years after that policy. Including these samples will affect the accuracy of our tests.

coefficient β_1 measures changes of share of flipping transactions in the non-residential property market at the district-month level related to Special Stamp Duty. We control the quarterly price index in the Hong Kong property market (P_t). ω_i represents the district fixed effects. ε_{it} denotes the error term. Standard errors are clustered at the district level.

The percentage of flipping transactions in the retail market, industrial property market, office market didn't increase significantly after SSD, as shown in Panel B of Table 3. These results show that the anti-speculation policies in residential property market have no significant impact on increasing the share of flipper buyers in the non-residential property market.

5.3 Policy Impact on the Existing Flippers' Cross-market Movements

In previous sections, although we have already examined these two policy shocks on reducing flipping transactions in the target market sectors and redistributing flippers across the market sectors, it is not sufficient enough to support the argument that the increased share of flippers in unrestricted market after policy shocks are caused by flippers spilling over from the policy's target market to the non-target market. In this section, we control buyers' names and investigate the post-treatment cross-market movements of existing flippers in each policy's original target market sector.

We hypothesize that existing flippers in the presale residential property market will flow into the spot residential property market after Policy 1994, for there is a substitution effect between presale residential properties and spot residential properties since prior literature said that the presale property market and spot property market have many similarities and connections (Chau, Wong and Yiu, 2003; Yiu, Hui and Wong, 2005; Wong, Yiu, Tse and Chau, 2006).

At the same time, prior literature documented that the residential properties and commercial properties have relatively low co-movement (Edelstein and Tsang, 2007; Gyourko, 2009). The investment of non-residential properties may be not common among residential flippers. We then hypothesize that existing flippers in the residential property market will not flow into the non-residential property market after SSD.

5.3.1 Policy 1994

At the individual level, we first examine the policy impact on the investment behavior of existing flippers in the presale residential property market after Policy 1994. In this analysis, investors should have flipped in the presale residential property market within two years before Policy 1994. We check if pre-flippers in the presale residential property market will continue to flip in target market sector or flow into flip in other related market sectors.

We use following empirical specifications:

$$Flip_{it} = \alpha + \beta_1 Policy_{1994} + \mu_i + \omega_i + \varepsilon_{it} \quad \text{---(9)}$$

where the dependent variables $Flip_{it}$ is a dummy variable which equals one if the transaction is of flipping transactions, 0 otherwise. The independent variable $Policy_{1994}$ is a dummy variable which equals one after enacting Policy 1994 on June 8th 1994, 0 otherwise. The coefficient β_1 measures changes of policy impact on the investment behaviors of existing flippers in the presale residential property market. Results include district and buyers' names fixed effects. μ_i is the buyers' names[8] fixed effect. ω_i represents the district fixed effects. ε_{it} denotes the error term. Standard errors are clustered at the district and buyers' names level.

The result shows that existing flippers in the presale residential property market are less likely to speculate in the presale residential property market after Policy 1994 and more likely to speculate in the spot residential property market after Policy 1994, as shown in Panel A of Table 4. To be more specific, flippers in the presale residential property market are 59.50 percentage points less likely to speculate in the presale residential property market after Policy 1994 with buyers' names fixed effect, while flippers in the presale residential property market are 11.92 percentage points more likely to speculate in the spot residential property market after Policy 1994. The logit models in Column (4) to Column (6) show similar results.

These results confirm that, in general, anti-speculation policies are effective to discourage flippers

[8] There might be measurement error in our samples, for two buyers might have the same name.

to speculate in target market sector. Flipper spillover effect exists after curbing speculations in the presale residential property market. After curbing speculations in the presale residential property market, flippers in the presale residential property market are likely to flow into the spot residential property market.

5.3.2 Special Stamp Duty

We then examine the policy impact on the investment behavior of existing flippers in the entire residential property market after SSD. Under the same logic, investors should have flipped in the residential property market within two years before SSD. We check if pre-flippers in the residential property market will continue to flip in target market sector or flow into flip in non-residential property markets.

We use following empirical specifications:

$$Flip_{it} = \alpha + \beta_1 Policy_{SSD} + \mu_i + \omega_i + \varepsilon_{it} \quad \text{---(10)}$$

where the dependent variables $Flip_{it}$ is a dummy variable which equals one if the transaction is of flipping transactions, 0 otherwise. The independent variable $Policy_{ssd}$ is a dummy variable which equals one after enacting Special Stamp Duty on November 20th 2010, 0 otherwise. The coefficient β_1 measures changes of policy impact on the investment behaviors of existing flippers in the entire residential property market. Results include district and buyers' names fixed effects. μ_i is the buyers' names fixed effect. ω_i represents the district fixed effects. ε_{it} denotes the error term. Standard errors are clustered at the district and buyers' names level.

The result shows that existing flippers in the residential property market are less likely to speculate in the residential property market after SSD. On average, flippers in the residential property market are 58.25 percentage points less likely to speculate in the residential property market after SSD with buyers' names fixed effect. In addition to that, the result shows that there is no significant flipper spillover effect after SSD. With buyers' names fixed effect, the coefficients of $Policy_{SSD}$ are not significant, as shown in Column (3), (4) and (5) in Panel B of Table 4. These results show that after

curbing speculations in the entire residential property market, there is no significant flipper spillover into the non-residential property market.

[INSERT TABLE 4 ABOUT HERE]

6. Impact of Cross-market Flipping Spillovers on Price Volatility

After showing flippers flowing into the spot residential property market after Policy 1994, we further explore the changes of price volatility in the spot residential property market to investigate the role of flippers in the real estate market. The spot residential property market is not directly restricted by Policy 1994 and changes in the spot residential property market during that time window are mainly due to the increased share of flipper buyers in the spot residential property market. We choose [-1 year, +1 year] time window to identify shorter-term effect and [-2 year, +2 year] time window to identify longer-term effect. We use the following empirical specification:

$$Price\ Volatility_{it} = \alpha + \beta_1 Policy_{1994} + \beta_2 Log(transaction\ number)_{it} + \gamma_1 P_t + \gamma_2 M_t + \varphi_t + \omega_i + \varepsilon_{it} \quad \text{---(11)}$$

Following Fu, Qian and Yeung (2016), we use the difference between the highest and lowest log transaction price (after adjusting to a hedonic model) at the building-month level to measure price volatility. The control variables in a hedonic model include Hong Kong property price index, salable floor area, floor level, building age. We require the transaction number at the building-month level to be at least two. The price volatility is winsorized at the 1% level. The independent variable $Policy_{1994}$ is a dummy variable which equals one after enacting Policy 1994; 0 otherwise. $Log(transaction\ number)_{it}$ is equal to the transaction number at the building-month level. The coefficient β_1 measures changes of price volatility in the spot residential property market at the building-month level related to the policy interventions. β_2 measures the effect associated with the transaction number at the building-month level before the policy change. We control the quarterly price index in the Hong Kong housing market (P_t). We also control the monthly Hong Kong consumer price index and quarterly Hong Kong gross domestic product (M_t). Results include year-quarter and district fixed effects. φ_t is the year-quarter fixed effect and ω_i represents the district fixed effects. ε_{it}

denotes the error term. Standard errors are clustered at the year-quarter and district level.

The results show that price volatility in the spot residential property market decreased after Policy 1994, as shown in Table 5. On average, the price volatility in the spot residential property market at the building-month level decreased by 2.30 and 1.56 percentage points more than before Policy 1994 using [-1 year, +1 year] and [-2 year, +2 year] time window respectively. The difference is statistically significant at the 1% level. The results with year-quarter fixed effect in column (3) and column (4) show similar results. These results show that given flippers flowing into the spot residential property market after Policy 1994, it stabilizes the housing price and decreases price volatility.

[INSERT TABLE 5 ABOUT HERE]

7. Robustness Tests

In addition to examine the policy impact on the share of flipping transactions in sub-markets, we also examine the policy impact on the absolute value of transaction number or transaction amount of flippers and non-flippers separately to support our argument robustly. We first examine the policy impact on reducing flipping transactions in target market using the absolute value of flipping transactions in Appendix Table A3, the results confirm that anti-speculation policies are effective to curb speculations in target markets. To be more specific, on average, after Policy 1994, the transaction number for flipper buyers in the presale residential property market at the building-month level fell by 29.79 percentage points more than that for non-flippers in the presale residential property market using [-2 year, +2 year] time window. On average, after enacting SSD, the transaction number for flipper buyers in the entire residential property market at the building-month level fell by 30.55 percentage points more than that for non-flippers in the entire residential property market using [-2 year, +2 year] time window.

The flipper spillover effect is robust when using absolute value of flipping transactions, as shown in Appendix Table A4. On average, after Policy 1994, the transaction number for flippers in the spot residential property market at the building-month level increased by 10.55 percentage points more than that for non-flippers in the spot residential property market using [-2 year, +2 year] time window,

which suggests that the flipper spillover effect exists when curbing speculations in the presale residential property market. After SSD, the changes of absolute value of flipping transactions in non-residential property market is insignificant, which supports our argument that after curbing speculations in the entire residential property market, there is no significant flipper spillover into the non-residential property market.

In order to address the potential issue of a seasonality effect, we also conduct a series of placebo tests before and after June 1993 (i.e., precisely one year before Policy 1994 was enacted) and November 2010 (i.e., precisely one year before Special Stamp Duty was enacted), with the results reported in the Internet Appendix Table IA 5, 6 and 7. We only use [-1 year, +1 year] time window, for [-2 year, +2 year] time window will overlap the time period after the actual policy effect date. To be more specific, there is no evidence demonstrating that the share of flipping transactions in target market decreased after the placebo effect date of the anti-speculation policies, as shown in Appendix Table A5. Second, there is no evidence suggesting that the flipper spillover effect exists after the placebo effect date of the anti-speculation polices, as shown in Appendix Table A6. Third, the change of price volatility after placebo effect date of Policy 1994 in spot residential property market is not significant, as shown in Appendix Table A7.

In addition, in order to demonstrate that flippers will firstly flow into the spot residential property market after Policy 1994, we further examine the policy impact on the share of flipping transactions in the non-residential property market after Policy 1994. As shown in Internet Appendix Table IA 8, we do not observe flipper spillover to the non-residential property market after Policy 1994.

8. Conclusion

Using the comprehensive records of property transactions from 1991 to 2020 and two quasi-natural experiments in the Hong Kong real estate market, we examine the externality of anti-speculation policies and investigate the role of flippers in the real estate market.

First, we examine the impacts of these two policy shocks on the share of flipping transactions in the target market sectors. We find that, after the implementation the presale-specific anti-speculation policies in 1994, the share of flipping transaction number in the presale residential property market at the building-month level is 1.51 percentage points less than before the policy. After the anti-speculation policies extend to the entire residential property market in 2010, the share of flipping transaction number in the entire residential property market at the building-month level is 14.86 percentage points less than before the policy. These results show that anti-speculation policies are effective to curb speculations in the target market sectors.

Second, we examine the policy impact on redistributing flippers across the market sectors. We find that, after Policy 1994, the share of flipping transaction number in the spot residential property market at the building-month level increased by 7.68 percentage points more than before the policy. This result demonstrates the impacts of presale-specific anti-speculation policies on redistributing flippers across the presale residential property market and the spot residential property market. Under the same logic, we examine the impacts of residential-specific policies on redistributing flippers across the residential property market and the non-residential property market. We find that the share of flipping transactions in the non-residential property market didn't change significantly after SSD.

Third, at the individual level, we investigate the post-treatment cross-market movements of existing flippers in each policy's original target market sector. We find that, after Policy 1994, existing flippers in the presale residential property market are 11.92 percentage points more likely to speculate in the spot residential property market. These results confirm that flipper spillover effect exists after curbing speculations in the presale residential property market. We couldn't see the significant flipper spillover effect continues when the scope of anti-speculation policies expands to the entire residential property market after SSD.

Last, after showing flippers flowing into the spot residential property market after Policy 1994, we explore the changes of price volatility in the spot residential property market to investigate the role of flippers in the real estate market. We conclude that price volatility of the spot residential property market decreased after Policy 1994. On average, the price volatility of spot flats at the building-month

level fell by 1.56 percentage points after Policy 1994. This result confirms the market stabilizing role of flipper buyers in the real estate market.

The contributions of our study are twofold. First, this study examines the externality of government policies in the real estate market and concludes the cross-market flipper spillover exists. It is important to consider the cross-market flipper spillover when regulating speculations in the real estate market. Second, prior literature presents mixed evidence on the role of flippers in the real estate market. This study clearly tests the market stabilizing role of flippers through a well-designed framework. In addition to that, we have to emphasize that anti-speculation policies have good impact on public welfare, even though we mentioned that flippers have the market stabilizing role.

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Figure 1: Percentage of Flipping Transaction Number in the Sub-Markets

This figure presents the percentage of flipping transaction number in the sub-markets from 1992 to 2020 at year level. We define flippers buyers in the presale property market as buyers who buy the property before the completion date and resell it before project completion. We define flippers buyers in the spot property market as buyers who hold the property for less than two years.

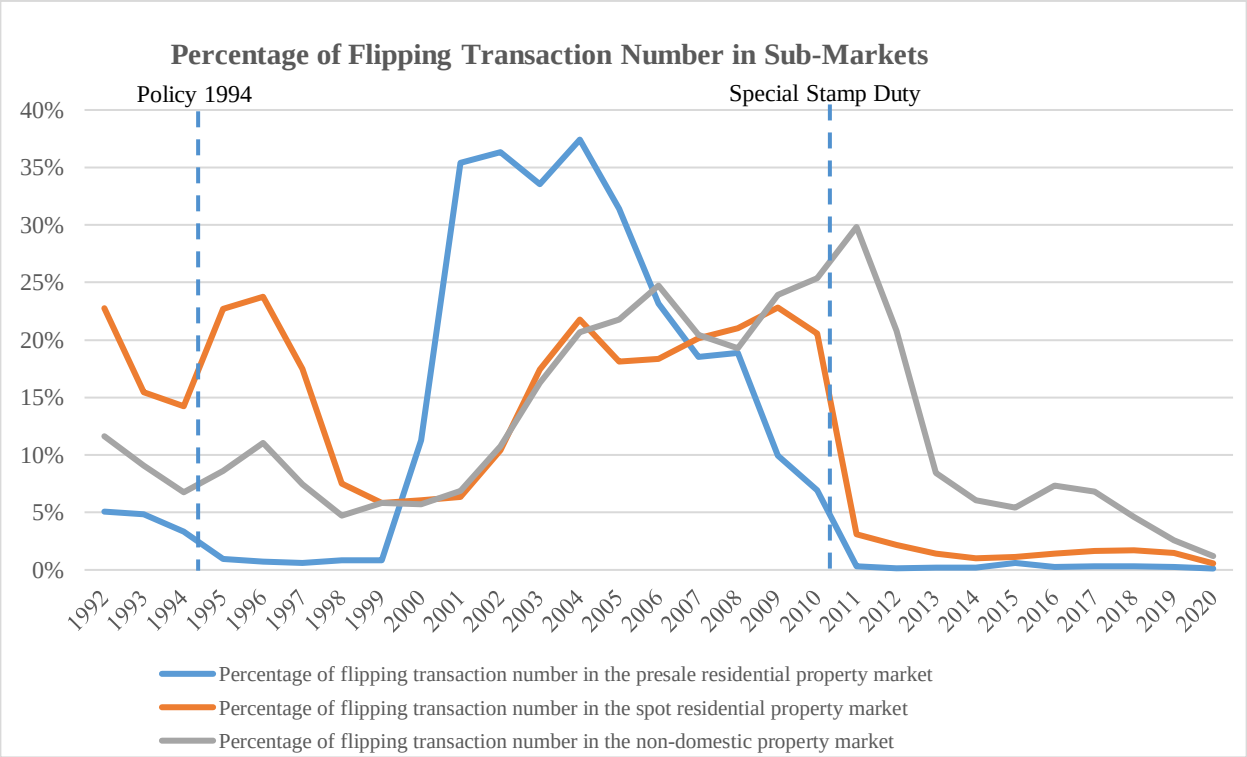

Figure 2: Details of Policy 1994 and Special Stamp Duty

The chart below summarize the details of Policy 1994 and Special Stamp Duty.

	Policy 1994	Special Stamp Duty
Purpose of the Policies	Curb speculations in the presale residential property market	Curb speculations in the entire residential property market
Implementation Date	June 8th 1994	November 20th 2010
Scope of the Policies	The presale residential property market	The entire residential property market
Measures	1) The government restricted the quota allocated to private sale from 50% to 10% of the unfinished flats. 2) The government prohibited any re-sale transactions of ASP before the Certificate of Compliance, or the consent-to-assign was provided. 3) Uncompleted flats can be sold only at most 9 months before building completions. Before enacting this policy, developers had been admitted preselling uncompleted flats up to two-year before building completions. 4) Instead of a 5% deposit, homebuyers must pay a 10% deposit for buying presale flats. If transactions are cancelled, a 5% fee will be charged.	1) All residential properties purchased from then on would be levied a special stamp duty (SSD) of 15% if property owners sold their properties within 6 months of purchase. 2) All residential properties purchased from then on would be levied a special stamp duty (SSD) of 10% if property owners sold their properties within 6 to 12 months of purchase. 3) All residential properties purchased from then on would be levied a special stamp duty (SSD) of 5% if property owners sold their properties within one to two years of purchase.

Table 1: Summary Statistics

This table provides summary statistics for key variables used in this study. *Urban_Dummy* is a dummy variable which equals one if the property is in Hong Kong Island or Kowloon and equals 0 if the property is in New Territory. *Flipper_Dummy* is a dummy variable which equals one if the owner holds the property for less than two years in the spot property market or the owner buys the property before the completion date and resell it before project completion in the presale property market; 0 otherwise. *Presale_Dummy* is a dummy variable which equals one if the transaction is a pre-sale transaction; 0 otherwise. Definitions for all variables are provided in Appendix Table A1.

Panel A: Residential Property Data

Variable	N	mean	SD	P25	P50	p75	min	max
Home Price (in millions)	1,987,493	4.738	5.715	2.089	3.350	5.488	0.001	940.397
Size (in sq. m.)	1,987,493	52.946	25.614	38.090	47.566	60.386	4.366	3,480.026
Price psm (in thousands)	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	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

Panel B: Non-residential Property Data

Variable	N	mean	SD	P25	P50	p75	min	max
Home Price (in millions)	148,307	5.173	9.279	1.379	2.581	5.199	0.007	534.911
Size (in sq. m.)	148,307	96.171	140.500	35.210	60.572	100.706	0.465	5,404.775
Price psm (in thousands)	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	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

Table 2: Policy Impact on Reducing Flipping Transactions in Target Markets

This table presents the policy impact on the share of flipping transactions in the target market sectors. *Share of flip number(amount)*, are defined as the share of flipping transaction number or amount in the target market sectors at the building-month level. In Panel A, $Policy_{1994}$, is a dummy variable which equals one after enacting the Policy 1994 and 0 otherwise. In Panel B, $Policy_{SSD}$, is a dummy variable which equals one after enacting SSD and 0 otherwise. *Property Price Index* is the quarterly property price index in the target market sectors. Results include district fixed effect. Standard errors, which are adjusted for clustering at district level, are included in parentheses, and ***, **, * indicate 1%, 5%, and 10% significance, respectively.

Panel A: Presale Anti-speculation Policy 1994

	(1)	(2)	(3)	(4)
	Presale Residential Property Market			
Dependent Variable	[-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

Panel B. Special Stamp Duty Policy 2010

	(1)	(2)	(3)	(4)
	Presale & Spot Residential Property Market			
Dependent Variable	[-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
$Policy_{SSD}$	-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

Table 3: Policy Impact on Flipping Transactions across the Markets

This table represents the policy impact on the share of flipping transactions across the markets. In Panel A, *Policy*$_{1994}$, is a dummy variable which equals one after enacting the Policy 1994 and 0 otherwise. *Share of flip number(amount),* are defined as the share of flipping transaction number or amount at the building-month level in the sub-markets. In Panel B, *Policy*$_{SSD}$, is a dummy variable which equals one after enacting SSD and 0 otherwise. *Share of flip number(amount),* are defined as the share of flipping transaction number or amount at the district-month level in the sub-markets. *Property Price Index* is the quarterly property price index in the market sectors. Results include district fixed effect. Standard errors, which are adjusted for clustering at district level, are included in parentheses, and ***, **, * indicate 1%, 5%, and 10% significance, respectively.

Panel A: Presale Anti-speculation Policy 1994

	(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

Panel B: Special Stamp Duty Policy 2010

	(1)	(2)	(3)	(4)	(5)	(6)
	Retail	Retail	Industrial	Industrial	Office	Office
	[-2,+2 years]	[-2,+2 years]	[-2,+2 years]	[-2,+2 years]	[-2,+2 years]	[-2,+2 years]
Dependent Variable	Share of flip number	Share of flip amount	Share of flip number	Share of flip amount	Share of flip number	Share of flip amount
Policy$_{SSD}$	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

Table 4: Policy Impact on Cross-market Movements of Existing Flippers

This table represents the policy impact on cross-market movements of pre-flippers. In Panel A, $Policy_{1994}$, is a dummy variable which equals one after enacting the Policy 1994 and 0 otherwise. In Panel B, $Policy_{SSD}$, is a dummy variable which equals one after enacting SSD and 0 otherwise. The results are both estimated with OLS models and Probit models. Results include district and buyers' name fixed effect. Standard errors, which are adjusted for clustering at district and buyers' name level, are included in parentheses, and ***, **, * indicate 1%, 5%, and 10% significance, respectively.

Panel A. Presale Anti-speculation Policy 1994

	(1)	(2)	(3)	(4)	(5)	(6)
	Presale & Spot Residential	Presale Residential	Spot Residential	Presale & Spot Residential	Presale Residential	Spot Residential
	[-2,+2 years]	[-2,+2 years]	[-2,+2 years]	[-2,+2 years]	[-2,+2 years]	[-2,+2 years]
	OLS	OLS	OLS	Probit	Probit	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

Panel B. 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
$Policy_{SSD}$	-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

Table 5: Impact of Cross-market Flipping Spillovers on Price Volatility

This table presents the result of the policy impact on the price volatility of the spot residential property market after Policy 1994. *Price volatility* is defined as the difference between the highest and lowest log transaction price (after adjusting for the hedonic model) at the building-month level. We require transaction number to be at least two at the building-month level. *Log(total transaction number)* is equal to the transaction number at the building-month level. *Property Price Index* is the quarterly Hong Kong property price index in the market sectors. *Macroeconomic Controls* include the monthly Hong Kong consumer price index (CPI) and quarterly Hong Kong gross domestic product (GDP). Results include year-quarter and district fixed effect. Standard errors, which are adjusted for clustering at the year-quarter and district level, are included in parentheses, and ***, **, * indicate 1%, 5%, and 10% significance, respectively.

	(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

Appendix Table A1: Variable Definitions

Variable Name	Definition
After Placebo Effect	A dummy which equals one after the placebo effect date; 0 otherwise.
CPI	The monthly Hong Kong consumer price index.
Building Age	Building age in years
District	District codes assigned by the EPRC: 1 = Aberdeen/Ap Lei Chau; 2 = Causeway Bay; 3 = Central; 4 = Chai Wan; 5 = Happy Valley; 6 = Kennedy Town; 7 = Mid-Level West; 8 = Mid-Level Central; 9 = Mid-Level East; 10 = North Point; 11 = North Point Hill; 12 = Peak; 13 = Pokfulam; 14 = Quarry Bay; 15 = Repulse Bay; 16 = Sai Ying Pun; 17 = Shau Kei Wan; 18 = Sheung Wan; 19 = Siu Sai Wan; 20 = Stanley; 21 = Tai Tam; 22 = Wan Chai; 23 = Wong Chuk Hang; 24 = Cheung Sha Wan; 25= Diamond Hill; 26 = Ho Man Tin; 27 = Hung Hom; 28 = Kai Tak; 29 = Kowloon Bay; 30 = Kowloon City; 31 = Kowloon Tong; 32 = Kwun Tong; 33 = Lai Chi Kok; 34 = Lam Tin; 35 = Mong Kok; 36 = Ngau Chi Wan; 37 = Ngau Tau Kok; 38 = San Po Kong; 39 = Sham Shui Po; 40 = Shek Kip Mei; 41 = Tai Kok Tsui; 42 = Tsim Sha Tsui; 43 = Tsz Wan Shan; 44 = Wang Tau Hom; 45 = Wong Tai Sin; 46 = Yau Ma Tei; 47 = Yau Tong; 48 = Fan Ling; 49 = Islands; 50 = Kwai Chung; 51 = Ma On Shan; 52 = Sai Kung; 53 = Sha Tin; 54 = Sheung Shui; 55 = Tai Po; 56 = Tseung Kwan O; 57 = Tsing Yi; 58 = Tsuen Wan; 59 = Tuen Mun; 60 = Yuen Long.
Flipper	A dummy variable which equals one if the owner holds the property for less than two years in the spot property market or the owner buys the property before the completion date and resell it before project completion in the presale property market; 0 otherwise.
Floor	Floor in EPRC dataset.
GDP	The quarterly Hong Kong gross domestic product.
Home Price (in millions)	CONSIDER in EPRC dataset. Property transaction price in millions. The home price is adjusted using monthly CPI (the base is October 2014).

Log(total transaction number)	The transaction number at the building-month level
Log(transaction number)	The transaction number of flipper buyers and non-flippers separately at the aggregated level.
Log(transaction amount)	The transaction amount of flipper buyers and non-flippers separately at the aggregated level.
Policy	A dummy variable which equals one after enacting the specified policy and 0 otherwise.
Presale	A dummy variable which equals one if the transaction is a pre-sale transaction; 0 otherwise.
Price psm	Property average transaction price per square meter in thousands. Property transaction price divided by property floor area.
Price Volatility	The difference between the highest and lowest log transaction price (after adjusting for a hedonic model) at the building-month level.
Property Price Index	The quarterly property price index in the market sectors.
Share of flip number	The share of flipping transaction number in sub-markets at the aggregated level.
Share of flip amount	The share of flipping transaction amount in sub-markets at the aggregated level.
Size	USIZES in EPRC dataset. Property saleable area in squared meters.
Urban	A dummy variable which equals one if the property is in Hong Kong Island or Kowloon and equals 0 if the property is in New Territory.

Appendix Table A2: Univariate Test for Property Features across Market Sectors

Panel A presents the univariate test for transactions in the presale residential property market and the spot residential property market. Panel B presents the univariate test for transactions in the residential property market and the non-residential property market. The number of observations, sample mean, difference in mean, and t-test significance are presented. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Presale Residential Property and Spot Residential Property Data

	Presale Flats		Spot Flats		Diff in Mean
Variable	N	Mean	N	Mean	t-stat
Home Price (in millions)	425,562	5.502	1,561,931	4.530	0.972***
Size (in sq. m.)	425,562	55.155	1,561,931	52.344	2.811***
Price psm (in thousands)	425,562	97.322	1,561,931	79.501	17.821***
Floor	425,562	20.786	1,561,931	15.689	5.097***
Building Age	425,562	0	1,561,931	15.142	-15.142***
Urban	425,562	0.388	1,561,931	0.497	-0.109***
Flipper	425,562	0.114	1,561,931	0.133	-0.019***

Panel B: Residential Property and Non-residential Property Data

	Residential Properties		Non-residential Properties		Diff in Mean
Variable	N	Mean	N	Mean	t-stat
Home Price (in millions)	1,987,493	4.738	148,307	5.173	-0.435***
Size (in sq. m.)	1,987,493	52.946	148,307	96.171	-43.225***
Price psm (in thousands)	1,987,493	83.317	148,307	89.665	-6.348***
Floor	1,987,493	16.780	148,307	9.112	7.668***
Building Age	1,987,493	11.899	148,307	15.994	-4.095***
Urban	1,987,493	0.474	148,307	0.608	-0.134***
Flipper	1,987,493	0.129	148,307	0.145	-0.016***
Presale	1,987,493	0.214	148,307	0.101	0.113***

Appendix Table A3: Policy Impact on Reducing Flipping Transactions in Target Markets: Robustness Check with Absolute Transaction Number and Amount

This table presents the policy impact on flipping transactions in the target market sectors at the building-month level. *Log (transaction number)* and *Log(transaction amount)* are defined as the transaction number or amount of flipper buyers and non-flippers separately at the building-month level. In Panel A, the independent variable, $Policy_{1994}$, is a dummy variable which equals one after enacting the Policy 1994, 0 otherwise. In Panel B, the independent variable, $Policy_{SSD}$, is a dummy variable which equals one after enacting Special Stamp Duty, 0 otherwise. *Flipper* is a dummy variable which equals one if the aggregated transaction number or amount is of flipper buyers; 0 otherwise. Results include year-month and district fixed effect. Standard errors, which are adjusted for clustering at the year-month and district level, are included in parentheses, and ***, **, * indicate 1%, 5%, and 10% significance, respectively.

Panel A: Presale Anti-speculation Policy 1994

	(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

Panel B: Special Stamp Duty Policy 2010

	(1)	(2)	(3)	(4)
	Entire (Presale & Spot) 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$_{SSD}$	-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

Appendix Table A4: Policy Impact on Flipping Transactions across the Markets: Robustness Check with Absolute Transaction Number and Amount

This table presents the policy impact on flipping transaction across the markets. In Panel A, the independent variable, $Policy_{1994}$, is a dummy variable which equals one after enacting the Policy 1994, 0 otherwise. *Log (flipping transaction number)* and *Log (flipping transaction amount)* are defined as the transaction number or amount of flippers in the spot residential property market at the building-month level. In Panel B, the dependent variable, $Policy_{SSD}$, is a dummy variable which equals one after enacting SSD and 0 otherwise. *Log (flipping transaction number)* and *Log (flipping transaction amount)* are defined as the transaction number or amount of flippers in the retail property, industrial property and office market separately at the district-month level. Results include year-month and district fixed effect. Standard errors, which are adjusted for clustering at the year-month and district level, are included in parentheses, and ***, **, * indicate 1%, 5%, and 10% significance, respectively.

Panel A: Presale Anti-speculation Policy 1994

	(1)	(2)	(3)	(4)
	Spot 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*Policy1994	0.1026***	0.1055***	0.1767***	0.2233***
	(0.0104)	(0.0075)	(0.0209)	(0.0146)
Flipper	-0.6944***	-0.6541***	-1.2637***	-1.1898***
	(0.0076)	(0.0057)	(0.0138)	(0.0104)
Year-month FE	YES	YES	YES	YES
District FE	YES	YES	YES	YES
Observations	130,646	263,478	130,646	263,478
R-squared	0.4213	0.3719	0.4230	0.3775

Panel B: Special Stamp Duty Policy 2010

	(1)	(2)	(3)	(4)	(5)	(6)
	Retail	Retail	Industrial	Industrial	Office	Office
	[-2,+2 years]	[-2,+2 years]	[-2,+2 years]	[-2,+2 years]	[-2,+2 years]	[-2,+2 years]
Dependent Variable	log(transaction number)	log(transaction amount)	log(transaction number)	log(transaction amount)	log(transaction number)	log(transaction amount)
Flipper*Policy$_{SSD}$	0.0235	-0.0779	0.0682	0.0289	-0.0031	-0.1693*
	(0.0342)	(0.0769)	(0.1118)	(0.2027)	(0.0481)	(0.0976)
Flipper	-0.8243***	-1.6260***	-0.8349***	-1.5732***	-0.8871***	-1.6299***
	(0.0228)	(0.0512)	(0.0690)	(0.1270)	(0.0321)	(0.0638)
Year-month FE	YES	YES	YES	YES	YES	YES
District FE	YES	YES	YES	YES	YES	YES
Observations	3,272	3,272	530	530	1,976	1,976
R-squared	0.7121	0.6356	0.4172	0.4872	0.7037	0.6582

Appendix Table A5: Policy Impact on Reducing Flipping Transactions in Target Markets: Placebo Test

This table presents the policy impact on the share of flipping transactions in the target market sectors. *Share of flip number(amount)*, are defined as the share of flipping transaction number or amount in the target market sectors at the building-month level. In Panel A, *After Placebo Effect*$_{1994}$, is a dummy which equals one after the placebo effect date, 0 otherwise. The placebo effect date for Policy 1994 is June 1993. In Panel B, *After Placebo Effect*$_{SSD}$, is a dummy which equals one after the placebo effect date, 0 otherwise. The placebo effect date for SSD is November 2009. *Property Price Index* is the quarterly property price index in the target market sectors. Results include district fixed effect. Standard errors, which are adjusted for clustering at district level, are included in parentheses, and ***, **, * indicate 1%, 5%, and 10% significance, respectively.

Panel A. Presale Anti-speculation Policy 1994

	(1)	(2)
	Presale Residential Property Market	
	[-1,+1 year]	[-1,+1 year]
Dependent Variable	Share of flip number	Share of flip amount
After Placebo Effect$_{1994}$	0.0036	0.0035
	(0.0104)	(0.0103)
Property Price Index	YES	YES
District FE	YES	YES
Observations	1,739	1,739
R-squared	0.0346	0.0348

Panel B. Special Stamp Duty Policy 2010

	(1)	(2)
	Entire (Presale & Spot) Residential Property Market	
	[-1,+1 year]	[-1,+1 year]
Dependent Variable	Share of flip number	Share of flip amount
After Placebo Effect$_{SSD}$	-0.0047	-0.0044
	(0.0054)	(0.0054)
Property Price Index	YES	YES
District FE	YES	YES
Observations	109,808	109,808
R-squared	0.0268	0.0267

Appendix Table A6: Policy Impact on Flipping Transactions across the Markets: Placebo Test

This table represents the policy impact on the share of flipping transactions across the markets. In Panel A, *After Placebo Effect*$_{1994}$, is a dummy which equals one after the placebo effect date, 0 otherwise. The placebo effect date for Policy 1994 is June 1993. *Share of flip number(amount),* are defined as the share of flipping transaction number or amount at the building-month level in the sub-markets. In Panel B, *After Placebo Effect*$_{SSD}$, is a dummy which equals one after the placebo effect date, 0 otherwise. The placebo effect date for SSD is November 2009. *Share of flip number(amount),* are defined as the share of flipping transaction number or amount at the district-month level in the sub-markets. *Property Price Index* is the quarterly property price index in the market sectors. Results include district fixed effect. Standard errors, which are adjusted for clustering at district level, are included in parentheses, and ***, **, * indicate 1%, 5%, and 10% significance, respectively.

Panel A: Presale Anti-speculation Policy 1994

	(1)	(2)
	Spot Residential Property Market	
	[-1,+1 year]	[-1,+1 year]
Dependent Variable	Share of flip number	Share of flip amount
After Placebo Effect$_{1994}$	-0.0242***	-0.0238***
	(0.0057)	(0.0057)
Property Price Index	YES	YES
District FE	YES	YES
Observations	61,983	61,983
R-squared	0.0082	0.0082

Panel B: Special Stamp Duty Policy 2010

	(1)	(2)	(3)	(4)	(5)	(6)
	Retail	Retail	Industrial	Industrial	Office	Office
	[-1,+1 years]	[-1,+1 years]	[-1,+1 years]	[-1,+1 years]	[-1,+1 years]	[-1,+1 years]
Dependent Variable	Share of flip number	Share of flip amount	Share of flip number	Share of flip amount	Share of flip number	Share of flip amount
After Placebo Effect$_{SSD}$	-0.0552*	-0.0617*	-0.0591	-0.0384	-0.0294	-0.0263
	(0.0325)	(0.0346)	(0.0819)	(0.0748)	(0.0461)	(0.0458)
Property Price Index	YES	YES	YES	YES	YES	YES
District FE	YES	YES	YES	YES	YES	YES
Observations	885	885	165	165	522	522
R-squared	0.0773	0.0739	0.1027	0.0779	0.1407	0.1261

Appendix Table A7: Policy Impact on the Price Volatility of the Spot Residential Property Market: Placebo Test

This table presents the result of the policy impact on the price volatility of the spot residential property market after placebo effect date. *After Placebo Effect*$_{1994}$, is a dummy which equals one after the placebo effect date, 0 otherwise. The placebo effect date for Policy 1994 is June 1993. *Price volatility* is defined as the difference between the highest and lowest log transaction price (after adjusting for the hedonic model) at the building-month level. We require transaction number to be at least two at the building-month level. *Log(transaction number)* is equal to the transaction number at the building-month level. *Property Price Index* is the quarterly Hong Kong property price index in the market sectors. *Macroeconomic Controls* include the monthly Hong Kong consumer price index (CPI) and quarterly Hong Kong gross domestic product (GDP). Results include year-quarter and district fixed effect. Standard errors, which are adjusted for clustering at the year-quarter and district level, are included in parentheses, and ***, **, * indicate 1%, 5%, and 10% significance, respectively.

	(1)	(2)
	Spot Residential Property Market	
	[-1, +1 year]	[-1, +1 year]
Dependent Variable	Price Volatility	Price Volatility
After Placebo Effect$_{1994}$	0.0006	0.0034
	(0.0039)	(0.0038)
log(transaction number)	0.0775***	0.0778***
	(0.0037)	(0.0023)
Property Price Index	YES	YES
Macroeconomic Controls	YES	YES
District FE	YES	YES
Year-quarter FE	NO	YES
Observations	17,307	17,307
R-squared	0.1561	0.1568

Appendix Table A8: Policy Impact of Policy 1994 on Flipper Spillover to the Non-residential Property Market: Falsification Test

This table represents the policy impact on the share of flipping transactions across the markets. *Policy$_{1994}$*, is a dummy variable which equals one after enacting the Policy 1994 and 0 otherwise. *Share of flip number(amount),* are defined as the share of flipping transaction number or amount at the district-month level in the sub-markets. *Property Price Index* is the quarterly property price index in the market sectors. Results include district fixed effect. Standard errors, which are adjusted for clustering at district level, are included in parentheses, and ***, **, * indicate 1%, 5%, and 10% significance, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Retail	Retail	Industrial	Industrial	Office	Office
	[-1,+1 years]	[-2,+2 years]	[-1,+1 years]	[-2,+2 years]	[-1,+1 years]	[-2,+2 years]
	Share of flip	Share of flip	Share of flip	Share of flip	Share of flip	Share of flip
Dependent Variable	number	number	number	number	number	number
Policy1994	0.0139	0.0459***	0.0194	-0.0068	0.0007	-0.0043
	(0.0115)	(0.0091)	(0.0150)	(0.0105)	(0.0188)	(0.0159)
Property Price Index	YES	YES	YES	YES	YES	YES
District FE	YES	YES	YES	YES	YES	YES
Observations	814	1,647	548	1,084	457	926
R-squared	0.1255	0.0867	0.0854	0.0530	0.0827	0.0776