

Property Right Restriction and House Prices

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Public Housing in Singapore: Housing and Development Board (HDB)



Source: www.theonlinecitizen.com

Background of Executive Condos (ECs)

- Introduced in 1995 to address housing affordability for sandwich class
 - US\$ 300,000 of mean HDB price vs. US\$1 M of mean private condo price
- Eligibility for ECs
 - Income ceiling of US\$10,500 vs. US\$9,000 for HDB
 - Other conditions: citizenship, age, property ownership, application history, etc.
- How It Works
 - Governmental land sales
 - Lower land prices

Executive Condominiums



Source: Sol Acres EC Official Site

Property Right Restrictions for ECs

Minimum Occupation Period (MOP)	5 years from the completion before the owner can sell it in open market
Rental restrictions	Renting out the whole EC unit within the 5-year MOP is not allowed. However, renting out of bedroom(s) is permissible.
Resale Restrictions	Owners can sell their EC unit to Singaporean citizens and PRs after the 5 years of occupation. Owners can sell their unit to anyone including foreigners after 10 years of occupancy.

Research Questions

- What is the economic impact of placing temporary restrictions on the owners' rights to rent and sell his or her property?
- To what extent does temporary, complete illiquidity reduce housing prices?
- To what extent does a temporary binding constraint on foreigners' ownership reduce housing prices?
- When the restriction is removed, do housing prices converge back?

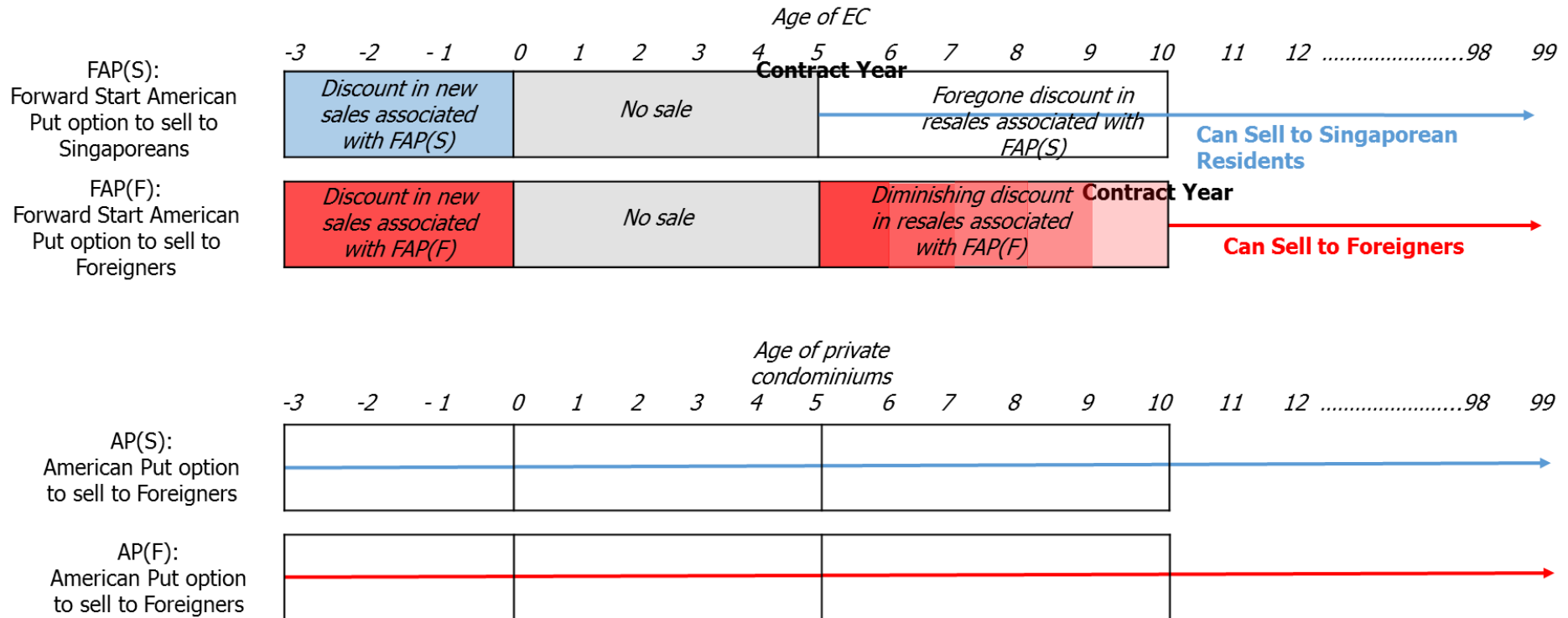
Literature Review

- Difficult to isolate the impact of one dimension of property rights
- Restriction of property rights (mostly to produce and use) and its impacts on house prices
 - Land use regulations (Quigley and Rosenthal 2005; Ihlanfeldt 2007; Munneke et al. 2013)
 - Restrictions on keeping pets (Lin et al. 2013)
 - Age of the occupants (Do and Grudnitski 1997; Carter et al. 2012; Allen 1997; Guntermann and Thomas 2004; Lin et al. 2010)
- Our research: Focus on the right to transfer and compare to other bundles of property rights

Literature Review

- Complete, temporary illiquidity on asset pricing
 - Mostly relied on the context of stock trading illiquidity (e.g. Bailey and Jagtiani, 1994)
 - Our research: calculate the discount for forward-start American put option for residential properties
- Place-based affordable housing policies
 - Indirect, non-economic outcomes or external effects (Rohe and Freeman, 2001; Cummings et al., 2002; Schwartz et al., 2006; Ellen and Horn, 2011)
 - Middle class/ownership often neglected (Linneman and Megbolugbe 1992)
 - Evaluate effectiveness of barring foreign buyers

Economic Intuitions: Forward Start American Put Option vs. American Put Option



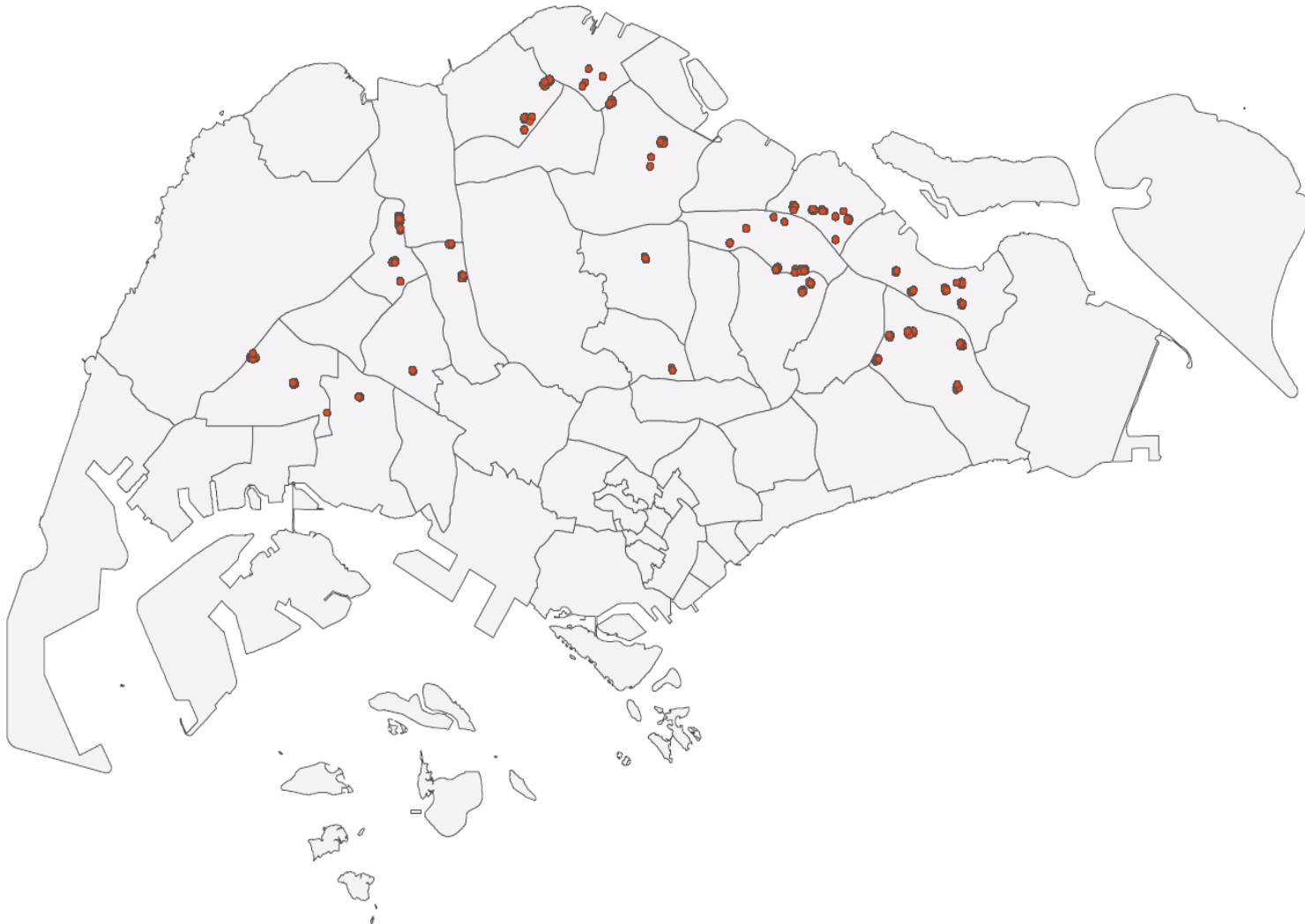
Data

- Project level information from Quarterly Property Market Information
 - Published by Urban Redevelopment Authority
 - Building approval, launch, completion dates, etc.
- Sales transaction data from Real Estate Information System (REALIS)
 - Also maintained by URA
 - Sale price, transaction date, floor area, etc.
- Project amenities and construction quality
 - Propertyguru.com.sg & BCA
 - Pool, gym, tennis court, lounge, karaoke, etc.

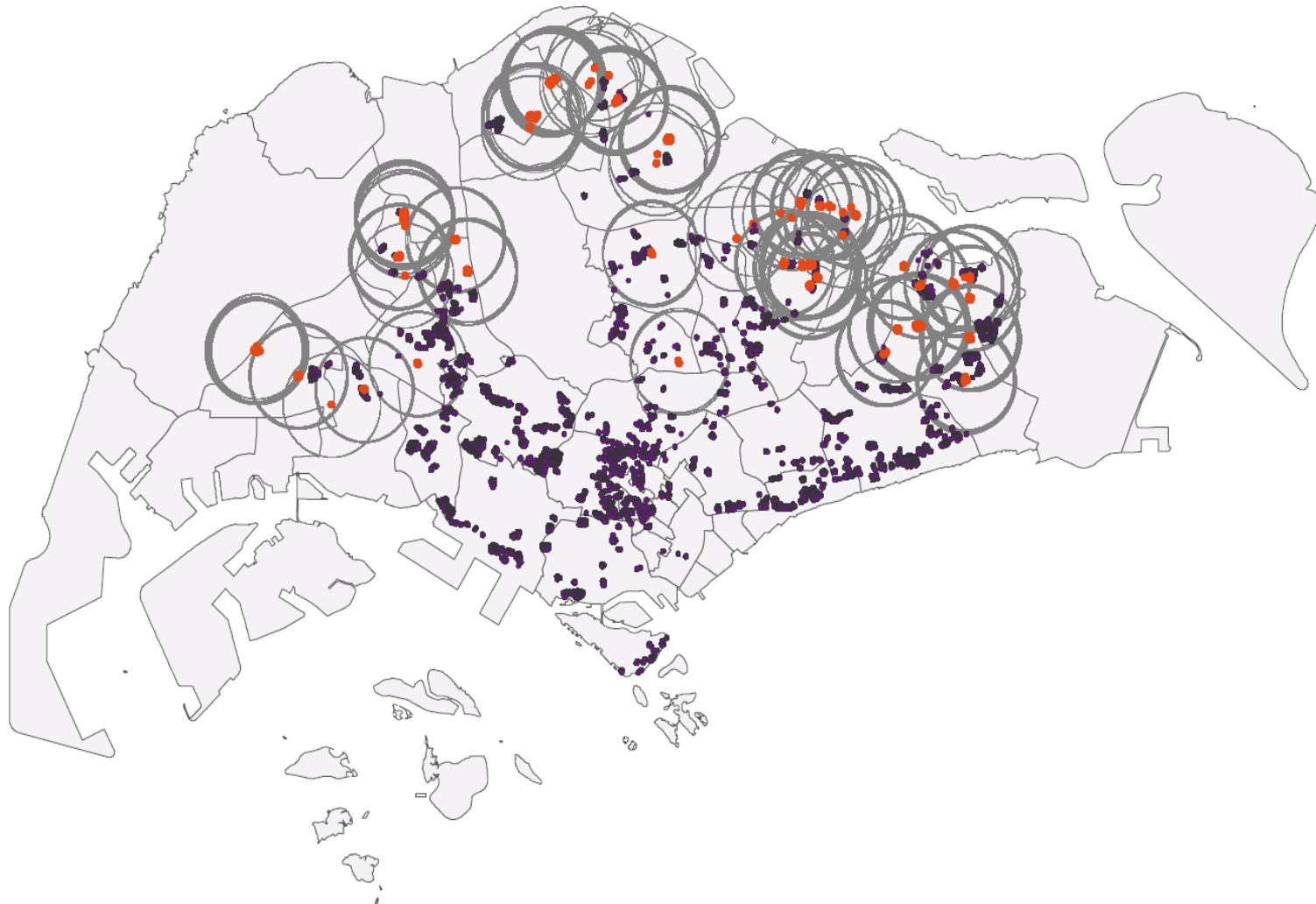
Research Design

- Quasi-experimental approach by matching ECs transacted during 1996 and 2016 (treatment) with comparable private condominiums (comparison)
- Selection criteria for the potential comparison group
 - Leasehold only
 - Within 2km distance from ECs
 - Transacted during the same period

Research Design



Research Design



Initial Sample

- 61 EC developments comprising 32,817 units transacted between 1996 and 2016 (until June)
 - New sale and resale
 - 23 EC projects with 9,986 units have crossed the tenth year milestone.
 - 2,654 units were transacted among them.
- 53,358 units in private condominiums within a 2 km distance from ECs transacted between the same period

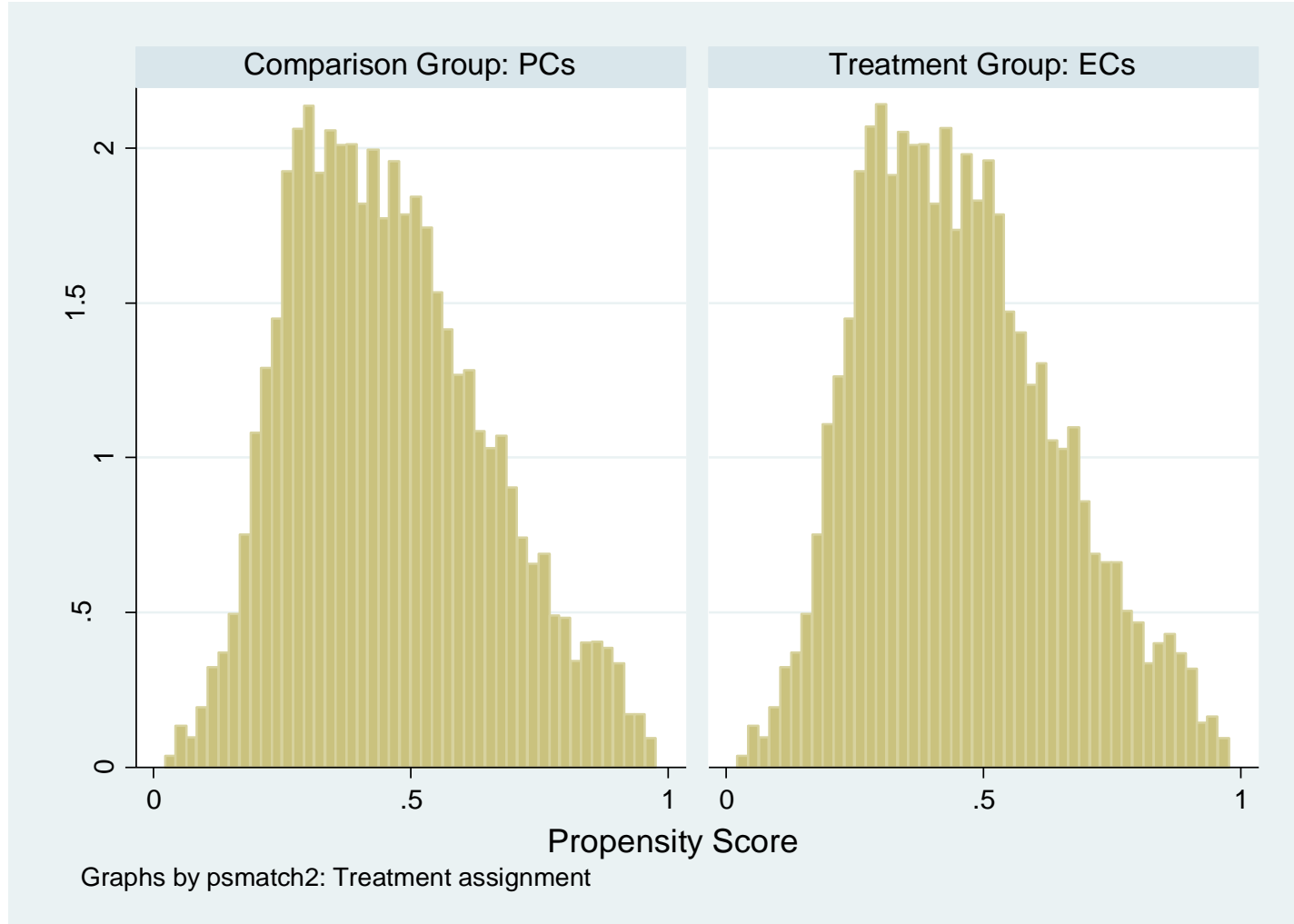
Summary Statistics of the Initial Sample

Definitions	All Units		Executive Condominiums		Private Condominiums	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Transaction price (in 2014 S\$)	803,426	1,456,145	736,019	177,775	845,323	1,845,189
Floor area of unit (m²)	110.41	320.75	115.54	23.43	107.23	407.43
Floor level of unit	8.37	5.49	8.51	4.96	8.28	5.79
Age	1.71	3.62	1.85	3.81	1.62	3.50
Distance to CBD (km)	14.12	2.61	15.02	2.47	13.56	2.53
Distance to subway (km)	0.94	0.55	1.01	0.51	0.89	0.57
# of sale transactions	86,175		32,817		53,358	

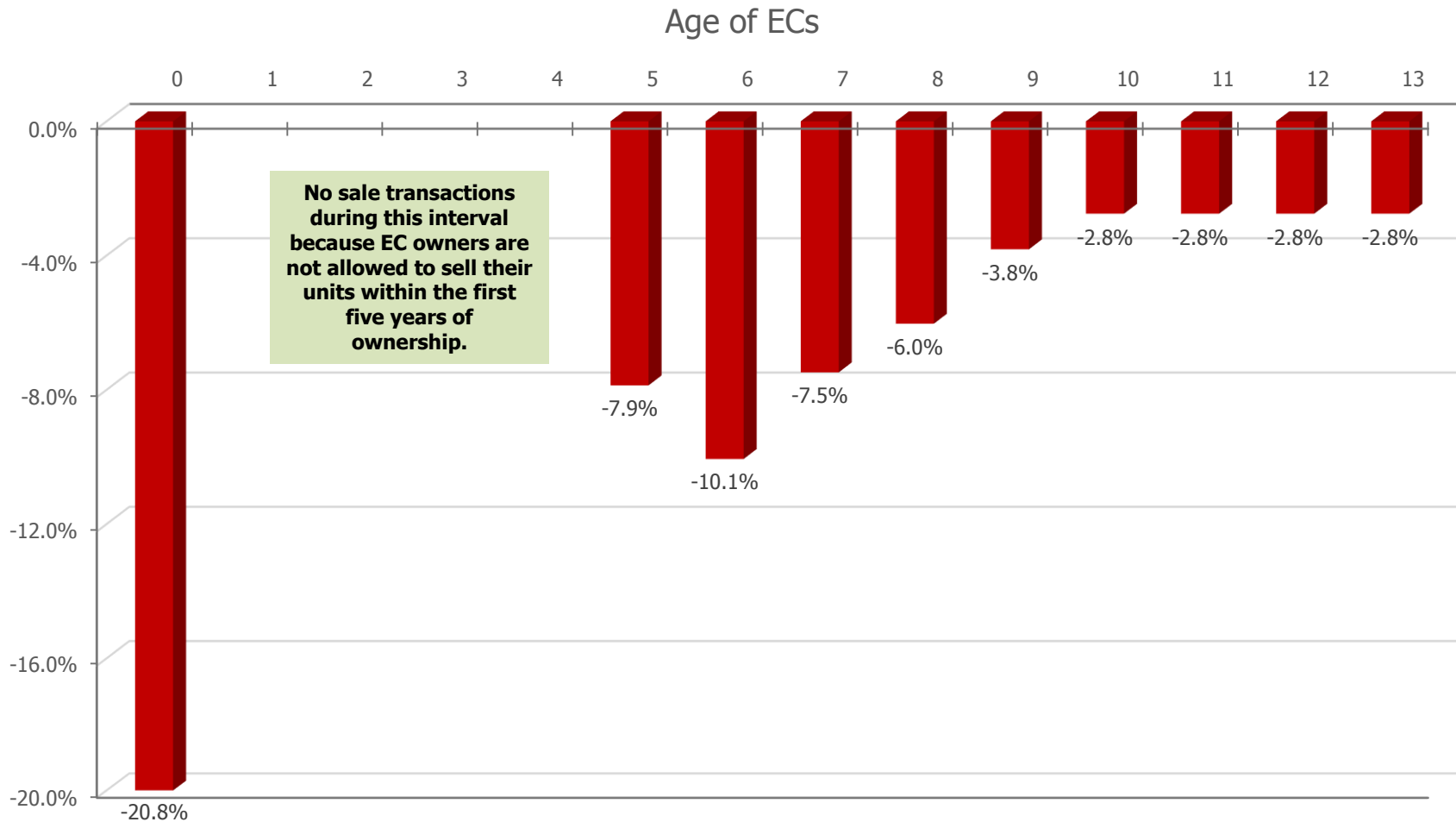
Matching Quality (caliper = 0.003)

	Mean (Treatment)	Mean (Comparison)	% Bias	P-value from 2 sample t-test	Variance Ratio	Cochran's Rule of Thumb
Transaction year	2008.4	2008.2	2.4	0.186	1.24	pass
Completion year	2008.2	2008.2	0.9	0.309	1.17	pass
Floor area of unit	114.1	112.8	4.3	0.101	0.33	pass
Floor level of unit	8.5	8.5	-0.7	0.454	0.73	pass
Complex size	1.2	1.2	2.5	0.162	1.04	pass
Distance to subway	509.5	509.6	-0.1	0.940	1.01	pass
Distance to CBD	1.0	1.0	-2.2	0.152	0.79	pass
Planning area (neighborhood)	14.5	14.5	1.1	0.221	1.05	pass
No of observations	22,912	22,912				

Matching Quality



Projected Price Gap between ECs and Matched PCs (Using Model 2)



Results on Simulated Option Price Values

Year	0	1	2	3	4	5	6	7	8	9	10
Option Price for ECs											
FAP(S)	\$223,095	\$234,248	\$238,887	\$243,618	\$248,442	\$253,361	\$253,409	\$253,452	\$253,488	\$253,518	\$253,542
FAP(F)	\$202,539	\$212,635	\$216,833	\$221,114	\$225,480	\$229,931	\$234,471	\$239,100	\$243,820	\$248,633	\$253,542
Total	\$425,634	\$446,883	\$455,720	\$464,732	\$473,922	\$483,293	\$487,880	\$492,552	\$497,308	\$502,152	\$507,083
Option Price for Private Condominiums											
AP(S)	\$252,927	\$253,118	\$253,186	\$253,249	\$253,308	\$253,361	\$253,409	\$253,452	\$253,488	\$253,518	\$253,542
AP(F)	\$252,927	\$253,118	\$253,186	\$253,249	\$253,308	\$253,361	\$253,409	\$253,452	\$253,488	\$253,518	\$253,542
Total	\$505,855	\$506,235	\$506,371	\$506,498	\$506,615	\$506,722	\$506,819	\$506,904	\$506,976	\$507,037	\$507,083
Option Price Differences											
Discount for ECs	-15.9%	-11.7%	-10.0%	-8.2%	-6.5%	-4.6%	-3.7%	-2.8%	-1.9%	-1.0%	0.0%

Robustness Checks

- Potential quality difference between ECs and private condominiums
 - Adding project amenities/construction quality scores
 - 20% initial discount and 1.5% permanent discount
- Unobserved differences and potential biases
 - Applying the bounding technique (Altonji et al. 2005; Oster 2013)
 - Bounding estimates for EC variables are much higher than the common heuristic value of 1.
- Different specification and matching methods
 - EC*YR5 & EC*YR10 only
 - Comparison group within 1 km radius

Summary of Findings

- Role of temporary restriction on transferability of property rights
 - Initially about 21% lower price (about \$111,360 per EC unit)
- Role of temporary binding constraint on foreigners' ownership (partial illiquidity)
 - Still, 8% lower price after the 5th year
- Price gap reduces to about 3% after all restrictions are removed

Discussions

- Significant, negative impact of restricting the right to transfer on property values
 - Similar to the impact of use right restrictions
- Role of partial illiquidity from temporary foreign transferability restrictions to asset pricing
 - Smaller than permanent foreign ownership restriction
- Implications for housing policy
 - EC Buyers enjoy not only living in higher quality residential units but also high price appreciation.
 - A good stepping stone for middle-income households (transitioning from HDB)