Geography and Realty Prices: Evidence from International Transaction-Level Data

Prepared for

University of Tokyo Micro Workshop

April 19, 2016

Daisuke Miyakawa (Hitotsubashi Uni.)

Chihiro Shimizu (National Uni. of Singapore)

Iichiro Uesugi (Hitotsubashi Uni.)

1. Introduction

- International money flow ⇒ Local real estate price (e.g., Sydney)
  - Asset prices in general: "Global saving glut" (Bernanke 2005)
  - Inconclusive in aggregated data
    - ◎ Aizenman & Jinjarak (2009), Justiniano et al. (2014), Jordà et al. (2014)
    - × Ferrero (2014): Weak, Favilukis et al. (2013): Other factors

- Disaggregated data accounting for international transaction?
  - Only a few…
    - Badarinza & Ramadorai (fc): Shock transmission through "proximity"

- Information asymmetry
  - Garmaise & Moskowitz (2004), Kurlat & Stroebel (2015)

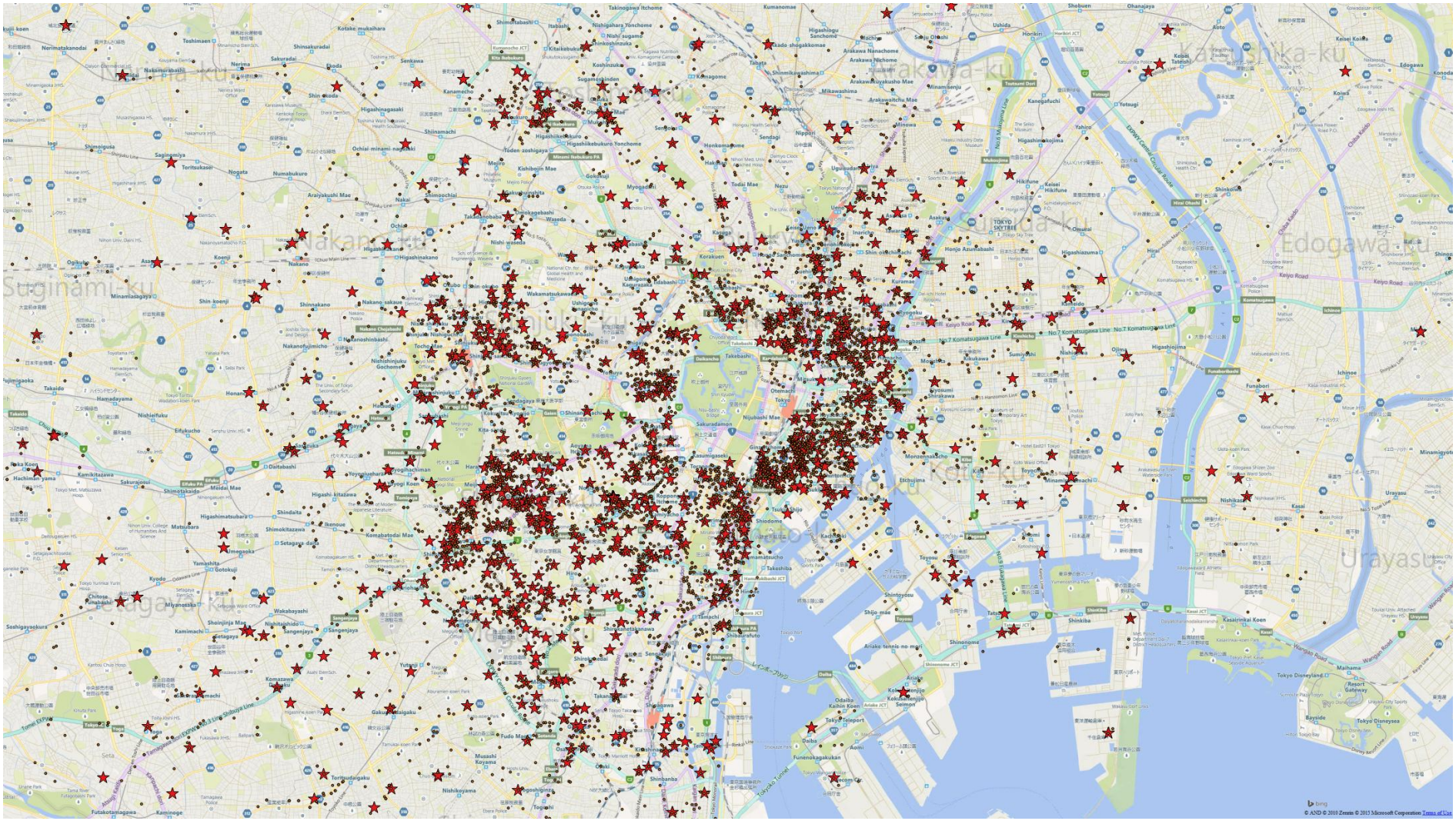
Q. Do foreign investors pay higher prices for real estate investment?

2. This paper

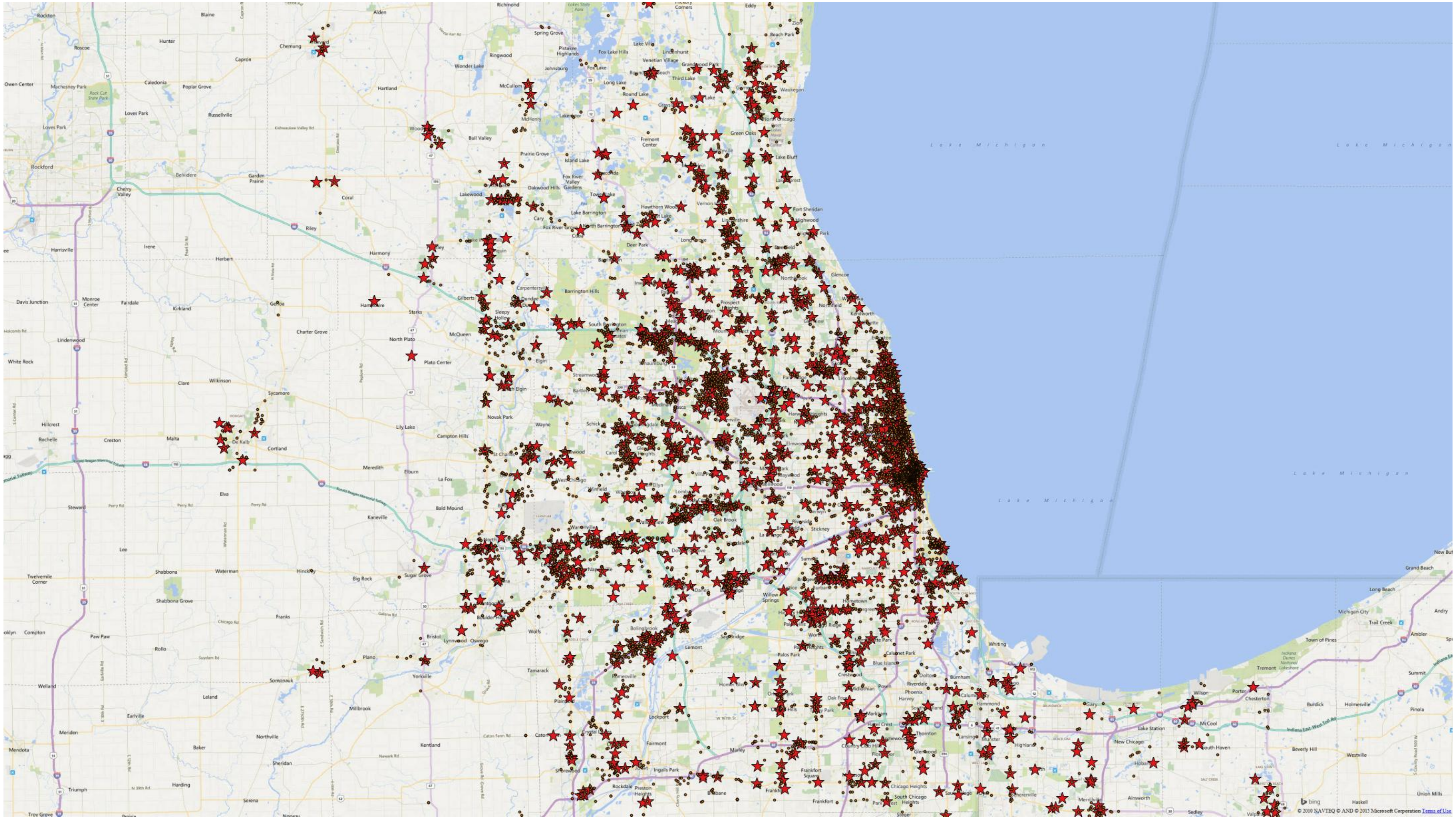
- Using…
  - Around 30,000 transaction-level data from RCA Inc.
    - Covering 8 countries (i.e., Australia, Canada, France, Hong Kong, Japan, Netherlands, UK, and US) for property location
    - Covering more than 100 countries for investors' location

- We study…
  - How investors' geographical characteristics (esp. foreign buyer or not) are related to the property prices they invest
  - How the impact (if any) is interacted w/ investment experience
  - With controlling for a comprehensive list of..
    - Property characteristics, Investors' geographical characteristics, aggregate shock, etc.

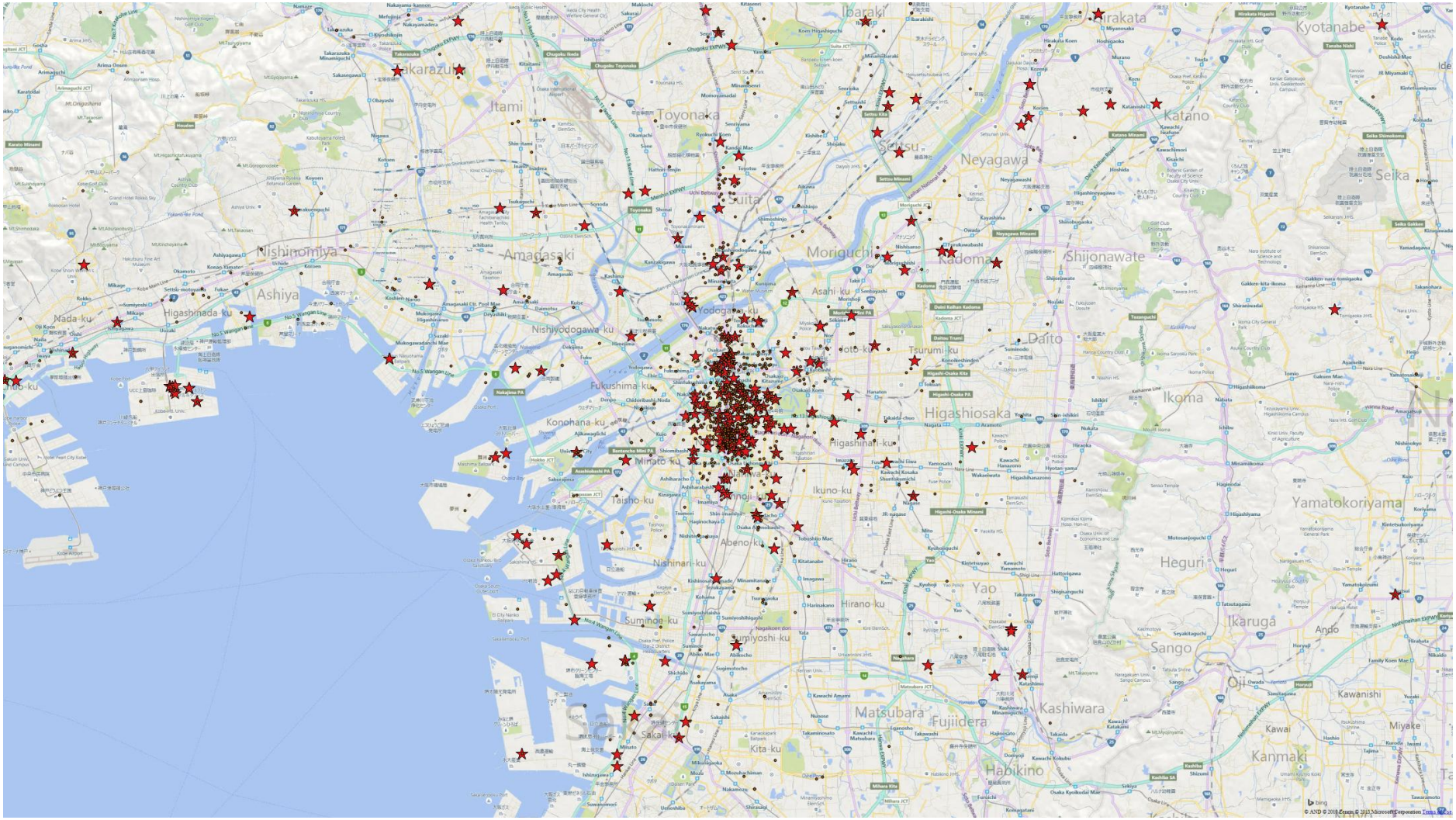
<Tokyo: ★Foreign, ●Domestic>



<Chicago>



<Osaka>


Ibaraki
Hirakata
Kyotanabe
Takarazuka
Itami
Toyonaka
Katano
Suita
Neyagawa
Seika
Nishinomiya
Amagasaki
Moriguchi
Kadoma
Shijonawate
Ashiya
Higashinada-ku
Nada-ku
Nishiyodogawa-ku
Yodogawa-ku
Asahi-ku
Daito
Tsurumi-ku
Ikoma
Fukushima-ku
Konohana-ku
Higashiosaka
Higashinari-ku
Minato-ku
Taisho-ku
Ikuno-ku
Yamatokoriyama
Abeno-ku
Nishinari-ku
Heguri
Yao
Hirano-ku
Suminoe-ku
Sumiyoshi-ku
Ikaruga
Ando
Sango
Oji
Kawanishi
Matsubara
Fujiidera
Kashiwara
Sakai-ku
Kita-ku
Kawai
Miyake
Kanmaki
Habikino

3. Key Findings

- Foreign investors pay significantly higher prices (40%+) than domestic investors
  - Such a price difference↓ as foreign investors' exposure↑

Might be too large…

- Return of foreign investors' investment is systematically lower than that of domestic investors
  - Such a return difference↓ as foreign investors' exposure↑

⇒ "Overpricing" of foreign investors is observed when investors are less informed of local property markets and resolved as investment experience↑

⇒ (Hopefully) Some implication about spillover effect

4. Literature (i): Money flow and realty prices

- Aggregated data: Yes
  - Aizenman and Jinjarak (JUE 2009)
    - Aggregate-level data accounting for 43 countries over 1978 to 2008
    - Current account deficits bring positive impacts on the realty prices
  - Justiniano et al. (JIE 2014)
    - US house prices preceding the 2008-09 financial crisis
    - Foreign capital flows account for a sizable portion of price increase
- Aggregated data: ???
  - Favilukis et al. (NBER book chapter 2013)
    - Impact associated with international money flow is limited
  - Ferrero (JMCB 2014)
    - US and in several other countries
    - Several domestic factors such as credit and preference are dominant

- **Our paper: Revisit this issue with disaggregated data**

4. Literature (ii): Micro-level determinants?

- Physical characteristics
  - So many papers in the context of hedonic pricing
  - Kurlat & Stroebel (RFS 2015)
    - Characteristics of nearby properties also matter
- Information asymmetry b/w insiders & outsiders
  - Kurlat & Stroebel (RFS 2015)
    - Realty transaction for LA county in the US
    - ↑ in price after investment is smaller when the share of informed seller is higher and/or buyer is less informed
  - Garmaise & Moskowitz (RFS 2004)
    - Realty transaction data in U.S.
    - Median distance b/w buyers & property becomes shorter as the dispersions of evaluated value and transaction prices become larger (result is less apparent for older property)

Geographical characteristics matter for stock investment
Coval & Moskowitz (JPE 2001)

Presumably, info asymmetry matters more

- **Our paper: Extend to international transaction**

4. Literature (iii): International transaction?

- Badarinza and Ramadorai (JFE forthcoming)
  - Housing transactions in the UK
  - UK Land Registry, Nationwide Building Society, and Office for National Statistics in UK (for resident information)
  - Time-series indexes of country-level economic and political risk measures from ICRG
  - Exogenous shock in home country (i.e., outside of UK) is transmitted to the realty prices in the areas where many residents from the country are living

- **Our paper: We utilize many pairs accounting for buyer countries and the counties where property locate (i.e., using larger heterogeneity to extract more detailed mechanism governing realty transaction)**

5. Data (i): Data overview

- Real Capital Analytics Inc. Data
  - One of the most influential data vendors specializing in real estate investments (headquarter is located in NY)
  - Transaction-level data for the period 2005-2015
  - Original data we obtained from RCA covers the 71,000 realty transactions in eight countries
    - Australia, Canada, France, Hong Kong, Japan, Netherlands, UK, and US
  - Data covers relatively large investment transactions
    - At least one million USD
    - Focuses on the large cities: Amsterdam, Chicago, Kyoto, LA, London, New York, Osaka, Paris, San Francisco, Sydney, Tokyo, Toronto, and Vancouver

Got BRICK (+8,300 obs) recently…

5. Data (ii-a): Variables

- Information is about the property
  - Price measured in USD: *LN_PriceUSD*
  - Property's size measure by square feet: *LN_Sqft*
  - Size of land where property locates: *LN_land_area_nb*
  - Age of each property: *Age*
  - Type of the property
    - Categorical variables accounting for apartment, development site, hotel, industrial, office, other, retail, and seniors & care
    - Eight dummy variables for these property type: *Property type*

5. Data (ii-b): Variables

- Transaction-related information
  - Countries invested property locates: *Property location country*
  - Countries buyer locates: *Buyer country*
  - Countries seller locates: *Seller country*

⇒ 8 dummy variables for *Property location country*, and at most 102 dummy variables for *Buyer country* and *Seller country*

  - We also construct dummy variables for the individual effects to each pair of the countries where invested property locates and countries where buyer locate: *Property Location-Buyer Country*

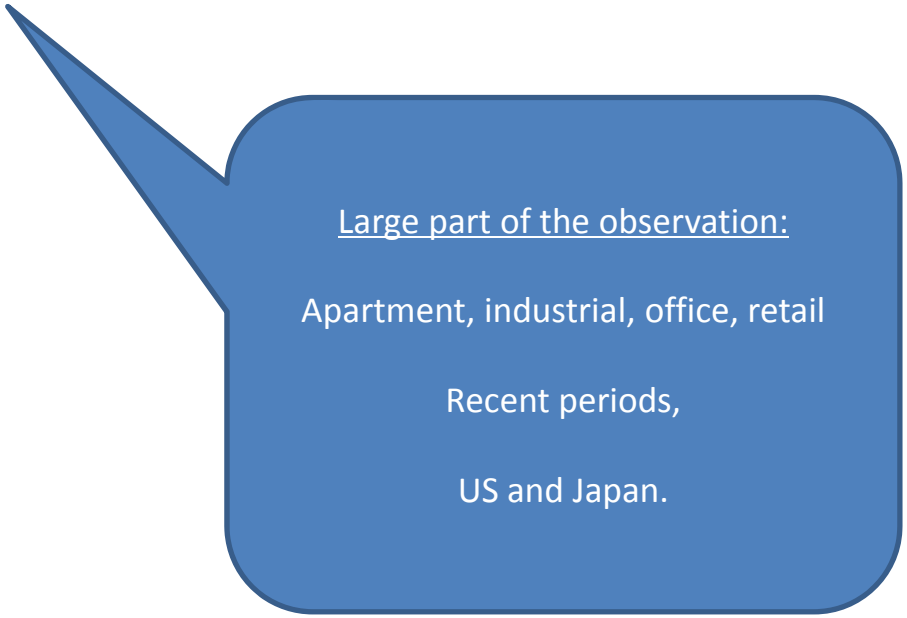
⇔ E.g., geographical distance b/w the property & buyer locations

<Table 1>

Property type	Freq.	Percent	Cum.
Apartment	10,439	35.89	35.89
Dev Site	50	0.17	36.06
Hotel	670	2.3	38.36
Industrial	5,540	19.04	57.4
Office	7,101	24.41	81.82
Other	120	0.41	82.23
Retail	4,978	17.11	99.34
Seniors Housing & Care	192	0.66	100
Total	29,090	100	

Property location country	Freq.	Percent	Cum.
Australia	579	1.99	1.99
Canada	393	1.35	3.34
France	184	0.63	3.97
Hong Kong	64	0.22	4.19
Japan	6,336	21.78	25.97
Netherlands	32	0.11	26.08
United Kingdom	274	0.94	27.03
United States	21,228	72.97	100
Total	29,090	100	

Year	Freq.	Percent	Cum.
2005	1,816	6.24	6.24
2006	2,355	8.1	14.34
2007	2,820	9.69	24.03
2008	1,868	6.42	30.45
2009	1,164	4	34.46
2010	1,833	6.3	40.76
2011	2,326	8	48.75
2012	3,285	11.29	60.04
2013	3,771	12.96	73.01
2014	4,409	15.16	88.16
2015	3,443	11.84	100
Total	29,090	100	



5. Data (ii-c): Variables

- Investor-related information
  - *Buyer/Seller capital group*:
    - What kind of investment entity the buyer and seller are
    - Equity fund, institutional, private, and public
    - Dummy variables
  - *Buyer/Seller capital type*:
    - Detailed characteristics of investment funds
    - Corporate, developer/owner/operator, investment manager, REIT, etc.

⇔ E.g., Relative bargaining power b/w buyer and seller

⇔ E.g., Difference in their funding environments

<Table 1 cont'd>

Buyer capital group	Freq.	Percent	Cum.
<unknown>	533	1.83	1.83
Equity Fund	1,612	5.54	7.37
Institutional	2,293	7.88	15.26
Private	17,787	61.14	76.4
Public	4,842	16.64	93.05
User/Other	2,023	6.95	100
Total	29,090	100	

Seller capital group	Freq.	Percent	Cum.
<unknown>	710	2.44	2.44
CMBS	1	0	2.44
Equity Fund	1,404	4.83	7.27
Institutional	3,645	12.53	19.8
Private	17,684	60.79	80.59
Public	3,208	11.03	91.62
User/Other	2,438	8.38	100
Total	29,090	100	

Large part of the observation:

Buyer & Seller: Private

<Table 1 cont'd>

Large part of the observation:

Buyer: Corporate,
Seller: Developer/Owner/Operator

Buyer capital type	Freq.	Percent	Cum.
<unknown>	533	1.83	1.83
Bank	199	0.68	2.52
CMBS	1	0	2.52
Cooperative	1,570	5.4	7.92
Corporate	16,850	57.92	65.84
Developer/Owner/Operator	112	0.39	66.23
Educational	1,612	5.54	71.77
Finance	282	0.97	72.74
Government	152	0.52	73.26
High Net Worth	548	1.88	75.14
Insurance	193	0.66	75.81
Investment Manager	1,338	4.6	80.41
Listed Funds	35	0.12	80.53
Non Traded REIT	389	1.34	81.86
Non-Profit	131	0.45	82.31
Open-Ended Fund	106	0.36	82.68
Other	23	0.08	82.76
Other/Unknown	2	0.01	82.76
Pension Fund	106	0.36	83.13
REIT	3,733	12.83	95.96
Religious	34	0.12	96.08
REOC	1,074	3.69	99.77
Sovereign Wealth Fund	67	0.23	100
Total	29,090	100	

Seller capital type	Freq.	Percent	Cum.
<unknown>	710	2.44	2.44
Bank	728	2.5	4.94
CMBS	1	0	4.95
Cooperative	2	0.01	4.95
Corporate	2,051	7.05	12
Developer/Owner/Operator	16,895	58.08	70.08
Educational	40	0.14	70.22
Endowment	3	0.01	70.23
Equity Fund	1,404	4.83	75.06
Finance	602	2.07	77.13
Government	157	0.54	77.67
High Net Worth	669	2.3	79.97
Insurance	249	0.86	80.82
Investment Manager	1,803	6.2	87.02
Listed Funds	36	0.12	87.14
Non Traded REIT	120	0.41	87.56
Non-Profit	113	0.39	87.94
Open-Ended Fund	118	0.41	88.35
Other	13	0.04	88.39
Pension Fund	120	0.41	88.81
REIT	1,730	5.95	94.75
Religious	62	0.21	94.97
REOC	1,442	4.96	99.92
Sovereign Wealth Fund	22	0.08	100
Total	29,090	100	

5. Data (ii-d): Variables

- *dum_forbuyer*:
  - Taking value of one if these two locations are different
- *INVACC*:
  - Buyer's investment experience
  - Natural logarithm of accumulated investment amount from the country each buyer locates to the country where property locates (*INVACC_unadj*).
    - In each data point (monthly)
    - We choose to construct the variable as country-level variable.
    - Information sharing in one country (Badarinza and Ramadorai 2015).
  - This variable monotonically increasing over the data periods,
    - Following the preceding study (e.g., Gompers et al. 2008)
    - Standardize this variable to construct a new variable *INVACC* by dividing it by the total sum of investment amounts from the country each buyer locates until the previous month to each data point

<Table 2>

Variable	Definition of variables	Obs	Mean	Std. Dev.	Min	Max
LN_PriceUSD	Accumulated investment amounts from buyer country to property location country until the previous month	29090	16.03	1.21	0.00	21.41
INVACC (note: see the header of the column)	Accumulated investment amounts from buyer country to property location country until the previous month (this variable is adjusted by the accumulated investamounts from buyer country until the previous month)	29090	0.78	0.18	0.00	1.00
INVACC_unadj (note: see the header of the column)	Unadjusted INVACC	29090	25.67	1.41	14.30	26.92
dum_forbuyer	Dummy varibale takling value of 1 if buyer country is different from property location country	29090	0.05	0.21	0	1
LN_Sqft	Property size measured by square feet	29090	10.54	1.19	-0.87	19.02
LN_land_area_acres_nb	Land size measured by acres	29090	-0.45	1.83	-13.09	13.76
Age	Observation year minus developped year	29090	42.58	31.84	-5	360

6. Empirical Methodology

■ Multi-level panel estimation-1

$$LN\_PriceUSD_{i,p,b,s,t} = \alpha + \beta_1 dum\_forbuyer_{p,b} + \beta_2 INVACC_{p,b,t} + \beta_3 dum\_forbuyer_{p,b} \times INVACC_{p,b,t} + \boldsymbol{X_i\gamma} + \eta_p^1 + \eta_b^2 + \eta_s^3 + \eta_t^4 + \varepsilon_t \quad (1)$$

Property characteristics

Fixed-effects
(also for investor type)

where

i: Property identification

p: Property location country (destination)

b: Buyer location country

s: Seller location country

t: Year-Month (time variable in this estimation)

6. Empirical Methodology

- Multi-level panel estimation-2

$$LN\_PriceUSD_{i,p,b,s,t} = \alpha + \beta_1 dum\_forbuyer_{p,b} + \beta_2 INVACC_{p,b,t} + \beta_3 dum\_forbuyer_{p,b} \times INVACC_{p,b,t} + \boldsymbol{X}_i\boldsymbol{\gamma} + \delta_{p,b}^1 + \eta_t^4 + \varepsilon_t \quad (2)$$

Fixed-effects

where

- i: Property identification
- p: Property location country (destination)
- b: Buyer location country
- s: Seller location country
- t: Year-Month (time variable in this estimation)

7. Empirical results (i): Baseline estimation

Dependent var = LN_PriceUSD	Baseline estimation							
	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.
<Independent Variables>								
INVACC	0.526	0.103 ***	0.241	0.141 *	0.315	0.143 **	0.602	0.127 ***
dum_forbuyer	0.685	0.094 ***	0.425	0.117 ***	0.423	0.119 ***	1.586	0.393 ***
INVACC×dum_forbuyer	-0.725	0.194 ***	-0.639	0.242 ***	-0.817	0.257 ***	-0.971	0.404 **
LN_Sqft	0.717	0.006 ***	0.732	0.007 ***	0.702	0.007 ***	0.683	0.007 ***
LN_land_area_acres_nb	-0.036	0.004 ***	-0.039	0.004 ***	-0.040	0.004 ***	-0.036	0.004 ***
Age	-0.001	0.000 ***	-0.002	0.000 ***	-0.001	0.000 ***	-0.001	0.000 ***
_cons	8.273	0.105 ***	8.392	0.154 ***	8.627	0.162 ***	8.334	0.116 ***
<Fixed-effect>								
Property type	yes		yes		yes		yes	
Year	yes		yes		yes		yes	
Property location country	yes		yes		yes			
Buyer country			yes		yes			
Seller country			yes		yes			
Buyer capital group					yes		yes	
Seller capital group					yes		yes	
Buyer capital type					yes		yes	
Seller capital type					yes		yes	
Property Location-Buyer Country							yes	
No. Obs.	35205		29100		29090		34585	
R-squared	0.68		0.69		0.70		0.70	
Root MSE	0.6660		0.6739		0.6614		0.3506	

7. Empirical results (ii): Other issues

Dependent var = LN_PriceUSD	(i) Control for relative (i.e., to world) return of housing price index associated with the country where property locates				(ii) Control for the investment amounts from other countries				(iii) Non-linearity of INVACC			
	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.
<Independent Variables>												
INVACC	0.210	0.143	0.501	0.128 ***	0.325	0.145 **	0.598	0.130 ***				
INVACC_Q2									0.134	0.017 ***	0.123	0.016 ***
INVACC_Q3									0.177	0.020 ***	0.179	0.018 ***
INVACC_Q4									0.117	0.032 ***	0.153	0.027 ***
dum_forbuyer	0.339	0.119 ***	1.370	0.402 ***	0.409	0.122 ***	1.474	0.400 ***	0.245	0.038 ***	2.620	0.163 ***
INVACC×dum_forbuyer	-0.701	0.265 ***	-0.842	0.409 **	-0.798	0.260 ***	-0.894	0.411 **				
INVACC_Q2×dum_forbuyer									-2.163	0.444 ***	-3.808	0.164 ***
INVACC_Q3×dum_forbuyer									-0.456	0.188 **	-0.877	0.253 ***
INVACC_Q4×dum_forbuyer									0.072	0.083	0.005	0.111
LN_Sqft	0.702	0.008 ***	0.683	0.007 ***	0.701	0.007 ***	0.682	0.007 ***	0.703	0.007 ***	0.684	0.007 ***
LN_land_area_acres_nb	-0.040	0.004 ***	-0.037	0.004 ***	-0.040	0.004 ***	-0.036	0.004 ***	-0.039	0.004 ***	-0.036	0.004 ***
Age	-0.001	0.000 ***	-0.001	0.000 ***	-0.001	0.000 ***	-0.001	0.000 ***	-0.001	0.000 ***	-0.001	0.000 ***
Past YoY return (t-1, ⋯, t-8)	(Suppressed)											
INV_OTHERS					0.014	0.005 ***	0.015	0.005 ***				
_cons	8.734	0.164 ***	8.362	0.117 ***	7.989	2754.232	8.058	0.149 ***	9.566	0.624 ***	8.645	0.080 ***
<Fixed-effect>												
Property type	yes		yes		yes		yes		yes		yes	
Year	yes		yes		yes		yes		yes		yes	
Property location country	yes				yes				yes			
Buyer country	yes				yes				yes			
Seller country	yes				yes				yes			
Buyer capital group	yes		yes		yes		yes		yes		yes	
Seller capital group	yes		yes		yes		yes		yes		yes	
Buyer capital type	yes		yes		yes		yes		yes		yes	
Seller capital type	yes		yes		yes		yes		yes		yes	
Property Location-Buyer Country			yes				yes		yes		yes	
Realtive past returns	yes		yes									
Investment from other countries					yes		yes					
No. Obs.	28828		34291		28893		34360		29397		34996	
R-squared	0.70		0.70		0.70		0.70		0.71		0.70	
Root MSE	0.6619		0.6508		0.6621		0.6508		0.6601		0.6490	

7. Empirical results (iii): INV variable

Dependent var = LN_PriceUSD	Using the observation such as INVACC<1				INVACC=INVACC_unadj			
	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.
<Independent Variables>								
INVACC	0.318	0.143 **	0.609	0.127 ***	0.013	0.014	0.053	0.012 ***
dum_forbuyer	0.435	0.119 ***	2.594	0.420 ***	0.241	0.462	3.962	0.468 ***
INVACC×dum_forbuyer	-1.044	0.266 ***	-1.737	0.450 ***	-0.002	0.020	-0.060	0.022 ***
LN_Sqft	0.702	0.007 ***	0.683	0.007 ***	0.702	0.007 ***	0.683	0.007 ***
LN_land_area_acres_nb	-0.040	0.004 ***	-0.036	0.004 ***	-0.040	0.004 ***	-0.036	0.004 ***
Age	-0.001	0.000 ***	-0.001	0.000 ***	-0.001	0.000 ***	-0.001	0.000 ***
_cons	9.657	0.236 ***	8.331	0.116 ***	9.128	0.312 ***	7.634	0.271 ***
<Fixed-effect>								
Property type	yes		yes		yes		yes	
Year	yes		yes		yes		yes	
Property location country	yes				yes			
Buyer country	yes				yes			
Seller country	yes				yes			
Buyer capital group	yes		yes		yes		yes	
Seller capital group	yes		yes		yes		yes	
Buyer capital type	yes		yes		yes		yes	
Seller capital type	yes		yes		yes		yes	
Property Location-Buyer Country			yes				yes	
No. Obs.	29081		34576		29090		34585	
R-squared	0.70		0.70		0.70		0.70	
Root MSE	0.6613		0.6505		0.6615		0.6506	

7. Empirical results (iv): Periods

Dependent var = LN_PriceUSD	Year<2011				Year>=2011			
	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.
<Independent Variables>								
INVACC	0.354	0.181 **	0.605	0.162 ***	1.758	0.432 ***	4.255	0.592 ***
dum_forbuyer	0.481	0.152 ***	1.232	0.254 ***	1.495	0.350 ***	4.916	0.460 ***
INVACC×dum_forbuyer	-1.248	0.359 ***	-1.467	0.678 **	-1.209	0.485 **	-4.369	0.965 ***
LN_Sqft	0.723	0.010 ***	0.694	0.009 ***	0.693	0.010 ***	0.679	0.009 ***
LN_land_area_acres_nb	-0.040	0.007 ***	-0.029	0.006 ***	-0.040	0.005 ***	-0.039	0.005 ***
Age	-0.003	0.000 ***	-0.002	0.000 ***	0.000	0.000	0.000	0.000
_cons	13.237	0.537 ***	8.114	0.139 ***	7.495	0.461 ***	5.914	0.437 ***
<Fixed-effect>								
Property type	yes		yes		yes		yes	
Year	yes		yes		yes		yes	
Property location country	yes				yes			
Buyer country	yes				yes			
Seller country	yes				yes			
Buyer capital group	yes		yes		yes		yes	
Seller capital group	yes		yes		yes		yes	
Buyer capital type	yes		yes		yes		yes	
Seller capital type	yes		yes		yes		yes	
Property Location-Buyer Country			yes				yes	
No. Obs.	11856		14639		17234		19946	
R-squared	0.74		0.73		0.70		0.69	
Root MSE	0.6244		0.6079		0.6714		0.6683	

7. Empirical results (v): Property type

Dependent var = LN_PriceUSD	Apartment		Industrial		Office		Retail	
	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.
<Independent Variables>								
INVACC	0.030	0.318	0.507	0.212 **	1.099	0.232 ***	-0.356	0.642
dum_forbuyer	0.222	0.283	0.538	0.170 ***	0.938	0.195 ***	0.001	0.506
INVACC×dum_forbuyer	-1.376	1.026	-4.120	0.737 ***	-0.985	0.305 ***	0.425	0.996
LN_Sqft	0.692	0.019 ***	0.562	0.013 ***	0.853	0.010 ***	0.585	0.015 ***
LN_land_area_acres_nb	0.018	0.008 **	-0.016	0.007 **	-0.065	0.008 ***	-0.033	0.009 ***
Age	-0.005	0.000 ***	0.003	0.000 ***	0.000	0.000	0.000	0.000
_cons	9.394	0.554 ***	12.919	0.510 ***	6.733	0.271 ***	10.021	0.683 ***
<Fixed-effect>								
Property type	yes		yes		yes		yes	
Year	yes		yes		yes		yes	
Property location country	yes		yes		yes		yes	
Buyer country	yes		yes		yes		yes	
Seller country	yes		yes		yes		yes	
Buyer capital group	yes		yes		yes		yes	
Seller capital group	yes		yes		yes		yes	
Buyer capital type	yes		yes		yes		yes	
Seller capital type	yes		yes		yes		yes	
Property Location-Buyer Country								
No. Obs.	10439		5540		7101		4978	
R-squared	0.66		0.60		0.77		0.66	
Root MSE	0.5640		0.6044		0.6542		0.6986	

7. Empirical results (vi): Country

- Each country has a different regulation for FDI to real estate
  - E.g., AUS: Foreign investors can invest only on newly built one

Dependent var = LN_PriceUSD	AUS	CAN	FRA	JPN	UK	US
	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.
<Independent Variables>						
INVACC	0.889	1.194 ***	3.863	-0.613	-0.414	0.037
dum_forbuyer	0.863 **	0.742 **	3.875	-0.314	-0.043	0.349
INVACC×dum_forbuyer	-0.191	-3.590 ***	-3.869	-3.286 ***	0.678	-0.023
LN_Sqft	0.899 ***	0.935 ***	0.945 ***	0.839 ***	0.895 ***	0.675 ***
LN_land_area_acres_nb	-0.116 ***	-0.123 **	-0.095 *	-0.036 **	-0.119 **	-0.031 ***
Age	0.002 *	0.000	0.002 **	-0.010 ***	-0.001	-0.001 ***
_cons	6.290 ***	5.706 ***	2.765	8.420 ***	7.813 ***	8.411 ***
<Fixed-effect>						
Property type	yes	yes	yes	yes	yes	yes
Year	yes	yes	yes	yes	yes	yes
No. Obs.	622	523	205	6961	290	26464
R-squared	0.74	0.81	0.71	0.64	0.74	0.60
Root MSE	0.5366	0.5151	0.7484	0.7150	0.6602	0.6375

7. Empirical results (vii): Robustness

- The results are also robust to…
  - Add BRICS data (recently obtained)
  - Control for city-level fixed-effect
  - Focus on the buyer-country & seller-country that have more than one hundred transaction in total

7. Empirical results (viii): Matched sample

- "Matched" sample based on the geographical distance b/w
  - Property invested by foreign investor ⇔ by domestic investor

Dependent var = LN_PriceUSD	CAN All sample (from previous table)		CAN distance<1km		CAN distance<500m	
	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.
<Independent Variables>						
INVACC	1.194	0.445 ***	1.189	0.445 ***	1.511	0.547 ***
dum_forbuyer	0.742	0.323 **	0.764	0.326 **	0.919	0.389 **
INVACC×dum_forbuyer	-3.590	1.234 ***	-3.996	1.250 ***	-3.605	1.417 **
LN_Sqft	0.935	0.051 ***	0.892	0.049 ***	0.921	0.057 ***
LN_land_area_acres_nb	-0.123	0.048 **	-0.104	0.047 **	-0.109	0.054 **
Age	0.000	0.001	0.000	0.001	0.001	0.001
_cons	5.706	0.569 ***	6.093	0.554 ***	5.644	0.642 ***
<Fixed-effect>						
Property type	yes		yes		yes	
Year	yes		yes		yes	
No. Obs.	523		461		362	
R-squared	0.81		0.83		0.84	
Root MSE	0.5151		0.4920		0.4909	

7. Empirical results (ix): Return

Dependent var = YoY return measured for quarter frequency	QTR_RETURN (+5quarter)		QTR_RETURN (+6quarter)		QTR_RETURN (+7quarter)		QTR_RETURN (+8quarter)	
	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.
<Independent Variables>								
INVACC	-0.042	0.010 ***	-0.095	0.009 ***	-0.149	0.010 ***	-0.191	0.012 ***
dum_forbuyer	-0.032	0.008 ***	-0.073	0.007 ***	-0.113	0.008 ***	-0.147	0.010 ***
INVACC×dum_forbuyer	0.033	0.014 **	0.086	0.014 ***	0.144	0.015 ***	0.188	0.017 ***
LN_Sqft	0.000	0.000 ***	0.000	0.000 ***	0.000	0.000 **	0.000	0.000 ***
LN_land_area_acres_nb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Age	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Past YoY return (t-1, ⋯, t-8)	(Suppressed)		(Suppressed)		(Suppressed)		(Suppressed)	
_cons	0.107	0.009 ***	0.128	0.013 ***	0.097	0.015 ***	0.120	0.017 ***
<Fixed-effect>								
Property type	yes		yes		yes		yes	
Year	yes		yes		yes		yes	
Property location country	yes		yes		yes		yes	
Buyer country	yes		yes		yes		yes	
Seller country	yes		yes		yes		yes	
Buyer capital group	yes		yes		yes		yes	
Seller capital group	yes		yes		yes		yes	
Buyer capital type	yes		yes		yes		yes	
Seller capital type	yes		yes		yes		yes	
Property Location-Buyer Country								
No. Obs.	22241		21184		20073		19043	
R-squared	0.80		0.81		0.80		0.81	
Root MSE	0.0202		0.0194		0.0199		0.0197	

8. Discussion

- Impact associated with *dum_forbuyer* seemes too large
  - Difference in quality (#floor, more detailed address, and more???)
- In the baseline case, more than 2 STD of *INVACC* is required to offset the positive impact associated with *dum_forbuyer* (can we really say "short-term phenomenon"?)

- Ongoing works:
  i. Matched sample for other countries
  ii. Precise measures for return (e.g., RCA commercial property index)
  iii. Buyers' financial condition (esp., funding after the 2008-09 crisis)
  iv. Distance b/w location & buyer (differentiating *dum_forbuyer*)
  v. IV for *dum_forbuyer* & *INVACC* (e.g., distance, price change)
  vi. Time-series property of β (⇒shock transmission)
  vii. year × location dummy
  viii. Core/Value-added indicator
  ix. Liquidity condition

9. Conclusion and (many) more

- Summary
  - "Overpricing" of foreign investors
  - Magnitude of the overpricing ↓ over the course of the accumulation of investment experiences in local markets

- Future studies in addition to the assignments
  - Price spillover (⇒related to this study)
  - Location choice
  - Shock transmission
  - Domestic buyers (e.g., lean on/crowded out)

Thank you and comments are welcome!

<Contact Information>
Daisuke Miyakawa:
Associate Professor
Graduate School of International Corporate Strategy,
Hitotsubashi University
2-1-2 Hitotsubashi, Chiyoda-ku, Tokyo, 101-8439 Japan
E-mail: dmiyakawa@ics.hit-u.ac.jp
Web: https://sites.google.com/site/daisukemiyakawaphd/

Chihiro Shimizu:
Professor
Institute of Real Estate Studies,
National University of Singapore
21 Heng Mui Keng Terrace, #04-02, Singapore 119613
E-mail: cshimizu@nus.edu.sg

Iichiro Uesugi:
Professor
Institute of Economic Research,
Hitotsubashi University
2-1 Naka, Kunitachi, Tokyo, 186-8603 Japan
E-mail: iuesugi@ier.hit-u.ac.jp
Web: http://www.ier.hit-u.ac.jp/English/faculty/uesugi.html