Unravelling liquidity in direct real estate

An international comparative study

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A number of related research questions

- How does liquidity affect prices?

- How does liquidity affect transaction activity?

- How do prices affect transaction activity?

- How does transaction activity affect prices?

- What are the key determinants of transaction activity?

- What are the key determinants of prices?

- Empirical investigation encounters major problems of reverse causality and joint determination, while suitable instrumental variables are hard to find and justify. We examine variation in yields and activity using separate models and VAR models.

Prior literature

- Investigation of links between investment flows and returns:

  - Fisher et al. (2009) for US and Ling et al. (2009) for UK

- Testing determinants of cross-border capital flows:

  - Lieser & Groh (2014), Fuerst et al. (2015) and McAllister & Nanda (2016) among others

- Association between foreign investor activity and yields:

  - McAllister & Nanda (2015, 2016) for US and Europe

- Theoretical discussion of determinants of trading activity:

  - Fisher et al. (2003) and Clayton et al. (2008) among others

General framework
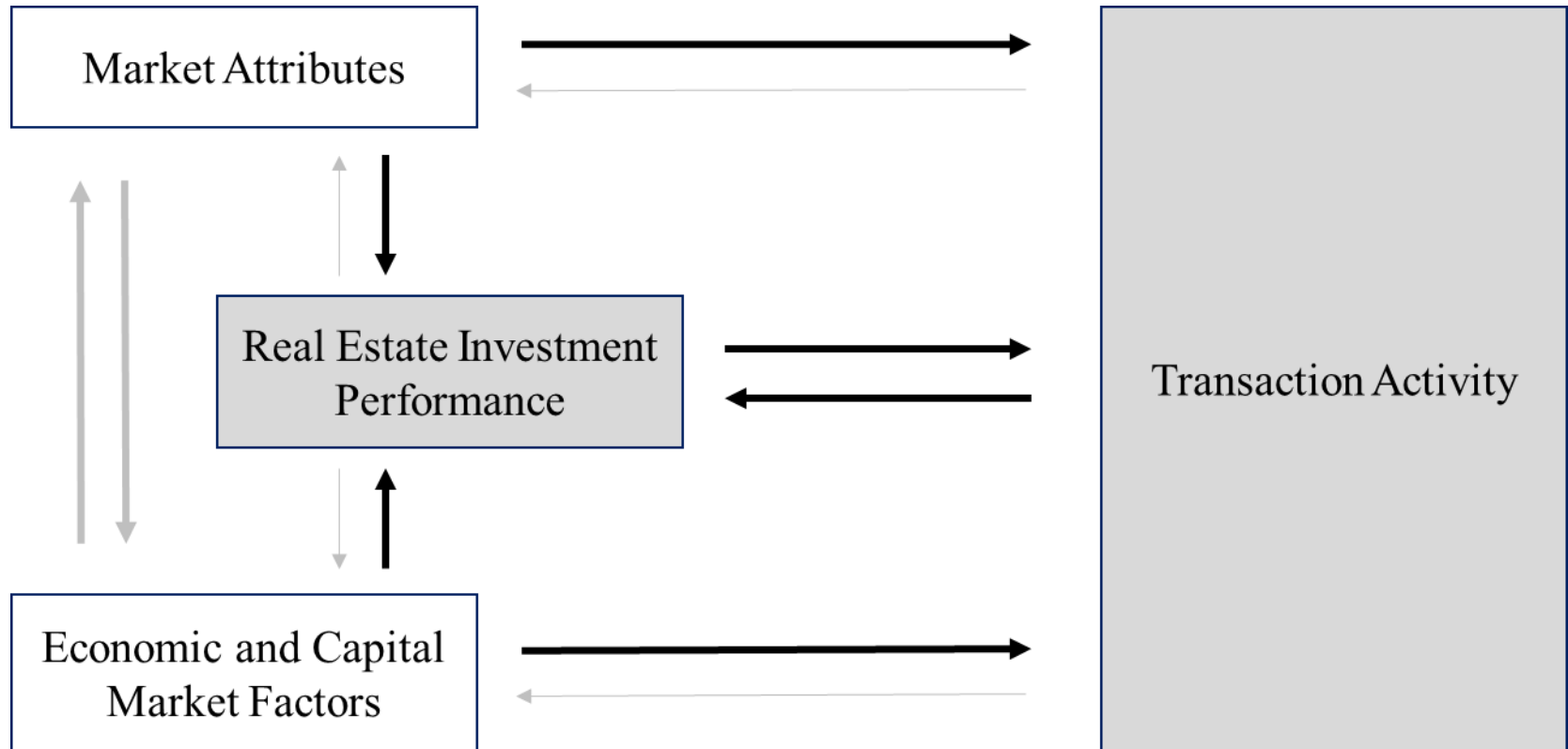
Market attributes: Transaction costs, Market maturity, Market size, Stock growth, Market regulation. Economic and capital market factors: Economic growth, Global economic integration, Quality of institutions, Institutional investment market, Capital market conditions, Current account balance, Debt availability, Exchange rate.

Data sources and study period

- We focus on trading activity and relationships between activity and yields over 2007-2015, extending earlier IPF funded work

  - CBRE supplied data on yields, rents and stock for office markets in 33 individual cities

  - RCA supplied data on the value and floorspace of office properties traded in those same 33 cities

- We estimate turnover rates to control for market size and see which markets were most actively traded

  - Floorspace traded as % of total stock

  - Value traded as % of estimated stock value
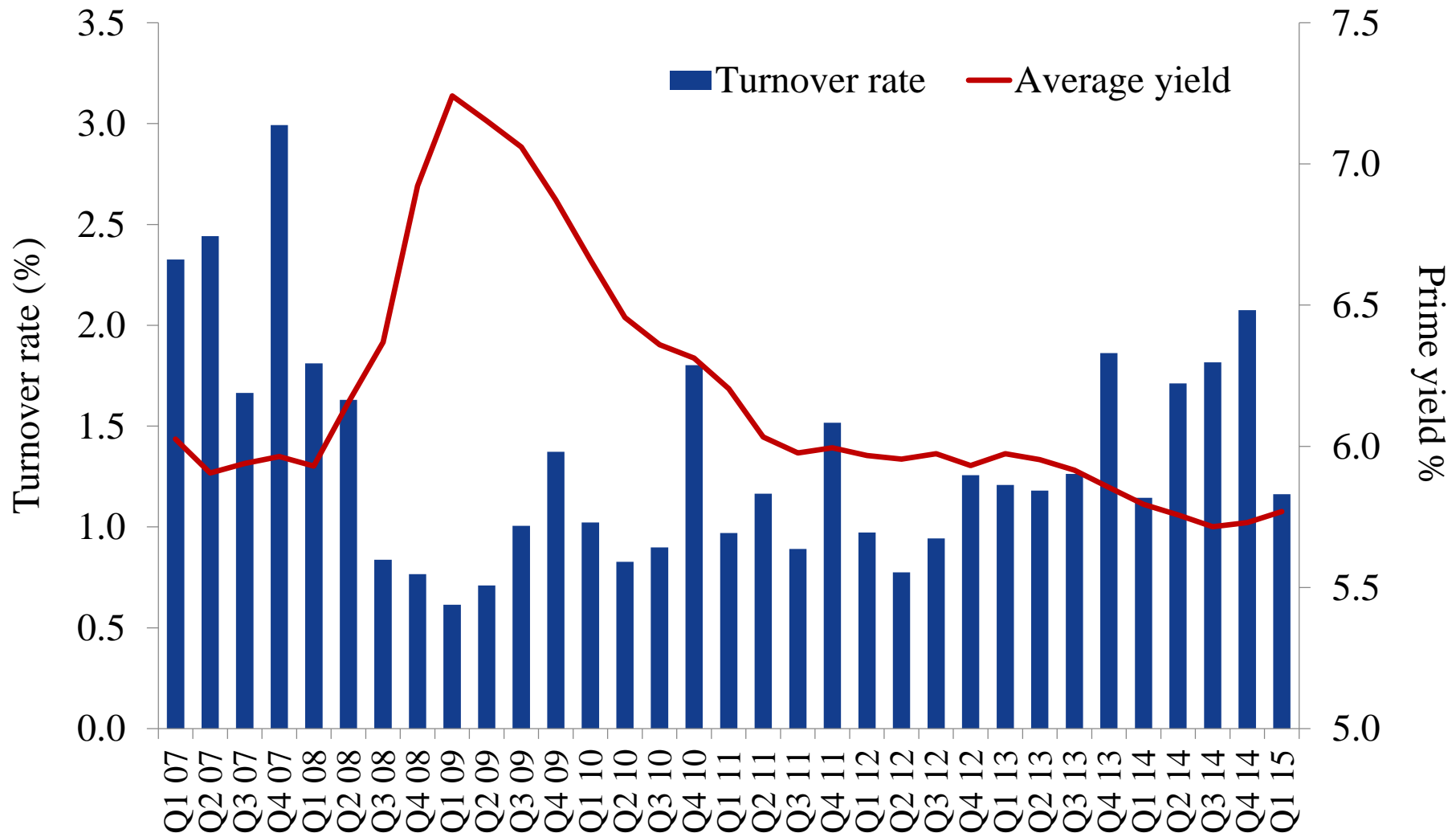
Ranking – average turnover rate

Floorspace based turnover rate (% per annum)

City	Rate	City	Rate	City	Rate
Seoul	21.0	Shanghai	7.3	Barcelona	2.8
San Francisco	19.2	Warsaw	6.3	Paris	2.6
Chicago	18.3	New York	5.9	St Petersburg	2.6
Beijing	15.2	Singapore	5.5	Madrid	2.5
Sydney	14.5	Frankfurt	4.4	Tokyo	2.4
Melbourne	13.4	Istanbul	4.2	Berlin	2.3
Boston	10.6	Moscow	3.9	Munich	2.3
London	9.5	Stockholm	3.9	Rotterdam	2.3
Manchester	8.9	Amsterdam	3.5	Lyon	2.1
Los Angeles	8.4	Hong Kong	3.4	Gothenburg	2.0
Washington DC	7.4	Osaka	3.2	Sofia	1.7

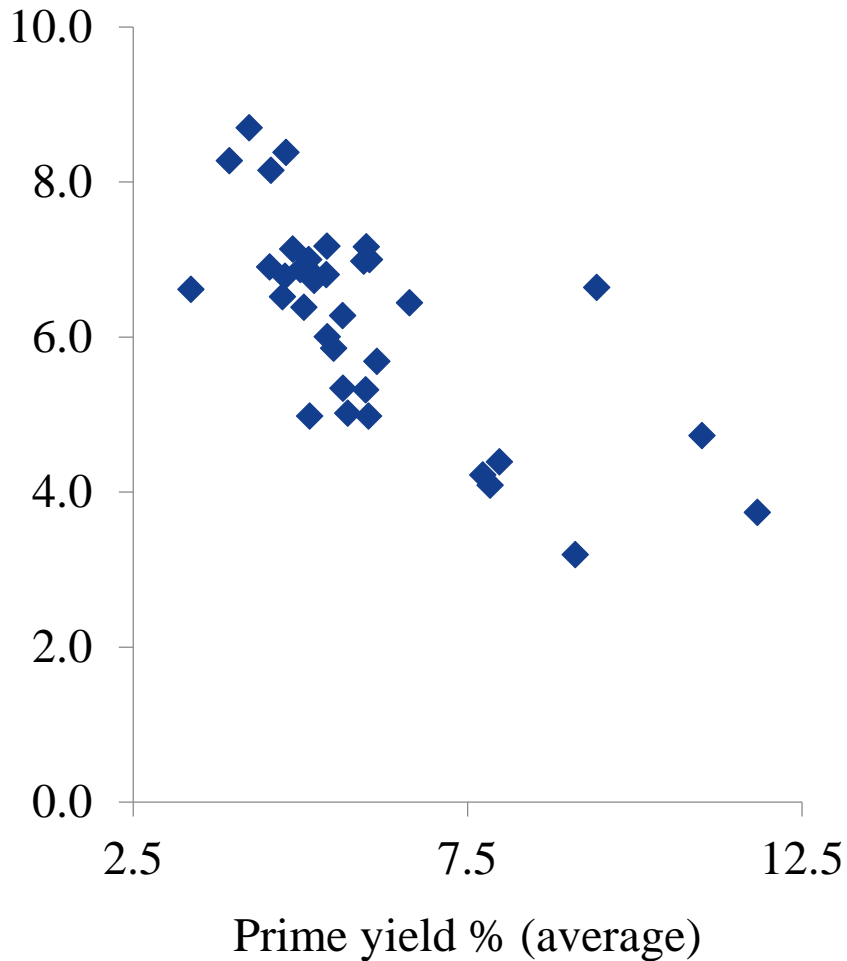# Aggregate volume and average yield
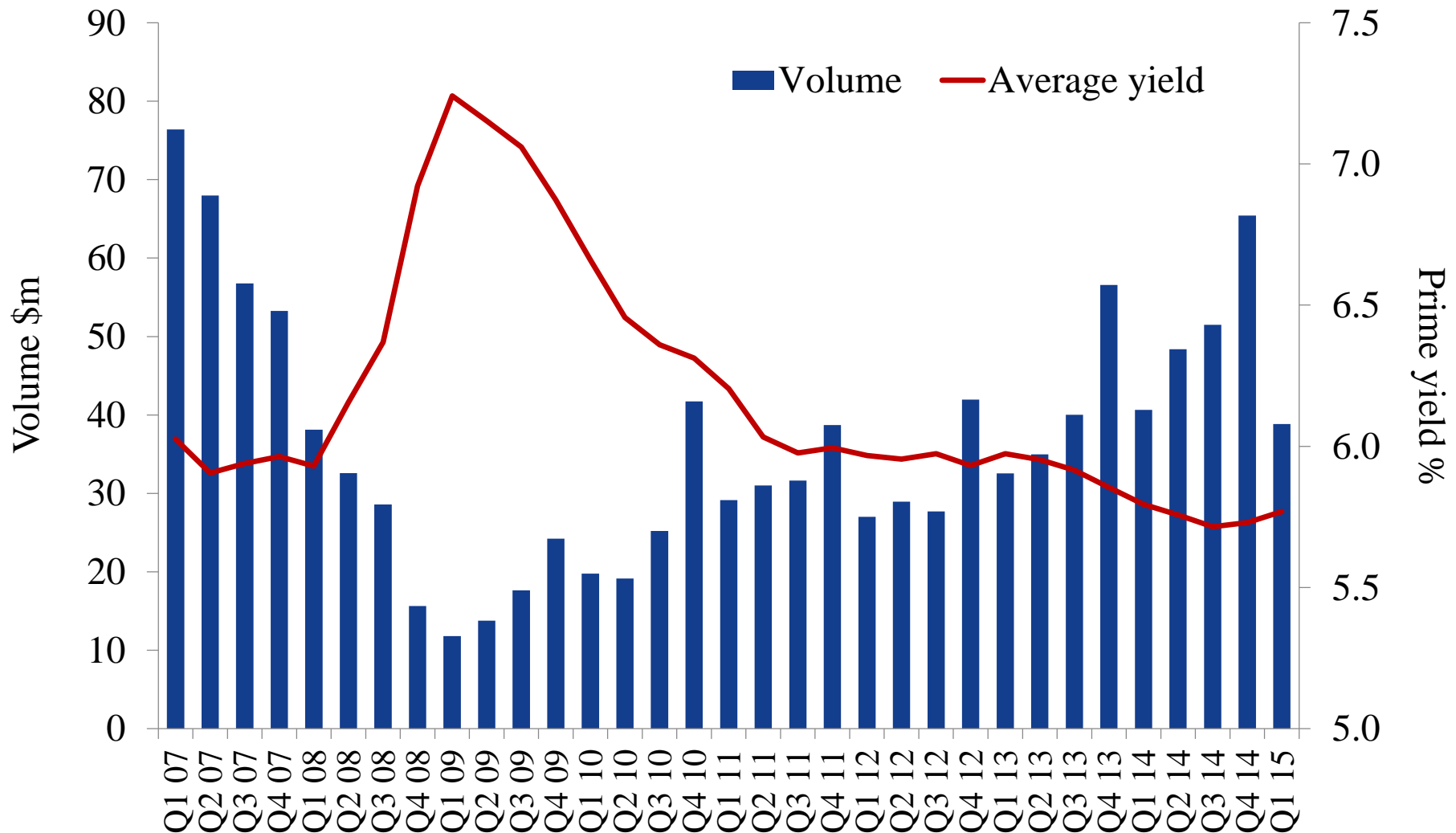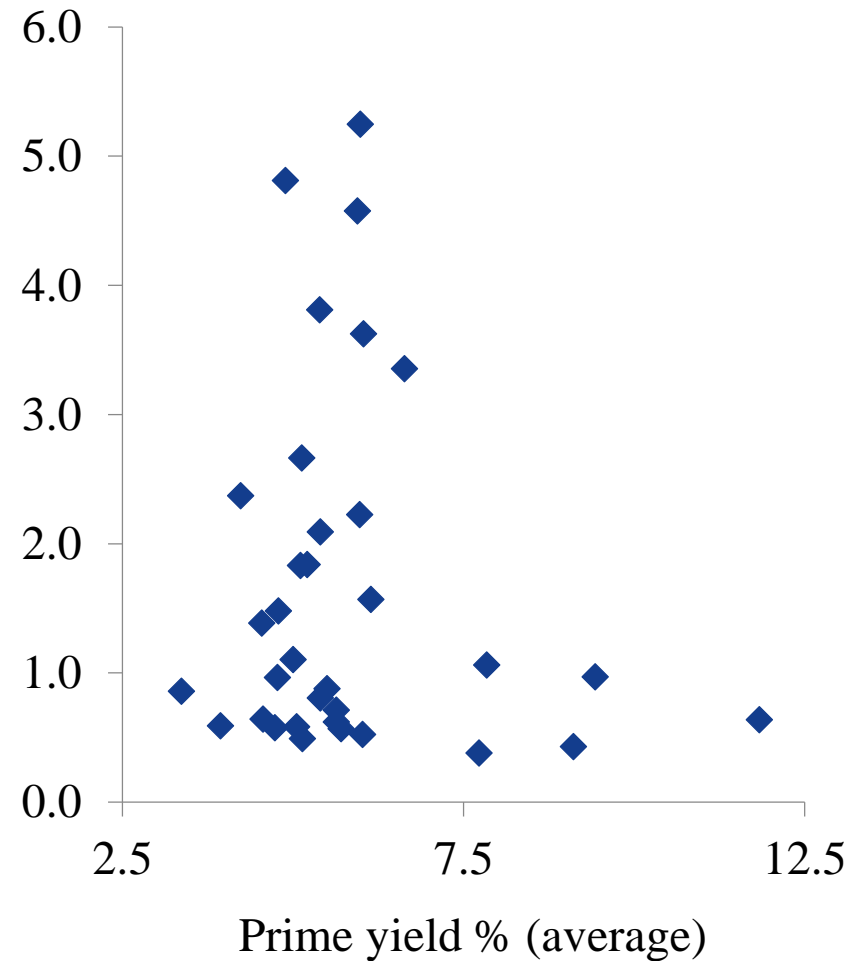
Average turnover and average yield

Yields and trading activity by city

Average volume (log scale)

Turnover rate (%)

Econometric analysis

- We model yield determinants in line with established literature. Similar to national studies, key determinants are risk free rates, risk premiums and expectations of cash flow growth.

- We model determinants of transaction activity as a function of both economic and office market variables.

- Finally, using a panel VAR, we model the dynamic relationship between yields and transaction activity for our sample of office markets.

- We model the data at both quarterly and semi-annual frequency owing to varying availability and quality of variables.

Dependent variable: **Prime yield**

Quarterly data	OLS		GLS	
Constant	3.36	***	3.71	***
Real govt bond yield	0.06	***	0.03	***
Stock market volatility	0.21	***	0.10	***
Real rent trend deviation	-0.11		-0.47	***
City fixed effects	YES		YES	
Quarter dummies	NO		NO	
Cities	27		27	
Observations	881		881	

Semi-annual data	OLS		GLS	
Constant	3.37	***	3.57	***
Real govt bond yield	0.05	**	0.02	**
Stock market volatility	0.21	***	0.15	***
Real rent trend deviation	-0.47		-0.72	***
City fixed effects	YES		YES	
Half year dummy	NO		NO	
Cities	33		33	
Observations	505		505	

Dependent variable:	VB turnover rate		FB turnover rate	
Quarterly data	OLS	GLS	OLS	GLS
Constant	2.20 ***	2.62 ***	2.24 ***	2.55 ***
Stock market volatility	-0.03	-0.06 ***	-0.03	-0.07 ***
Real rent trend deviation	-0.61	-0.28	0.46	0.65 *
Real GDP growth y-o-y	0.13 ***	0.05 ***	0.10 ***	0.04 ***
City fixed effects	YES	YES	YES	YES
Quarter dummies	YES	YES	YES	YES
Cities	25	25	27	27
Observations	783	783	847	847
Semi-annual data	OLS	GLS	OLS	GLS
Constant	4.85 ***	5.32 ***	5.04 ***	5.42 ***
Stock market volatility	-0.14	-0.14 ***	-0.18 **	-0.19 ***
Real rent trend deviation	-0.01	0.78	2.67	2.45 ***
Real GDP growth y-o-y	0.24 ***	0.10 ***	0.23 ***	0.09 ***
City fixed effects	YES	YES	YES	YES
Half year dummy	YES	YES	YES	YES
Cities	31	31	33	33
Observations	445	445	513	513

Panel VAR models: semi-annual data

Model 1	Prime yield		VB turnover rate
L1. Yield	0.62 ***	L1. Yield	-7.13 **
L2. Yield	-0.30 **	L2. Yield	-3.00
L1. Turnover	0.00	L1. Turnover	0.07
L2. Turnover	0.01	L2. Turnover	0.05

Exogenous variables: Real bond yield, stock market volatility, real rent deviation, real GDP growth

Cities	31	
Observations	350	

Model 2	Prime yield		FB turnover rate
L1. Yield	0.77 ***	L1. Yield	-4.39 **
L2. Yield	-0.25 **	L2. Yield	-1.70
L1. Turnover	0.00	L1. Turnover	0.01
L2. Turnover	0.02 *	L2. Turnover	0.04

Exogenous variables: Real bond yield, stock market volatility, real rent deviation, real GDP growth

Cities	33	
Observations	374	

Conclusions

- There are complex interrelationships between liquidity, prices and transaction activity

- Standard models of yield determination and the conventional yield determinants work well with a heterogeneous sample of international cities.

- Models of transaction activity are less robust with varying size and statistical significance of coefficients across alternative specifications.

- Limited evidence of short-term lead-lag relationships between prices and transaction activity, and vice versa, based on semi-annual data only.

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Unravelling liquidity in international commercial real estate markets is available at:

http://www.ipf.org.uk/resourceLibrary/unravelling-liquidity-in-international-commercial-real-estate-markets--march-2016--summary-report.html