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DETERMINANTS OF RENTAL GROWTH IN CHINA'S LOGISTICS REAL ESTATE MARKET

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ABSTRACT

The investment and occupier markets for modern logistics facilities in China's largest cities have boomed in recent years. With a transaction volume of over USD 10.4 Billion in 2020 alone, China has emerged as one of the World's largest logistics real estate markets globally. We apply error correction model (ECM) analysis to examine quarterly rent, supply, vacancy and economic data of nine cities in China over the past 12 years. We find the rent growth is mainly driven by GDP growth and land price, while the national-level vacancy rate does matter to the logistics real estate market, logistics real estate in tier 1 and tier2 cities have different rent determinates. There is an effective self-correction mechanism in logistics rent dynamics. The vacancy rates are mainly influenced by supply change, while supply increase has very limited connection with rent growth or vacancy rate. A wide range of rental growth performances is evident by city across China with supply-constrained coastal markets generally experiencing the strongest rental growth. This is among the first research papers to examine the drivers of rental growth and vacancy in Chinese logistics real estate markets.

Keywords: Logistics Real Estate, Rent Growth, Demand Drivers, ECM

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1. Introduction

In recent years, the investment and occupier markets for modern logistics facilities in China's largest cities have expanded rapidly, yet much less literature has emerged in a Chinese context. With a transaction volume of over USD 10.4 Billion in 2020 alone, and an even greater volume year-to-date (24 November 2021) for the year 2021, China has emerged as one of the World's largest logistics real estate markets globally. While there has been wide ranging research in China in commercial real estate (for example Ke & White, 2009; Ke & Wang, 2016), there has been little or no recent research on the modern logistic real estate sector there.

There has been a series of research on logistics real estate, focusing on its function, spatial patterns, logistic real estate sprawl and other issues. For its function, logistics real estate has been proved to help goods delivery (Freichel et al., 2019) and third-party logistics providers (Baglio, Martina, et al.,2021). The connection of logistics real estate and relevant growth issues were studied, including the role of regional planning (Raimbault,2019), land use zoning (Wagner,2010), E-commerce growth (Zhang et al.,2016) and the financialization process (Raimbault, 2021), while the return performance of logistics REITs was also studied recently (Lin et al.,2020).

Locational attributes of logistics real estate research have been undertaken to understand the spatial distribution of logistics real estate assets. These include Geographic Information System (GIS) is an effective tool to examine this issue (Sarkar, 2007), while the spatial pattern of logistic real estate was studied in different cities in the world, including Central Mexico (Diziain et al.,2010), Greater Paris (Diziain et al, 2012; Raimbault et al.,2012) and Gothenburg (Heitz et al., 2020). Apart from the existing logistic real estate, the process of how industrial submarkets expand and sprawl was examined in different cities, including Toronto (Woudsma et al.,2016), Paris, Frankfurt, Kassel (Barbier, et al.,2019) and Brussels (Strale, 2020).

This paper aims to identify logistics real estate rent growth determinants in major Chinese cities. We find rent growth is mainly driven by GDP growth and land price, national-level vacancy rate does matter to the logistic real estate market and there is an effective self-correction mechanism in logistics rent dynamics. Logistics real estate in tier 1 and tier 2 cities have different rent determinates. The vacancy rates are mainly influenced by stock change, while stock increase has very limited connection with rent growth or vacancy rate. This is among the first research papers to examine the drivers of rental growth and vacancy in Chinese logistics real estate markets. This paper is organized as follow; following this introduction, the second part is a literature review on China logistics research, then follows the methodology and data in parts 3 and 4 respectively, part 5 shares the results, and finally we provide conclusions and discussion of the property implications of the research.

2. Literature Review on China Logistics research

Recent research on China logistics focuses on several broad topics and these include Third-party logistics, logistics companies and assets, logistics development and its influence on the economic and society, logistic efficiencies and sustainable development.

Third-party Logistics: Previous research on third-party logistics (3PL) includes market overviews, performance, industry growth and supply (Chu et al.,2012) and demand-side drivers (Shi et al.,2016), and the role

of trust in outsourcing (Tian et al.,2008, Chen et al., 2010) of third-party logistics were examined. While other research focused on its performance drivers (Wang et al.,2010), and the influence of technological advancements (Wang et al.,2008).

Logistic Companies and Assets: For logistic companies, previous research has examined operations (Liu et al., 2015), cost management (Song & Wang, 2009), strategy (Spillan et al.,2013), value creation (Li et al.,2010) and talent management (Shi & Handfield,2012). For assets, logistics centre (Chen et al., 2017) and underground logistic systems (Yang et al.,2020) have been studied, while the spatial distribution pattern of logistic assets has been examined between and within cities (Jing et al., 2010; Li et al.,2020).

Logistics development and its influence in Economic and Society: In the early years of the 21st century, logistics development in China got the attention of researchers who realized this sector was at the very start of its growth trajectory (Jiang & Prater, 2002; Goh & Li, 2003), while very recent impacts from the Covid-19 pandemic also have also influenced its development (Liu et al., 2020). The impact of logistics networks on regional development (Qi et al.,2020) and other industries (Gao et al.,2018) has been examined while its influence on economic growth was also examined at the national level (Liu, 2009; Lean et al., 2014).

Logistic Efficacy and Sustainable Development: Sustainable development is an emerging issue in logistic research and will no doubt attain greater importance going forward. Researchers have examined logistic sustainability at the province and city levels (Tan et al., 2019; Lan et al.,2020). The carbon emission arising from the logistics industry in China is also getting attention from researchers (Guo et al.,2016; He et al.,2017).

3. Method

We use an ECM framework to identify the long-run equilibrium and short-run adjustments of rent and vacancy rate. This model is widely used in the analysis in office market in London (Hendershott et al., 2010), Shanghai (White & Ke, 2014).

We assume the demand for real estate space can be expressed as a Cobb-Douglas function, then:

$$D(R, E) = \lambda_0 R^{\lambda_r} E^{\lambda_e}$$

Where R is the real effective rent, E is Demand variable, we use GDP in this paper; then we get:

$$D(R^*, E) = (1 - v^*)S$$

Where S is the total supply of logistic real estate space, R^* and v^* is the long-run equilibrium effective real rent and vacancy rate. However, as stock and GDP are highly correlated, multicollinearity might occur if we put GDP and stock in rent model directly. So we use first order differenced log value of stock, which is Supply, (the rate of stock increase in each period).

We use historical market data of R and E to estimate the Equation above then we get, and we assume general industry land price may also influence the logistics real estate supply and rent growth:

$$\ln R_t = \alpha_0 + \beta_1 \ln GDP_t + \beta_2 Supply_t + \beta_3 Vacancy_t + \beta_4 \ln Landprice_t + \varepsilon_t$$

Then in the short term, the adjusted model for rent, vacancy rate is

$$\Delta \ln R_t = \alpha_1 + \beta_5 \Delta \ln GDP_t + \beta_6 \Delta Supply_t + \beta_7 \Delta Vacancy_t + \beta_8 \Delta \ln Landprice_t + \beta_9 ECMR_{t-1} + \gamma_{1t}$$

Following previous research, we assumed vacancy rate change is influenced by its previous period value and the previous period rent gap (ECMR):

$$\Delta \text{Vacancy}_t = \alpha_4 + \beta_{10}\text{Vacancy}_{t-1} + \beta_{11}\Delta \ln \text{GDP}_t + \beta_{12}\Delta \ln \text{Supply}_t + \beta_{13}\text{ECMR}_{t-1} + \gamma_{2t}$$

And we assume that Supply changes are influenced by GDP growth, previous three period values of rent gap and vacancy rate (Chau & Wong, 2016).

Then in the short term we adjust the model for the stock

$$\Delta \ln \text{Supply}_t = \alpha_3 + \beta_{14}\Delta \ln \text{GDP}_t + \beta_{15}\text{Vacancy}_{t-3} + \beta_{16}\text{ECMS}_{t-3} + \gamma_{3t}$$

4. Data

4.1 Data and Resource

We examine major logistics real estate markets in nine major Chinese cities, which includes four Tier1 Cities (Shanghai, Beijing, Shenzhen, Guangzhou) and five Tier2 Cites (Chongqing, Chengdu, Hangzhou, Tianjin and Ningbo). The total combined GDP of these nine cities is 20.95% of China's national total in 2020 (and their combined population share is 11.53%). The relative importance of this subset of nine cities is even greater than their national share of population and GDP implies for regarding logistics real estate the net space absorption in these 9 cities was over 56% of China's total national absorption in 2020. We also calculate the stock-weighted rent and economic variables in all cities and tier1/ tier2 cities. Our logistic real estate data is from CBRE, economic data is from the National Bureau of Statistics of China (NBS). Most variables passed the stationarity test and cointegration test, making them suitable for time-series analysis (detailed results reported in the appendix).

In Fig 1 and Fig 2, we show average rent and vacancy rate of the combined nine cities in China, and these two variables in tier 1 and tier 2 cities separately. In Fig 3, we show the supply and demand variable of the Tier1 and Tier 2 cities in this study; all variables are weighted by stock size of each city at each year.

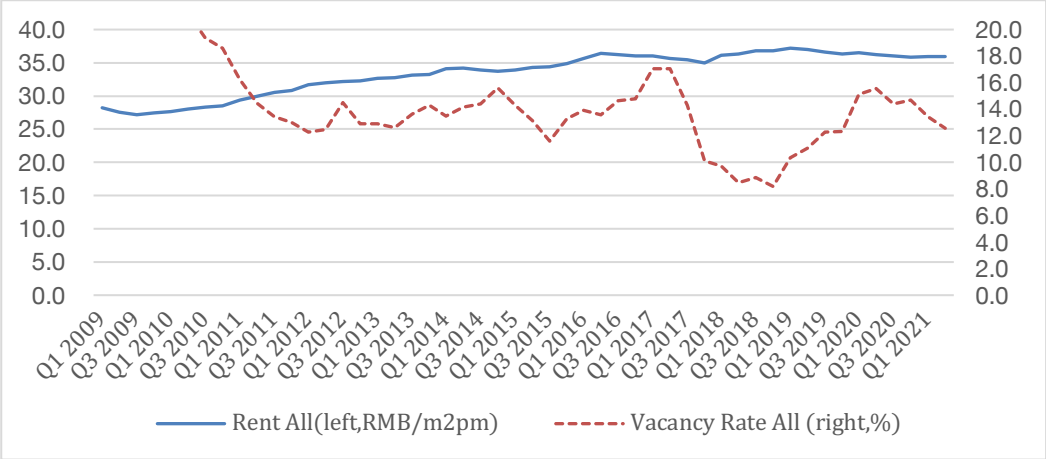


Fig 1 Average Rent and Vacancy rate of 9 cities in China

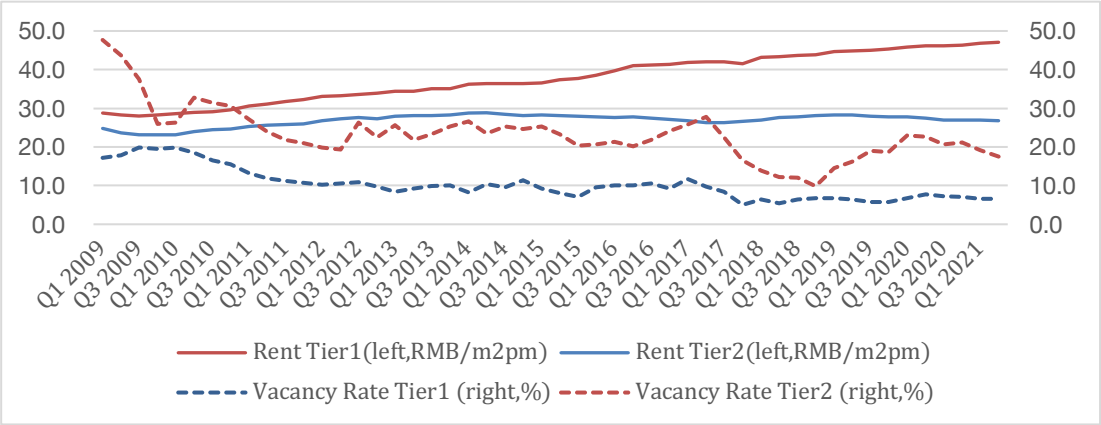


Fig 2 Rent and Vacancy Rate in Tier1 and Tier2 Cities

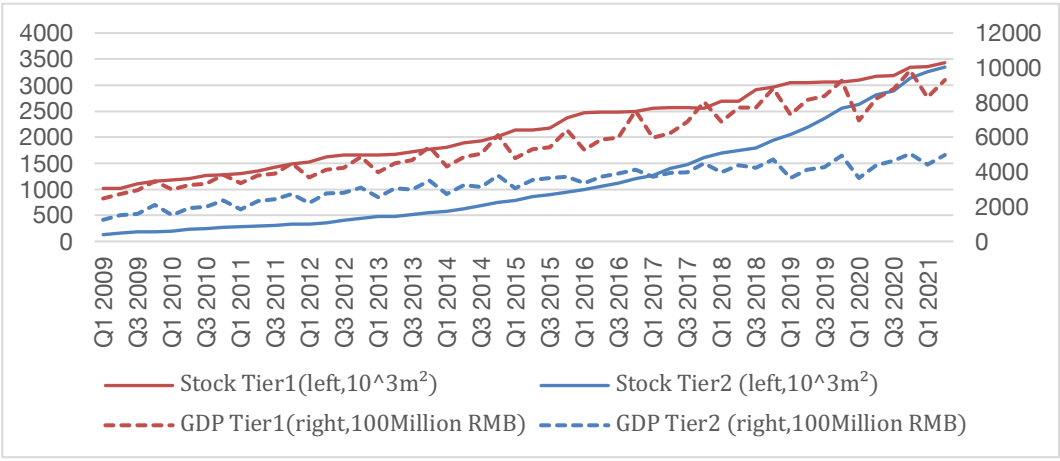


Fig 3 Total Stock and GDP in Tier1 and Tier2 Cities

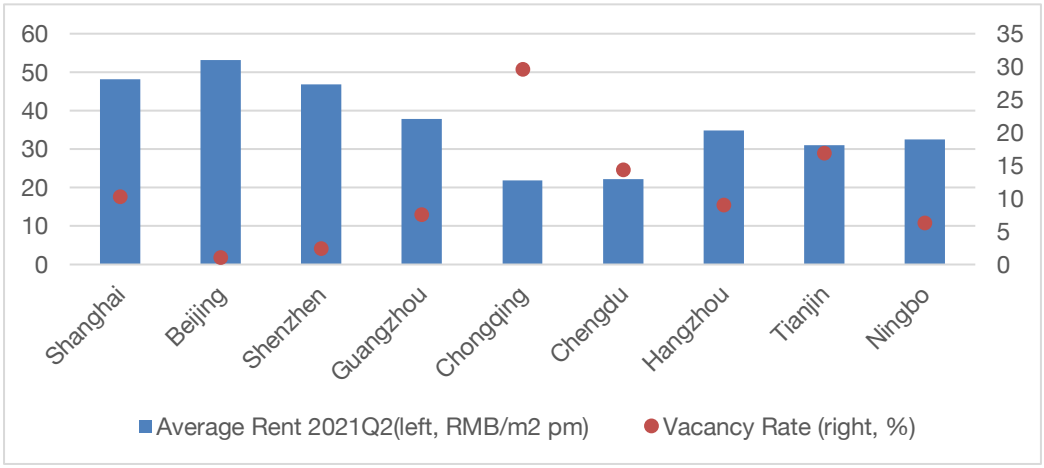


Fig 4 Logistics rent level and vacancy rates for each City in the study (Q2 2021)

4.2 Logistics Real Estate Performance Analysis

We showed the logistics real estate rent and vacancy rate of the nine cities in 2021Q2 in fig 4. We compare it with key economic variables such as GDP growth rate and CPI increase. Fig 5 shows Tier1 cities see higher rent growth and lower average vacancy rate, while the total stock change is much higher in tier 2 cities.

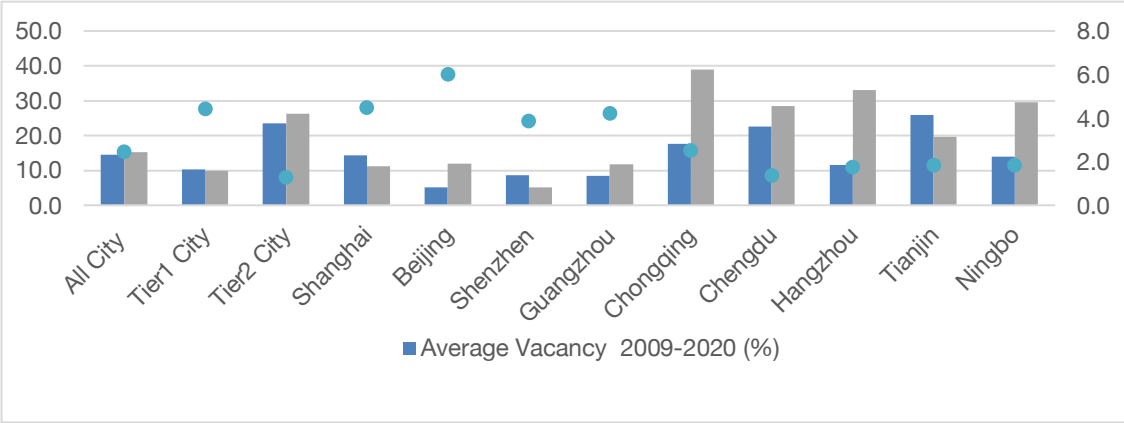
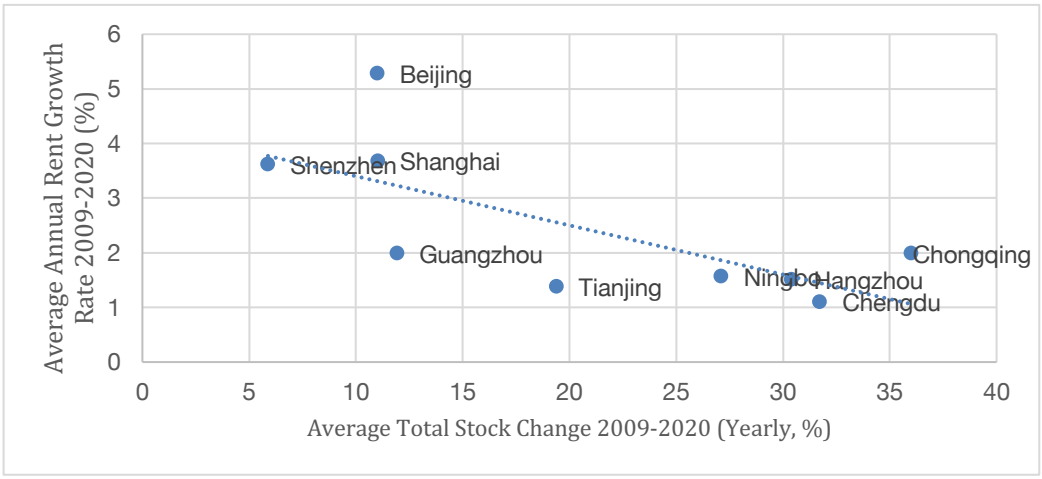
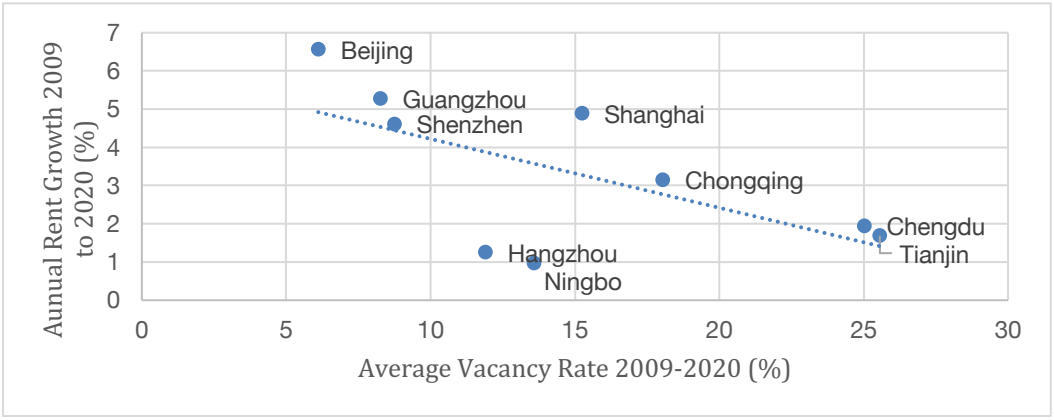


Fig 5 Logistics real estate rent growth, stock change and vacancy rate from 2009 to 2020

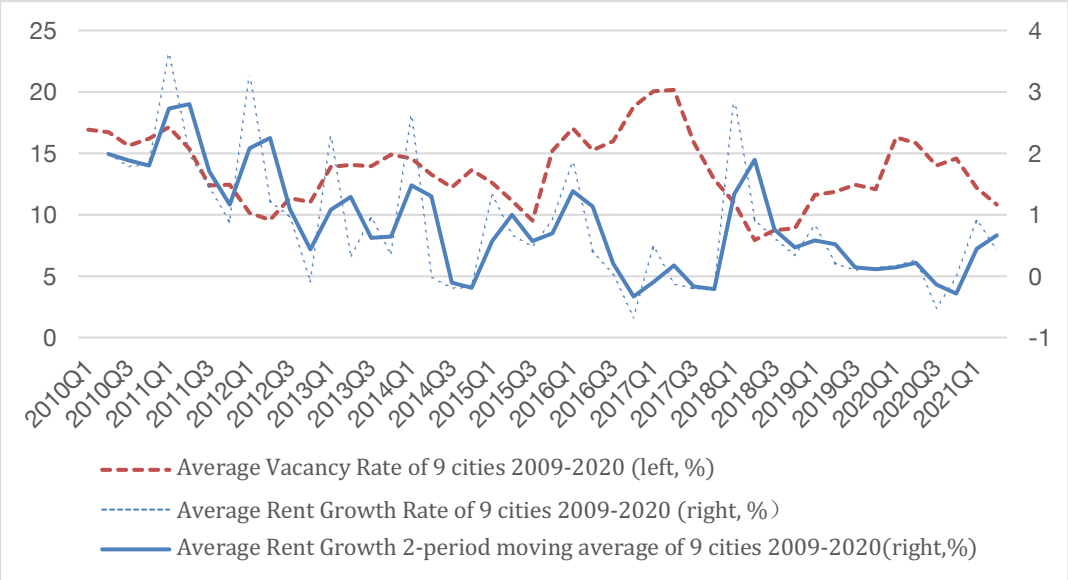
We further analyzed the correlation between rent growth and other variables. Fig 6 shows negative correlations with total stock change and average vacancy rate were found.



A. Rent Growth and Total Stock Change



B. Rent Growth and Average Vacancy Rate



C. Rent Growth and Vacancy Rate are negatively correlated in different period

Fig 6 The Correlation of Rent Growth and Other Variables

5. Results

5.1 Rent Model Estimation

We estimate the determinants of the long-term rent model with all city average data and tier 1 and tier 2 city data. Logistics real estate rent growth is mainly driven by GDP (tier 1 cities) and land price increase (tier 2 Cities). Whereas national-level vacancy rate does matter to the logistic real estate market, there is an effective self-correction mechanism in logistics rent dynamics. We only show here the results of the all city and tier1 and 2 city analyses here, more detailed results of 9 cities analysis reported in appendix, the findings are very similar.

Table 1 Rent Determines Model Analysis Result

VARIABLES	All_city	Tier1_city	Tier2_city
gdp	0.178***	0.414***	-0.110
	(0.051)	(0.049)	(0.084)
vacancy	-0.389**	-0.139	-0.147
	(0.147)	(0.151)	(0.148)
supply	-0.139	-0.182	-0.106
	(0.215)	(0.131)	(0.162)
land_price	0.203**	0.045	0.370***
	(0.084)	(0.056)	(0.128)
Constant	0.630**	-0.251	1.941***
	(0.246)	(0.158)	(0.266)
Observations	49	49	49
R-squared	0.940	0.985	0.627

Note: *, **and ***stand for the 10, 5 and 1% significance levels, respectively.

Table 2 Rent Adjust Model Analysis Result

VARIABLES	All_city	Tier1_city	Tier2_city
dgdp	0.073*	0.094**	0.025
	(0.043)	(0.040)	(0.031)
dvacancy	0.030	0.078	0.094
	(0.124)	(0.132)	(0.066)
dsupply	-0.066	-0.064	-0.021
	(0.065)	(0.051)	(0.038)
dland_price	0.063	-0.018	0.196**
	(0.052)	(0.046)	(0.074)
ecm_1	-0.175**	-0.205**	-0.071
	(0.072)	(0.086)	(0.055)
Constant	0.004*	0.009***	0.000
	(0.002)	(0.002)	(0.002)
Observations	48	48	48
R-squared	0.216	0.166	0.186

Note: *, **and ***stand for the 10, 5 and 1% significance levels, respectively.

5.2 Stock and Vacancy Rate Adjust Model

Table 3 shows that vacancy rates are mainly influenced by supply change and the lagged value of the vacancy rate, supply increases have direct influence on vacancy rates, this is similar to previous research on the office market.

Table 4 shows our short-term supply does not get much influence from vacancy rate or rent gap, which indicates supply might adjust well to market conditions, very likely to be driven by the construction process or land supply.

Table 3 Vacancy Rate Change Determinants

VARIABLES	All_city	Tier1_city	Tier2_city
vacancy_1	-0.128**	-0.078*	-0.218***
	(0.056)	(0.045)	(0.067)
dsupply	0.176**	0.151***	0.235***
	(0.071)	(0.052)	(0.070)
dgdp	-0.007	-0.005	0.044
	(0.050)	(0.045)	(0.067)
ecm_1	0.100	0.154	0.104
	(0.083)	(0.094)	(0.109)
Constant	0.016**	0.006	0.044***
	(0.008)	(0.005)	(0.016)
Observations	48	48	48
R-squared	0.241	0.253	0.405

Note: *, **and ***stand for the 10, 5 and 1% significance levels, respectively.

Table 4 Logistics Stock Short-term Adjust Model

VARIABLES	All_city	Tier1_city	Tier2_city
dgdp	-0.125	0.035	-0.245*
	(0.094)	(0.120)	(0.131)
vacancy_3	0.056	-0.018	0.136
	(0.103)	(0.126)	(0.131)
ecm_3	0.087	0.096	0.009
	(0.160)	(0.248)	(0.224)
Constant	-0.006	0.000	-0.026
	(0.015)	(0.014)	(0.031)
Observations	46	46	46
R-squared	0.045	0.007	0.092

Note: *, **and ***stand for the 10, 5 and 1% significance levels, respectively.

6. Conclusion and Discussion of Implications

We examined the logistic rent, stock and vacancy of logistics real estate markets and the key economic variables from 12 years of quarterly data in nine major cities in China. We found an effective self-adjustment mechanism the in rent and supply process in most cities. GDP growth and land rent influence rent growth, nation-level vacancy rate does matter to the logistic real estate market. We believe that the more supply-constrained coastal markets with sustainable economic growth rates have high rent growth potential in the future as a result of their likely lower vacancy rates.

There are several implications arising from this study. The logistics industry has been expanding rapidly in recent years and yet from a pure real estate performance perspective, surprisingly very little research has been undertaken on this topic. Yet China ranks high as one of the world's largest consumption markets of goods, as a manufacturer and producer of goods and furthermore its e-commerce penetration rate is one of the highest in the world and the magnitude of its ecommerce market is thus far larger than anywhere else in the world.

Thus, the large size and ongoing strong growth of the logistics industry needed both for domestic demand distribution as well as for import/export trade place great pressure on the stock of logistics real estate. Unsurprisingly logistics real estate has become a much sought-after asset class by both domestic and global real assets investors in recent years with over USD 10 billion in logistics asset transaction volumes last year and a similar amount in the first 11 months of 2021 as well. Yet understanding the rental performance dynamics of the markets is critical for investors. Given that China is large and has diverse market dynamics, performance has been uneven as evidence by persistently high vacancy rates and modest rent growth metrics is certain cities – notably those in the western/inland areas of China.

Thus, this study establishes some understanding of rent growth determinants in the main logistics markets of China over the past decade or more, and thus providing some transparency for investors in allocating their capital to those markets with better performance potential, with future aspirations being to forecast the rental growth of

these markets into the future. This research also hints at policy implications as well. Several cities in this study have release vast amounts of land by which to attract developers to build new logistics facilities and thus improve their tax base. But there are limits to the amount of stock that needs to be built, in spite of the strong demand drivers already noted. Overbuilding and oversupply may take years to be absorbed and then at lower rents. But for most of the Tier 1 cities at least, single-digit vacancy rates have spurred attractive average rental growth rates and made them highly attractive to investors and much sought-after by occupiers alike.

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Appendix

Table 5 ADF Test for All Variables

	Rent	GDP	Land Price	Stock	Vacancy
All Cities	-5.249***	-3.546**	-5.688***	-7.913***	-5.639***
Tier1 City	-6.712***	-3.921**	-5.707***	-7.207***	-5.195***
Tier2 City	-5.248***	-3.605**	-7.877***	-8.155***	-5.933***
Shanghai	-7.131***	-9.051***	-6.327***	-5.413***	-7.556***
Beijing	-5.442***	-7.756***	-5.819***	-8.959***	-2.934**I(0)
Shenzhen	-6.377***	-5.984***	-8.170**I(2）	-7.328***	-7.025***
Guangzhou	-4.475***	-7.779***	-3.842**	-8.997***	-6.972***
Chongqing	-4.475***	-9.176***	-3.842**	-9.321***	-6.898***
Chengdu	-5.179***	-3.400**I(0)	-4.402***	-7.366***	-5.762***
Hangzhou	-2.623*	-5.535***	-6.453***	-6.104***	-6.317***
Tianjin	-6.828***	-8.229***	-5.401***	-7.371***	-7.168***
Ningbo	-7.634***	-6.503***	-3.693***I(0)	-8.106***	-6.592***

Note: All variables are I(1) unless stated otherwise, as Stock is I(1), Supply in our rent model, which is the differenced value of stock, should be stationarity

Table 6 Cointegration Test Result of Rent Determines Model and Trace Test Statistics

	None	At most 1	At most 2	At most 3	At most 4	*
All City	96.75	52.46*	30.88	13.14	1.70	1
Tier1 City	98.98	56.69	26.12*	10.08	1.76	2
Tier2 City	117.49	55.13	29.44*	15.84	6.54	2
Shanghai	79.08	38.88*	17.42	6.93	2.29	1
Beijing	133.56	74.55	30.52*	15.16	7.05	2
Shenzhen	120.96	73.14	39.66	16.86*	4.21	3
Guangzhou	92.90	55.74	26.98*	9.08	2.67	2
Chongqing	168.18	82.00	33.37*	7.42	0.40	2
Chengdu	150.31	74.60	29.80*	15.92	5.73	2
Hangzhou	121.72	70.89	32.45*	9.79	0.13	2
Tianjin	105.63	43.30*	24.03	10.29	4.12	1
Ningbo	139.86	81.57	34.50*	11.42	0.02	2

Note: * cointegrating equation(s) at the 0.05 level indicated by Trace test

Table 7 Rent Determinants Model Analysis Result of Nine cities in China

	Shanghai	Beijing	Shenzhen	Guangzhou	Guangzhou	Chengdu	Hangzhou	Tianjin	Ningbo
gdp	0.397***	0.407***	0.315***	0.382***	0.026	-0.362***	-0.046	-0.007	-0.166***
	(0.034)	(0.051)	(0.017)	(0.031)	(0.104)	(0.069)	(0.029)	(0.021)	(0.022)
vacancy	-0.113	-0.267	-0.218	0.145	-0.667***	-0.561***	0.010	-0.079	-0.039
	(0.156)	(0.191)	(0.205)	(0.127)	(0.174)	(0.124)	(0.024)	(0.048)	(0.026)
supply	-0.229	-0.174	0.015	-0.037	0.152*	0.224**	-0.015	-0.011	0.016
	(0.149)	(0.113)	(0.083)	(0.067)	(0.089)	(0.097)	(0.013)	(0.055)	(0.015)
land_price	0.174***	0.303**	0.002	0.040	0.528***	0.733***	0.433***	0.280***	0.620***
	(0.049)	(0.121)	(0.013)	(0.032)	(0.189)	(0.131)	(0.052)	(0.032)	(0.032)
Constant	-1.092***	-2.169***	1.034***	-0.028	-0.135	1.677***	1.150***	1.676***	0.672***
	(0.344)	(0.551)	(0.148)	(0.117)	(0.491)	(0.363)	(0.116)	(0.180)	(0.092)
Obs	49	49	49	49	49	49	49	49	49
R-squared	0.966	0.967	0.974	0.962	0.580	0.611	0.953	0.842	0.954

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 8 Logistics Rent Short-term Adjust Model of the Nine cities in China

	Shanghai	Beijing	Shenzhen	Guangzhou	Guangzhou	Chengdu	Hangzhou	Tianjin	Ningbo
dgdp	0.068	0.045	0.040	0.023	0.007	-0.011	0.031	-0.022	-0.057
	(0.055)	(0.041)	(0.029)	(0.040)	(0.040)	(0.042)	(0.026)	(0.018)	(0.039)
dvacancy	0.113	-0.216	-0.007	0.043	-0.081	-0.059	0.091***	0.032	-0.029
	(0.133)	(0.147)	(0.157)	(0.071)	(0.100)	(0.071)	(0.031)	(0.045)	(0.025)
dsupply	-0.204***	0.001	0.005	-0.015	-0.022	0.042	-0.008	-0.004	0.007
	(0.071)	(0.039)	(0.029)	(0.022)	(0.022)	(0.035)	(0.008)	(0.020)	(0.009)
dland_price	0.004	-0.028	-0.027	-0.161	0.350	0.474**	0.525***	0.028	0.856***
	(0.055)	(0.083)	(0.048)	(0.100)	(0.317)	(0.205)	(0.116)	(0.030)	(0.181)
ecm_1	-0.269***	-0.245***	-0.138	-0.131*	-0.023	-0.105*	-0.660***	-0.142*	-0.647***
	(0.091)	(0.068)	(0.096)	(0.074)	(0.058)	(0.054)	(0.129)	(0.080)	(0.155)
Constant	0.009***	0.013***	0.009***	0.012***	0.001	-0.005	-0.003	0.005**	-0.005
	(0.003)	(0.003)	(0.003)	(0.003)	(0.006)	(0.004)	(0.003)	(0.002)	(0.003)
Observations	48	48	48	48	48	48	48	48	48
R-squared	0.263	0.296	0.082	0.132	0.106	0.182	0.543	0.109	0.426

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 9 Vacancy Rate Change Determinants of the Nine cities in China

	Shanghai	Beijing	Shenzhen	Guangzhou	Guangzhou	Chengdu	Hangzhou	Tianjin	Ningbo
vacancy_1	-0.071	-0.138***	-0.049	-0.227**	-0.089	-0.114*	-0.189**	-0.085	-0.358***
	(0.043)	(0.046)	(0.046)	(0.096)	(0.063)	(0.064)	(0.086)	(0.058)	(0.120)
dsupply	0.241***	0.100***	0.075***	0.062	0.097***	0.237***	0.007	0.249***	0.030
	(0.069)	(0.034)	(0.025)	(0.045)	(0.028)	(0.066)	(0.035)	(0.054)	(0.048)
dgdp	-0.054	-0.016	0.049*	-0.035	-0.007	0.034	-0.073	-0.001	-0.373*
	(0.062)	(0.042)	(0.027)	(0.078)	(0.058)	(0.087)	(0.122)	(0.063)	(0.206)
ecm_1	0.169*	0.080	-0.120	0.251*	-0.242***	0.056	0.886	0.197	-1.092
	(0.099)	(0.069)	(0.087)	(0.146)	(0.078)	(0.110)	(0.591)	(0.241)	(0.779)
Constant	0.008	0.003	0.000	0.020**	0.022	0.016	0.027	0.016	0.065**
	(0.007)	(0.003)	(0.004)	(0.009)	(0.014)	(0.015)	(0.016)	(0.015)	(0.024)
Observations	48	48	48	48	48	48	48	48	48
R-squared	0.295	0.334	0.255	0.207	0.393	0.462	0.164	0.392	0.272

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 10 Logistics Stock Short-term Adjust Model of the Nine cities in China

	Shanghai	Beijing	Shenzhen	Guangzhou	Guangzhou	Chengdu	Hangzhou	Tianjin	Ningbo
dgdp	0.064	0.440**	-0.032	-0.078	-0.958***	-0.242	-0.138	-0.091	0.117
	(0.118)	(0.167)	(0.139)	(0.280)	(0.347)	(0.151)	(0.524)	(0.182)	(0.630)
vacancy_3	-0.027	-0.114	0.018	0.177	0.031	0.010	0.026	0.034	-0.152
	(0.088)	(0.205)	(0.281)	(0.341)	(0.358)	(0.094)	(0.378)	(0.161)	(0.382)
ecm_3	-0.172	0.115	-0.041	0.182	-0.038	-0.113	1.222	0.606	-0.081
	(0.188)	(0.299)	(0.463)	(0.513)	(0.445)	(0.194)	(2.558)	(0.710)	(2.507)
Constant	0.002	-0.008	-0.001	-0.013	0.018	0.007	-0.001	-0.006	0.023
	(0.014)	(0.016)	(0.026)	(0.032)	(0.074)	(0.024)	(0.071)	(0.044)	(0.082)
Observations	46	46	46	46	46	46	46	46	46
R-squared	0.027	0.148	0.001	0.011	0.155	0.063	0.007	0.024	0.005

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1*** p<0