Inventory Digestion Cycle, Product Market Competition and Corporate Value: Evidence Form Panel Data of Listed Real Companies in China

ZHU Jiajun[a],*; ZHU Tian[b]; WANG Min[b]

[a]Associate Professor, School of Business, Jiangnan University, Wuxi, China.
[b]Postgraduate Student, School of Business, Jiangnan University, Wuxi, China.
*Corresponding author.

Abstract

This paper using China real estate listed companies from 2008 to 2015 as samples to analyze the relation among inventory digestion cycle, debt financing and product market competition and how these factors affect corporate value. The conclusions are as follows: (a) the inventory digestion cycle is significantly positively related to debt financing, and inventory digestion cycle takes on a inverted U-shaped relationship with product market competition based on debt financing; (b) high level or growth rate of inventory digestion cycle has an obvious inhibitory action on product market competition; (c) the higher the inventory digestion cycle, the smaller the corporate value, and the product market competition plays a partial intermediary effect between the inventory digestion cycle and the corporate value. The paper investigate the mechanism of inventory digestion cycle on the corporate value of static and dynamic perspectives, thus providing suggestive guidance for real estate companies to optimize resource allocation and improve management performance.

Key words: Inventory digestion cycle; Debt financing; Product market competition; Listed real companies

INTRODUCTION

Adam Smith believed that competition is the mechanism for improving business efficiency, achieving the resource optimal allocation. As the core essential factor of market competition, product market competition not only embodies the market rules of the survival of the fittest, but also reflects the important indicator of the core competitiveness (Vickers, 1995). From the perspective of external development, product market competition not only reflects the connecting strength between enterprise products (services) and the market demand, but also is an important factor to measure company's product market position and enterprise sustainable development ability (Song et al., 2009). From the perspective of internal governance, product market competition is an important evaluation index of management performance, which can effectively constraint the management behaviors and increase the crisis sense of management in order to reduce the cost of capital (Liao & Lin, 2016), speed up the product technology innovation and obtain a bigger market share and scale benefits (Gu, 2016).

The real estate industry has higher capital concentration, larger opening degree and wider industrial chain coverage than other industries in China. By late 2014, the IMF and other international institutions warned that a real estate oversupply problem had arisen that threatened to negatively impact the economy, particularly in 2nd and 3rd tier cities. According to IMF report, one of the biggest challenges to a recovery in China's residential property market remains huge swaths of unsold homes, in Tier 1 cities of Beijing, Shanghai, Guangzhou and Shenzhen had created an inventory equal to less than 12 months' worth of sales. In Tier 2 cities, unsold inventories rose to nearly 1.5 years' worth of sales. China's least-developed cities, those in Tier 3 and Tier 4, had an alarmingly high stock of unsold homes equal to nearly three years' worth of sales. Russell Platt, the chief executive of Forum Partners said that China's residential

property market is a major indicator of the country's economic health, but the issue that really began to scare us is the extent of the inventory overhang. At the same time, James Chanos, the founder and president of Kynikos Associates said that when the housing demand isn't there, the overdependence on new real estate will cause the nation to eventually "hit a wall". With the overbuilding of real estate, the scale of debt financing has taken a quantum leap since 2010. According to the 2014 Moody's report, net debt levels for Chinese developers rose 29% from 2013, nearly twice as fast as their revenue growth. Debt pressure makes estate companies curtail borrowing for new projects and land purchases.

Product market competition is directly related to business operation and management benefits of estate companies. On the one hand, high-growth and high-income lead to high debt and high leverage, "limited liability effect" of debt brings the enterprise scale economies, enhance the corporate value; on the other hand, high competition and high expectations produce high inventory and high risk, "plunder effect" of debt increases the bankruptcy risk of corporate. In particular, the companies which have the single product type, fast scale expansion, high internal transaction costs, higher inventory digestion cycle will face the danger of being eliminated. Therefore, the inventory has become an important problem in capital structure adjustment of real estate companies. According to the market competition theory, this paper analyzes the characteristic of inventory digestion cycle and debt financing of real estate listed companies in China and their relationship with product market competition, and researches the functional mechanism of leverage effect and scale effect from the perspective of internal governance and external constraints in order to provide useful reference for real estate enterprises to optimize the allocation of resources, enhance the competitive advantage and increase the company's performance.

1. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

1.1 Financial Leverage and Product Market Competition

Debt financing is an important basis for affecting enterprise competitiveness, on the one hand, the increase in the cost of competition will reduce business net cash flow and influence the accumulation of internal funds in the fierce market competition (Yang & Wang, 2016). On the other hand, stakeholders will emasculate and restrict corporate finance capacity based on risk consideration (Maksimovic & Titman, 1991). Especially when there is no difference in products, services and management efficiency compared with competitors, the low financial leverage becomes a competitive advantage, business

will choose a conservative financial policy based on the future operating expectations and market competition situation (Opler & Titman, 1994). There are different research conclusions between financial leverage and product market competition: (a) There is a positive correlation between financial leverage and product market competition. According to the "limited liability" affect of debt financing, the better the operating environment, the higher the marginal profit of the enterprise (Brander & Lewis, 1986). Therefore, the shareholders will raise the scale effect through the debt financing in order to obtain more surplus value. This aggressive behavior increases the competitive advantage of the firm in the product market (Lyandres, 2006). (b) There is a negative correlation between financial leverage and product market competition. Kanatas and Qi (2001) believe that in fierce market competition, high financial leverage enterprises will not only be affected by product demand and price, but also be restricted by the creditor's principal-agent relationship, thereby these companies has steadily been losing market share to other firms which have low financial leverage. Especially in the change of macroeconomic environment, business cycle and industrial policy, the "predator effect" will be more significant, so the higher the financial leverage, the greater the finance and bankruptcy risk of firms. (c) There is a non linear relationship between financial leverage and product market competition. Based on complex market conditions, agency issues, asset exclusivity, bankruptcy risk, etc., debt financing of the listed real estate company takes on an inverted U-shaped relationship with product market competition, that is, with the increase of debt financing, the sensitivity of product market competition increase first and then decrease (Pandey & Chotigeat, 2004). Therefore, debt financing is closely related to product market competition, based on the subjective and objective factors, the debt financing of real estate enterprise will not only affect the corporate performance, but also influence the investment decision. Based on the above analysis, hypothesis 1 is presented.

H1: There is a negative correlation between the debt financing and product market competition.

1.2 Inventory Management and Product Market Competition

The principal goal of inventory managing is always to strike a balance amongst the contending specifications for attaining ideal inventory ranges. Chikan (1996) argues that inventory is an important indicator for measuring the level of asset management and operational capacity of enterprises, but inventory strategy is a dynamic process that is influenced by the interaction between internal and external variables. Vastag and Whybark (2005) consider that inventory turnover has a knockout affect, it will indirectly affect the enterprise labor productivity and organizational performance based on indicators such as

return on investment, sales revenue and marginal cash flow. The relationship between inventory and product market competition includes: Firstly, there is a non-linear relationship between inventory and product market competition. Jawahar and Mclaughlin (2001) find that enterprises will suit market competition and adjust the inventory strategy based on its life cycle. The results show that enterprise product inventory strategy is a non-linear process. Secondly, there is a positive relationship between inventory and product market competition. Cannon (2008) argues that the inventory strategy is the external performance of the firm's capital intensity. Capital-intensive business is often associated with higher inventory turnover, the value flow promotes the rapid development of the organization. Therefore, based on a given debt level, combinatorial optimization problems of inventory resources enhance the market competitiveness of enterprises. Lee et al. (2015) argue that although inventory management is constrained by liquidity and control, but the better the company innovation, the higher the efficiency of inventory management, and the stronger the product's market competitiveness. Thirdly, there is a negative relationship between inventory and product market competition. As the market demand growth, companies may pursue short-term growth at the expense of "excess inventory" (Basu & Wang, 2011), but in the context of equity and debt financing, high inventories will affect corporate liquidity, increase financing risks and directly or indirectly affect business performance. Destocking has the narrow and broad definition: The narrow sense considers that destocking only refers to reduce the inventory level; the broad sense considers that destocking includes not only the reduction of the excessive investment and financing costs, but also the reform of stock control and product structure (Luciano & Peccati, 1999). Therefore, the competitive strategies of the real estate industry should not only consider the relationship between debt structure and risk tolerance, but also weigh up the relationship between the inventory strategies and the competitive behaviors of competitors. Based on the above analysis, hypothesis 2 and hypothesis 3 are presented.

H2: The inventory digestion cycle is significantly negatively related to product market competition, and inventory digestion cycle takes on an inverted U-shaped relationship with product market competition based on debt financing.

H3: When inventory digestion cycle is higher level or faster growth, inventory digestion cycle has more significant inhibitory effect on product market competition.

1.3 Inventory Management, Product Market Competition and Corporate Value

Competition is not only a kind of management measure of "hidden incentive", but also an effective external corporate governance mechanism, it can improve the efficiency of enterprise resource allocation and promote the survival of the fittest (Alimov, 2016). On the one hand, product market competition reflects the tightness of enterprise products and market demands, and promotes managers to increase productivity and reduce corporate bankruptcy risk (Nickell, 1996). On the other hand, based on the impact of internal and external factors, product market competition will aggravate agency conflicts, reduce resource utilization efficiency and profit margins, as a result, product market competition has a negative impact on ROA or ROE (Giroud & Muller, 2010). Market competition is one of the important factors in determining the corporate strategies. When the industry has a high market concentration, the company's product market competition is positively related to the enterprise performance. However, if companies blindly pursue the market share, their operational risk will increase and enterprise value will decline. The optimal relationship between competition and inventory will directly and indirectly affect the firm value. From the positive point of view, a larger inventory is a strategic advantage for companies, which can not only improve the bargaining power of external financing (Tribo, 2007), but also correct the market price deviation by putting the product into the market (Blazenko, 1999). From the negative effect, inventory not only reflects the efficiency of the use of corporate capital, but also reflects the effectiveness of corporate oversight and decision-making, overstock is often a sign of poor management (Elsayed & Wahba, 2013), therefore, high inventories will reduce corporate value. But due to the differences of production and operation conditions, industry, industrial policy and so on, the impact of inventory reduction on organizational performance is limited, zero inventory may not be an optimal strategy under special conditions (Deangelo & Roll, 2015). Therefore, the inventory management which is consistent with debt structure and competitive strategies enable to reduce operative costs and enhance corporate performances. Based on the above analysis, hypothesis 4 and hypothesis 5 are presented.

H4: The product market competition is significantly positively related to the corporate value, but the inventory digestion cycle inversely related to the corporate value.

H5: The product market competition plays a partial intermediary effect between the inventory digestion cycle and the corporate value.

2. DATA, DEFINITIONS AND DESCRIPTIVE STATISTICS

2.1 Data and Sample Selection

Our study sample is composed of Chinese real estate listed firms during 2008-2015 from both the Shanghai

and Shenzhen Stock Exchanges. Financial statement data comes from the China Stock Market and Accounting Research database (CSMAR) and China national statistical yearbook. Data screening is according to the following standards: Firstly, excluding company samples which consecutive losses of two or more years; secondly, excluding company samples which data serious distortion and missing; thirdly, excluding company samples which inventory digestion cycle less than or equal to zero; fourthly, excluding company samples which under construction and new real estate value (area) are zero for 2 consecutive years. There is over 816 data of 102 listed companies in our sample period.

2.2 Variable Definitions

2.2.1 Product Market Competition

Herfindahl-Hirschman Index (HHI) is the main international method for measuring the product market competition. The HHI variable, which is defined as the sum of the squared market shares of all firms in each industry. A firm's market share ($PMC_{i,t}$) is determined by the ratio of the firm's sales to the sum of sales of all firms in the industry. According to the structure principle of the HHI, A firm's market share ($PMC_{i,t}$) generally includes absolute and relative market share. Absolute market share ($APMC_{i,t}$) is the percentage of the firm i real estate sales (volume) that are held in the total industry sales (volume) in year t. Relative market share ($RPMC_{i,t}$) is the percentage of the firm i real estate sales (volume) to the largest sales (volume) firm among the total industry or the sample in year t. In order to reflect the change of competition position of the small-scale company, based on the Rosenbluth distance method, this paper introduce the market share of each firm in year t as the weight ($W_{i,t}$) to determine the rank-based market share ($SPMC_{i,t}$). $SPMC_{i,t}$ is determined by the ratio of the weighted $sales_{i,t}$ to the sum of $sales_{i,t}$ of n firms in real estate industry during year t. Here, $sales_{i,t}$ denote the total sales of firm i in real estate industry during year t, n is the number of firms in real estate industry, and $W_{i,t}$ is the rank of sales of firm i in real estate industry during year t.

2.2.2 Debt Financing

The asset-liability ratio is the main measure of a firm's capital structure or debt level, because the market perceives highly leveraged firms as risky, thus negatively affecting firm value. Following the literature, there are two alternative measures for leverage. First, book leverage is calculated as the book value of total debt divided by the book value of total assets. Second, market leverage is computed as the book value of total debt divided by the sum of the book value of debt and the market value of equity (Berger et al., 1997). These two measures are continuous variables that take values between 0 and 1.

2.2.3 Inventory Digestion Cycle

In the general companies, inventory is the raw materials, work-in-process products and finished goods that are considered to be the part of a business's assets that are ready or will be ready for sale. However, the stocks in the inventory digestion cycle are residential building, business building and ancillary facilities of unsold, under or awaiting construction. The inventory digestion cycle is the logarithm of the ratio of unsold homes (area) of company i in year t divided by the average monthly turnover volume (area) over the past 12 months. In order to reflect the difference between the corporate inventory digestion cycle and the average inventory digestion cycle of the industry, the dummy variable of inventory level ($ICDV_{i,t}$) is established. 1 if $IC_{i,t}$ of the company i in year t is greater than the national average inventory digestion cycle, and 0 otherwise. At the same time, the dummy variable of inventory growth ($ICGDV_{i,t}$) is established to reflect the changes in the current inventory. 1 if inventory growth of the company i in year t is higher than year t-1, and 0 otherwise.

2.2.4 Corporate Value

Corporate value is generally measured by ROA, ROE, Tobin Q and the ratio of EBIT to total assets. ROE is the core of DuPont Analysis, it is the percentage of net profit to average shareholder's equity. Compared with the ROA, ROE is used to measure the corporate value based on the company's actual profitability, it can truly reflect the investment return of corporate shareholders, in general, the higher the ROE, the greater the corporate value.

2.2.5 Control Variables

Based on relevant literatures, this study employed eight control variables. Firstly, a firm's size ($Size_{i,t}$), measured by the log of total assets, is used as a control variable because large firms tend to enjoy economies of scale and thus may demonstrate better performance. Secondly, company listed age ($Age_{i,t}$), measured by the log of listed years of the company i, is used as a control variable because the longer listed firms were capable of obtaining a bigger range of finance. Thirdly, with reference to the firm's characteristics, we also include completion of sales ($CSDV_{i,t}$), capital appreciation rate($Growth_{i,t}$), annual investment ratio ($IR_{i,t}$), equity concentration ($HT3_{i,t}$) and dividend ($Div_{i,t}$). Finally, we controlled for CEO duality effects. CEO duality ($CEOD_{i,t}$) has been found to be an important antecedent of CEOs attitudes and behaviors, especially in regard to their risk-taking propensity. Among them, t-1 represents a lagged period, $\varepsilon_{i,t}$ represents random perturbation term that changes with the individual and time. Table 1 reports the definitions of all variables used in the analysis.

Table 1
Summary of Explanation of Variables

Variables	Abbreviation	Definition
Corporate value	$ROE_{i,t}$	The percentage of net profit to average shareholder's equity.
Product market competition	$SPMC_{i,t}$	The rank-based market share.
Inventory digestion cycle	$IC_{i,t}$	Log of the ratio of unsold homes (area) of company i in year t divided by the average monthly turnover volume (area) over the past 12 months.
Dummy variable of inventory level	$ICDV_{i,t}$	1 if $IC_{i,t}$ of the company i in year t is greater than the national average inventory digestion cycle, and 0 otherwise.
Dummy variable of inventory growth	$ICGDV_{i,t}$	1 if inventory growth of the company i in year t is higher than year t-1, and 0 otherwise.
Debt financing	$Lev_{i,t}$	The book value of total debt divided by the book value of total assets of the company i in year t.
Company size	$Size_{i,t}$	Log of the total asset of the company i in year t.
Company listed age	$Age_{i,t}$	Log of listed years of the company i.
Dummy variable of completion of sales	$CSDV_{i,t}$	Completion of Sales (CS) is the difference between the actual sales and the planned sales of the company i in the year t divided by the planned sales,1 if $CS \geq 1$, and 0 otherwise.
Equity concentration	$HT3_{i,t}$	The square sum of the proportion of first three shareholders holding.
Dividend	$Div_{i,t}$	Dividend is a dummy variable, 1 if the company i has paid cash dividends in the year t, and 0 otherwise
Capital appreciation rate	$Growth_{i,t}$	The net capital increase of the company i in year t divided by the total capital at the end of year t-1.
Annual investment ratio	$IR_{i,t}$	The total investment of the company i in year t divided by total assets at the end of the year.
CEO duality	$CEOD_{i,t}$	CEO duality is a dummy variable, 1 if the CEO also the chairperson of the board meeting and 0 or otherwise.

2.3 Models

2.3.1 Inventory Management, Financial Leverage and Product Market Competition

In order to reflect the impact of inventory digestion cycle and debt financing on product market competition, this paper introduces the inventory digestion cycle into the product market competition model (Qi et al., 2008) and obtains the following model:

$$SPMC_{i,t}=a+b_1 Lev_{i,t}+\beta Controls+\varepsilon_{i,t} \tag{1}$$

$$SPMC_{i,t}=a+b_1 IC_{i,t}+\beta Controls+\varepsilon_{i,t} \tag{2}$$

$$SPMC_{i,t}=a+b_1 IC_{i,t}+b_2 Lev_{i,t}+b_3 IC_{i,t}*Lev_{i,t}+\beta Controls+\varepsilon_{i,t} \tag{3}$$

$$SPMC_{i,t}=a+b_1 IC_{i,t}+b_2 Lev_{i,t}+b_3 IC_{i,t}*Lev_{i,t}+b_4 (IC_{i,t})^2*Lev_{i,t}+\beta Controls+\varepsilon_{i,t} \tag{4}$$

$$SPMC_{i,t}=a+b_1 IC_{i,t}+b_2 Lev_{i,t}+b_3 IC_{i,t}*Lev_{i,t}+b_4 IC_{i,t}*Lev_{i,t}*ICDV_{i,t}+\beta Controls + \varepsilon_{i,t} \tag{5}$$

$$SPMC_{i,t}=a+b_1 IC_{i,t}+b_2 Lev_{i,t}+b_3 IC_{i,t}*Lev_{i,t}+b_4 IC_{i,t}*Lev_{i,t}*ICGDV_{i,t}+\beta Controls + \varepsilon_{i,t} \tag{6}$$

The regression (1) is used to validate H1. It used to explain the relationship between debt financing and product market competition. The regression (2), (3) and (4) are used to validate H2. By introducing the interaction between inventory digestion cycle and the debt financing, which are used to measure the common impact of debt financing and inventory digestion cycle on product market competition. Through the introduction of the second term of inventory digestion cycle to determine whether the existence of U-shaped curve relationship. The regression (5) and (6) are used to validate H3. By introducing the dummy variable $ICDV_{i,t}$ and $ICGDV_{i,t}$, which are used to observe the static and dynamic effects of the inventory digestion cycle on product market competition.

2.3.2 Inventory Management, Product Market Competition and Corporate Value

In order to reflect the impact of inventory digestion cycle and product market competition on corporate value, this paper introduces the inventory digestion cycle into the product market competition and enterprise performance model (Song et al., 2009) and obtains the following model:

$$ROE_{i,t}=\alpha+b_1 IC_{i,t}+\beta Controls+\varphi Year+\varepsilon_{i,t} \tag{7}$$

$$ROE_{i,t}=\alpha+b_1 SPMC_{i,t}+\beta Controls+\varphi Year+\varepsilon_{i,t} \tag{8}$$

$$ROE_{i,t}=\alpha+b_1 IC_{i,t}+b_2 SPMC_{i,t}+\beta Controls+\varphi Year+\varepsilon_{i,t} \tag{9}$$

The Model (7) and (8) are used to verify H4, and analyze the impact of inventory digestion cycle and product market competition on corporate value, respectively. The Model (2), (7) and (9) are used to verify H5, and analyze whether the product market competition has an intermediary effect on the inventory digestion cycle and the corporate value.

3. RESEARCH RESULTS AND ANALYSIS

3.1 Descriptive Statistics

Table 1 gives a descriptive statistic of the main variables. The mean value of $SPMC_{i,t}$ is 1.2136(%), indicating that the average market share of real estate company is

lower. The range of $IC_{i,t}$ is bigger, indicating that there are great differences of inventory digestion cycle between different companies, at the same time, the mean value of $ICDV_{i,t}$ is 64.71% and the mean value of $ICGDV_{i,t}$ is 56.13%, indicating that high level and high growth rates

of inventory are common. The mean value of $Lev_{i,t}$ is 62.86%, indicating that the real estate industry is a sector of high liability. The mean value of $CSDV_{i,t}$ is 75.74% and $IR_{i,t}$ is 56.60%, indicating that the current real estate industry sales and investment are in very good condition.

Table 2
Descriptive Statistics

Variables	Mean	Median	Maximum	Minimum	Std.dev	Observations
$ROE_{i,t}$	0.0965	0.0923	2.8542	-1.5596	0.1734	816
$SPMC_{i,t}$	1.2136	1.2960	2.9957	0.0000	0.5851	816
$IC_{i,t}$	1.6901	1.7704	9.0691	-4.7521	1.2816	816
$ICDV_{i,t}$	0.6471	1.0000	1.0000	0.0000	0.4782	816
$ICGDV_{i,t}$	0.5613	1.0000	1.0000	0.0000	0.4965	816
$Lev_{i,t}$	0.6286	0.6567	1.7908	0.0145	0.1851	816
$Size_{i,t}$	23.1267	23.0238	27.3366	19.8555	1.1864	816
$Age_{i,t}$	2.6783	2.7726	3.2581	0.0000	0.4251	816
$CSDV_{i,t}$	0.7574	1.0000	1.0000	0.0000	0.4289	816
$HT3_{i,t}$	0.4803	0.4878	0.8336	0.1078	0.1638	816
$Div_{i,t}$	0.6275	1.0000	1.0000	0.0000	0.4838	816
$Growth_{i,t}$	0.4058	0.1003	37.2985	-13.232	2.1000	816
$IR_{i,t}$	0.5660	0.4902	38.3722	0.0000	1.4555	816
$CEOD_{i,t}$	0.8664	1.0000	1.0000	0.0000	0.3404	816

3.2 Correlation Analysis

According to the Pearson correlation analysis, the correlation coefficient between $IC_{i,t}$ and $SPMC_{i,t}$ is -0.2306 ($P<0.05$), indicating that $IC_{i,t}$ inversely related to $SPMC_{i,t}$, and the correlation coefficient between $Lev_{i,t}$ and $SPMC_{i,t}$ is -0.3332 ($P<0.05$), indicating that $Lev_{i,t}$ inversely related to $SPMC_{i,t}$. H1 has been concluded preliminary tests. The correlation coefficient between $IC_{i,t}$ and $ROE_{i,t}$ is -0.1165 ($P<0.05$), indicating that $IC_{i,t}$ is significantly negatively related to $ROE_{i,t}$ and the correlation coefficient between $SPMC_{i,t}$ and $ROE_{i,t}$ is 0.2301 ($P<0.05$), indicating that $SPMC_{i,t}$ and $ROE_{i,t}$ appear in a obvious positive correlation. H4 has been concluded preliminary tests.

3.3 Hypothesis Tests

3.3.1 Inventory Management, Financial Leverage and Product Market Competition

In regression (1), the coefficient of $Lev_{i,t}$ is negative, indicating that the debt financing is more restrictive to the real estate enterprises. The high debt financing not only increases the financial risk of the company, but also exacerbates the bankruptcy risk based on market "looting effect". Therefore, the high debt financing plays a role of negative effects on product market competition. This result is consistent with Qi et al. (2008), Kanatas and Qi (2001) findings, so H1 was verified. In regression (2), the $IC_{i,t}$ and the $SPMC_{i,t}$ were negatively correlated, that is, inventory digestion cycle has an obvious inhibitory

action on product market competition, indicating that the inventory costs shall be raised steeply based on inventory increase, so the product competitiveness will be decreased. The coefficient of the interaction between inventory digestion cycle and the debt financing is positive, that is, there is a significant substitution relation between the inventory digestion cycle and debt financing. In addition, the coefficient of $(IC_{i,t})^2*Lev_{i,t}$ is negative, indicating that the inventory digestion cycle takes on a inverted U-shaped relationship with the debt financing and product market competition. In the context of high investment and high income in the real estate market, the leverage effect of debt financing has increased the scale benefit. However, the high inventory will reduce the financial elasticity, increase the financing risk and inhibit the real estate company's market expansion and development, therefore, with the increase of the inventory digestion cycle, the sensitivity of the product market competition increase first and then decrease. H2 was verified. In regression (5) and regression (6), the coefficient of $IC_{i,t}*Lev_{i,t}$ is positive, the coefficients of $IC_{i,t}*Lev_{i,t}*ICDV_{i,t}$ and $IC_{i,t}*Lev_{i,t}*ICGDV_{i,t}$ are negative, indicating that if the inventory digestion cycle is higher level or faster growth, the competitiveness of real estate companies will be significantly weakened. H3 has been confirmed.

3.3.2 Inventory Management, Product Market Competition and Corporation Value

In regression (7), there is a negative correlation between the inventory digestion cycle and corporation value,

indicating that high inventory will increase operating costs and reduce business performance. In regression (8), there is a positive correlation between the product market competition and corporation value, indicating that product market competition is an effective external oversight method, which has played a stimulating role for management, thereby improving the efficiency of resource allocation and enhancing the company's performance. This result is consistent with Nickell (1996) findings,

so H4 was verified. According to regression (2), (7) and (9), the product market competition plays a partial intermediary effect between the inventory digestion cycle and the corporate value, so H5 was verified. This result show that the inventory digestion cycle direct and indirect impact on corporation value, therefore, inventory management and control is one of the most important works to enhance product market competitiveness and business performance.

Table 3
Regression Analysis

Variables	(1) $SPMC_{i,t}$	(2) $SPMC_{i,t}$	(3) $SPMC_{i,t}$	(4) $SPMC_{i,t}$	(5) $SPMC_{i,t}$	(6) $SPMC_{i,t}$	(7) $ROE_{i,t}$	(8) $ROE_{i,t}$	(9) $ROE_{i,t}$
$Lev_{i,t}$	-0.297** (0.144)		-0.524*** (0.173)	-0.490*** (0.171)	-0.554*** (0.173)	-0.552*** (0.172)			
$IC_{i,t}$		-0.075*** (0.013)	-0.155*** (0.038)	-0.154*** (0.037)	-0.117*** (0.042)	-0.126*** (0.039)	-0.013*** (0.004)		-0.010*** (0.004)
$IC_{i,t}*Lev_{i,t}$			0.143** (0.064)	0.222*** (0.066)	0.147** (0.064)	0.156** (0.063)			
$(IC_{i,t})^2*Lev_{i,t}$				-0.024*** (0.006)					
$IC_{i,t}*Lev_{i,t}*ICDV_{i,t}$					-0.046** (0.022)				
$IC_{i,t}*Lev_{i,t}*ICGDV_{i,t}$						-0.044*** (0.014)			
$SPMC_{i,t}$								0.036** (0.010)	0.031*** (0.011)
$Size_{i,t}$	0.318*** (0.045)	0.259*** (0.042)	0.302*** (0.044)	0.289*** (0.044)	0.304*** (0.044)	0.304*** (0.044)	0.041*** (0.012)	0.019*** (0.006)	0.018*** (0.006)
$Age_{i,t}$	0.273 (0.182)	0.344* (0.178)	0.297* (0.178)	0.266 (0.176)	0.294* (0.178)	0.286 (0.177)	0.037 (0.052)	0.009 (0.018)	0.009 (0.017)
$CSDV_{i,t-1}$	0.312*** (0.088)	0.278*** (0.086)	0.281*** (0.086)	0.275*** (0.085)	0.279*** (0.085)	0.328*** (0.086)	0.025 (0.025)	0.009 (0.024)	0.004 (0.024)
$HT3_{i,t}$	0.738*** (0.273)	0.803*** (0.266)	0.794*** (0.265)	0.754*** (0.262)	0.841*** (0.265)	0.757*** (0.263)	0.480*** (0.077)	0.189*** (0.037)	0.193*** (0.037)
$Div_{i,t}$	0.056* (0.029)	0.054* (0.029)	0.050* (0.028)	0.052* (0.028)	0.050* (0.028)	0.053* (0.028)	0.005 (0.008)	0.004 (0.008)	0.004 (0.008)
$Growth_{i,t}$	-0.015*** (0.004)	-0.012*** (0.004)	-0.013*** (0.004)	-0.010*** (0.004)	-0.014*** (0.004)	-0.012*** (0.004)	0.003*** (0.001)	0.004*** (0.001)	0.004*** (0.001)
$IR_{i,t}$	0.003 (0.010)	0.007 (0.010)	0.007 (0.010)	0.008 (0.009)	0.007 (0.010)	0.006 (0.010)	0.001 (0.003)	0.001 (0.003)	0.001 (0.003)
$CEOD_{i,t}$	0.023 (0.059)	0.034 (0.057)	0.040 (0.057)	0.054 (0.057)	0.051 (0.057)	0.052 (0.057)	0.024 (0.017)	0.007 (0.014)	0.006 (0.014)
Cons	-7.709*** (1.127)	-6.551*** (1.090)	-7.138*** (1.104)	-6.758*** (1.093)	-7.184*** (1.101)	-7.190*** (1.095)	-1.287*** (0.315)	-0.583*** (0.165)	-0.533*** (0.164)
Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Adj R^2	0.2144	0.2506	0.2623	0.2834	0.2679	0.2750	0.1925	0.1949	0.2053
Obs	816	816	816	816	816	816	816	816	816

Note. N=816 for all models. Unstandardized coefficients are reported; the figures in parentheses are standard errors.
*p<.10; **p<.05; ***p<.01.

3.4 Robustness Tests

In this paper, the reliabilities of the research conclusions are tested by the following methods: Firstly, we replace the rank-based market share ($SPMC_{i,t}$) with monopolize rent (Nickell, 1996) and replace book leverage with market leverage, plug into regression (1) - (6), the empirical

analyses and test results support the hypothesis. Secondly, the non-parametric percentile Bootstrap method is used to test the intermediate effect of product market competition on the inventory digestion cycle and corporation value. The result satisfies a partial intermediary effect. Thirdly, in order to scientifically reflect the effect of the inventory

digestion cycle on market competition and corporate performance, we must take account of the economic cycle and national real estate policies influence. The data are divided into 2008-2011 and 2012-2015 two periods, there is no substantive change in the test results. In addition, due to the relationship between the inventory digestion cycle and product market competition or corporation value may has a certain endogenous, on the one hand, this article uses the method of ordered weighted to measure the product market competition, and uses the logarithmic method to measure the inventory digestion cycle, on the other hand, the article uses the robust variance matrix estimation method for further regression analysis, the test results can support the hypothesis. Therefore, the conclusions of this paper are robust.

CONCLUSION

This paper using China real estate listed companies in Shanghai and Shenzhen capital markets from 2008 to 2015 as samples to analyze the relation of the inventory digestion cycle, debt financing and product market competition, and the direct and indirect effects of the inventory digestion cycle on corporate value. This paper expounds the relationship between leverage effect and inventory cost, scale effect and competitive strategy, which can help real estate companies to realize the optimal resources allocation and enhance the competitive advantage and corporate value. The results show that the inventory digestion cycle of real estate companies not only directly reduces the corporate value, but also indirectly affects the corporate value through the product market competition, and the higher the inventory level or growth, the greater the inhibitory effect on the corporate value.

The contradiction between high leverage and high inventory has become an important factor affecting the operating performance and competitive strategy of real estate companies. The high inventory not only reduces the production efficiency and economic benefits of real estate companies, but also improves the competition cost and bankruptcy risk. From the external financing constraints, the stakeholders of real estate companies will not only focus on corporate performance and sales growth, but also concerned about the company's inventory costs and asset quality. When the market demand and industry policies change rapidly, the companies which rely on financial leverage to enhance product market competition will face stronger effect of double-edged sword. Thus, the inventory digestion cycle is the new benchmark of financial risk of real estate companies, so the stakeholders will take a conservative credit and loan strategy. From the internal corporate governance, the company's management not only pursues leverage effectiveness and competitive advantage, but

also worried about the backlog of inventory to further enlarge the plunder effect in the market competition. The balance of debt financing and inventory strategy is the first choice for enterprise development, and real estate companies which rely on external financing will pay more attention to keep earnings more stable and sustainable.

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