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**Article**

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# Product market competition, ultimate controlling structure and related party transactions

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## ABSTRACT

Previous studies have shown that product market competition has an important effect on corporate strategies and internal governance mechanisms. Using a sample of China's listed firms from 2004 to 2009, we explore the relationship between product market competition and normal related party transactions and find a significant positive relationship. In addition, we investigate the substitutive effect of product market competition and the cash flow rights owned by ultimate controlling shareholders on the extent of normal related party transactions. In particular, our results suggest a positive relationship between the ultimate controlling shareholders' cash flow rights and normal related party transactions that is strongest in noncompetitive industries and weakens as product market competition increases.

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## 1. Introduction

Product market competition plays a pivotal role in influencing corporate strategies and internal governance mechanisms. Shleifer and Vishny (1997) argue that “product market competition is probably the most

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powerful force towards economic efficiency in the world.” Competition increases the probability that firms with high costs will go bankrupt (Schmidt, 1997) and fear of bankruptcy is a strong incentive for managers to exert the effort required to remain competitive (Hart, 1983). Further analysis shows that product market competition is a substitute for internal governance that reduces agency costs (Karuna, 2010; Giroud and Mueller, 2011).

The role of related party transactions (*RPTs*) within business groups is widely discussed in the literature. Efficiency-enhancing theory suggests that imperfect emerging markets increase transaction costs that can be largely reduced through *RPTs* between the members of a business group (Khanna and Palepu, 1997, 2000). In contrast, agency theory argues that *RPTs* can be used in the expropriation of listed companies. In particular, business groups could use abnormal *RPTs* to tunnel resources from listed firms (Liu et al., 2008; Chang and Hong, 2000).

Following these studies, particularly the methodology of Jian and Wong (2010), we classify *RPTs* as normal or abnormal. Normal *RPTs* can decrease the transaction costs of listed firms, whereas abnormal *RPTs* can be used as a way of tunneling or propping business groups’ specific purposes. According to the efficiency-enhancing view, normal *RPTs* help firms to reduce transaction costs and increase value. This implies that product market competition leads to a greater need for normal *RPTs* to reduce transaction costs. Given that controlling shareholders with substantially more cash flow rights have strong incentives to maximize firm profits through normal *RPTs* (Shleifer and Vishny, 1986), we expect to observe a substitution effect between product market competition and controlling shareholders’ cash flow rights.

Our empirical evidence is consistent with these predictions. Using a sample of China’s A-share listed firms from 2004 to 2009, we show that product market competition has a significant positive effect on normal *RPTs*. That is, firms from more competitive industries tend to reduce transaction costs by increasing normal *RPTs*. We also find that product market competition and ultimate controlling shareholder’s cash flow rights have a substitutive effect on normal *RPTs*. Specifically, we note a positive relationship between ultimate controlling shareholders’ cash flow rights and normal *RPTs*. Moreover, this relationship is strongest in noncompetitive industries and weakens as product market competition increases.

Our study contributes to the literature in the following ways. First, it adds to the rapidly expanding work on the effects of product market competition. For example, Aghion et al. (2006) investigate the relationship between product market competition and vertical integration. Our results suggest that product market competition also affects firms’ transactions, i.e. firms from more competitive industries are more likely to have normal *RPTs* that reduce transaction costs. Second, our study has an important implication for research on ultimate controlling shareholders. Previous studies have mainly investigated the tunneling of ultimate controlling shareholders based on agency theory, ignoring the alignment of interests between controlling shareholders and other investors. Our results provide evidence that the cash flow rights of ultimate controlling shareholders have a positive effect on firms. Finally, we shed light on the relationship between external and internal corporate governance. Previous studies have shown that product market competition can either complement or substitute for some internal corporate governance mechanisms (Karuna, 2010; Giroud and Mueller, 2011). Our findings support the substitution effect by showing that the influence of ownership structure on the occurrence of normal *RPTs* is weakened by product market competitiveness.

The remainder of this paper is organized as follows. Section 2 develops the hypotheses and discusses the related empirical predictions. Section 3 discusses methodological and empirical issues. Section 4 presents our empirical results and Section 5 concludes the paper.

## 2. Literature review and hypothesis development

### 2.1. Product market competition and *RPTs*

Previous studies have shown that product market competition is pivotal in influencing firm profitability and corporate strategy. While earlier literature speculates that insufficient competition leads to managerial slack, Hart (1983) formalizes the idea that product market competition reduces managerial slack. In contrast, Raith (2003) argues that competition induces firm exit, which creates higher cost reduction incentives for the remaining firms. Following this, numerous studies have examined the economic consequences of competition

in product markets. For example, Schmidt (1997) shows that increasing competition not only increases firms' liquidation probability and managerial incentives, but also reduces their profit. Nickell (1996) finds that increased product market competition is associated with higher productivity growth in a sample of UK manufacturing firms.

Our study investigates the effect of product market competition on *RPTs*, which are common in Chinese listed companies due to the special institutional setting in China. A large number of Chinese listed firms have been restructured from existing SOEs through "carve-outs" and they retain a huge amount of transactions with members in their business groups. The role of *RPTs* and their determinants have been widely discussed in previous studies. According to the "efficiency-enhancing view," the absence of institutions makes it costly for emerging market firms to acquire necessary inputs such as finance, technology and management talent. In this context, a firm may be most profitably pursued as part of a large, diversified business group that can act as an intermediary between individual firms and imperfect markets (Khanna and Palepu, 1997, 2000). Zheng et al. (2007) suggest that the efficiency effect dominates internal markets and increases firm value.<sup>1</sup> Ma and Wang (2009) use the results of a case study conducted at Shanghai Fu-Shing Inc. to determine that *RPTs* can be an effective means of efficient resource allocation.

However, *RPTs* can also be used as a means for controlling shareholders to satisfy particular needs. The "tunneling" view argues that the operation of *RPTs* in business groups provides a convenient channel through which controlling shareholders can transfer resources at the expense of minority shareholders in listed firms (Chang and Hong, 2000; Cheung et al., 2006). Using a sample of China's listed firms, Jian and Wong (2010) reveal that abnormal *RPTs* are used by controlling shareholders to obtain private benefits. In sum, *RPTs* can be classified as normal or abnormal. Normal *RPTs* decrease the transaction costs of listed firms, whereas abnormal *RPTs* act as a way of tunneling and propping up a business group's specific needs. Therefore, following Jian and Wong's (2010) approach, we exclude abnormal *RPTs* and examine the relationship between product market competition and normal *RPTs*.

Transaction cost theory suggests that product market competition increases uncertainty, thus increasing the likelihood of vertical integration (Williamson, 1975, 1985). Aghion et al. (2006) argue that more competition increases the likelihood of vertical integration in sharing innovation benefits. Firms can benefit from an increase in normal *RPTs* in at least two ways. First, firms in competitive industries have higher bankruptcy risk than those in noncompetitive industries. This implies that firms in competitive industries can increase normal *RPTs* to reduce transaction costs, which can partially mitigate their bankruptcy risk. Second, product market competition may foster innovation and growth, allowing firms in competitive industries to share their innovation surplus with other member firms in the business group through normal *RPTs*. Therefore, we anticipate that product market competition is positively related to normal *RPTs*.

**Hypothesis 1.** Product market competition is positively related to normal *RPTs*.

## 2.2. Product market competition, ultimate controlling structure and related party transactions

Controlling shareholders can play a role in effectively monitoring the activities of firm managers, alleviating the free-rider problem associated with dispersed shareholders (Shleifer and Vishny, 1986). Some researchers have examined the relationship between the cash flow rights of the ultimate controlling shareholder and corporate valuation (La Porta et al., 2002; Lins, 2003). Bertrand et al. (2002) investigate Indian business groups and find that their owners are often accused of expropriating from minority shareholders by tunneling resources from firms in which they have low cash flow rights to firms in which they have high cash flow rights. More recently, Lin et al. (2011) explore 3468 firm-year observations in 22 countries from 1996 to 2008 and find that the cost of debt financing is significantly lower for companies with large ultimate owner's cash flow rights. Some researchers who have focused on China's capital market have also found that firms in which the controlling shareholder has higher cash flow rights or lower separation between ownership and control exhibit higher operating performance. For instance, Tong and Wang (2007) find that controlling shareholders

<sup>1</sup> Zheng et al.'s (2007) conclusion is made when the ratio of internal product transactions to total assets is below 20% or above 50%.

pursue the advantages of shared benefits through *RPTs* when their proportion of shareholdings is more than 50%.

Recent studies have suggested that product market competition and internal corporate governance mechanisms are substitutes. For example, Karuna (2010) argues that product market competition can affect the strength of some internal governance mechanisms by influencing the costs and benefits of monitoring, given that competition acts as an important disciplinary mechanism in firm leadership. Giroud and Mueller (2011) examine the interaction between product market competition and corporate governance and find that weak governance firms have lower equity returns, inferior operating performance and lower firm value, but only in noncompetitive industries. More recently, Chhaochharia et al. (2012) use the Sarbanes Oxley Act as a natural experiment to explore the ways in which it shocked internal governance, examining the link between product market competition and internal governance mechanisms. Consistent with the notion that product market competition is a substitute for internal governance, they also find that firms in noncompetitive industries experienced a larger improvement in operational efficiency after the approval of SOX than firms in competitive industries.

Given the abovementioned literature, we focus on how product market competition and the ultimate controlling structure influence normal *RPTs*. Product market competition acts as an important disciplinary mechanism, influencing the overall costs of monitoring. Firms in competitive industries have incentives to use normal *RPTs* to reduce transaction costs. This implies that the influence of controlling shareholders is smaller in firms in competitive industries. In contrast, the association between ultimate controlling shareholders' cash flow rights and normal *RPTs* offers a stronger incentive for firms in noncompetitive industries to lower transaction costs. Our second hypothesis is as follows:

**Hypothesis 2.** The influence of the ultimate controlling shareholder's cash flow rights on normal *RPTs* is stronger in firms in noncompetitive industries than in firms in competitive industries.

### 3. Research design

#### 3.1. Sample and data

The China Securities Regulatory Commission promulgated the "Regulation on the Content and Format of Information Disclosure of Firms with Public Equity Offerings No. 2" on December 13, 2004. Chinese listed companies have been required to disclose a block diagram of the title and control relationship between the company and the actual controller since 2004. To adjust for the potential measurement bias of the ultimate controlling structure, our sample period covers 2004–2009 in China's A-share market. After eliminating financial companies, securities companies and companies with unavailable data, we obtain a sample of 5954 observations. The ultimate controlling shareholder's cash flow rights variable is hand-collected and other financial variables are obtained from the China Securities Market and Accounting Research (CSMAR) database.

#### 3.2. Variables

##### 3.2.1. Product market competition variables

Following the literature, we measure product market competition using three variables: the number of market participants in an industry (*Num*), the concentration ratio (*CR4*) and the Herfindahl–Hirschman Index (*HHI*) (Curry and George, 1983; Haushalter et al., 2007; Karuna, 2007; Li, 2010). "*Num*" is defined as the total number of companies in an industry. The number of market participants in the industry has a direct bearing on issues of concentration and competition. "*CR4*" measures the proportion of industry share for the four largest firms. This measure is easy to interpret and indicates the market share (concentration) of the four largest companies composing the industry, the maximum being 100% (monopoly). "*HHI*" is defined as the sum of the squares of the percentage shares of each company in relation to the total size of the industry. A higher value of *HHI* indicates stronger product market competition.

### 3.2.2. Ultimate controlling shareholder's cash flow rights variables

The manually collected ultimate controlling structure variables include the cash flow rights proportion, voting rights held by the controlling shareholder and voting rights held by other top-10 shareholders. Following La Porta et al. (1999), the ultimate controlling shareholder's cash flow rights are computed as the product of that owner's cash-flow rights at each tier of the control chain (in some cases, more than one control chain linked an ultimate owner to a firm at the bottom of a pyramid). In addition, we consider relationships between the top 10 shareholders and their combined ownership positions. If the block diagram disclosed in the annual report does not publish information on known shareholder relationships, then we amend the block diagram and use it to calculate the ultimate controlling shareholder's cash flow rights variable (*CashR*).

Based on the above analysis, "*CashR*" is the product of the owner's cash-flow rights at each tier of the control chain. A higher *CashR* indicates better alignment of interests between ultimate controlling shareholders and other investors.

### 3.2.3. Normal related party transaction variables

*RPT* data is taken from the CSMAR related party transaction research database. There are many types of *RPTs* between listed firms and their business groups, including sales and purchases of goods and products, accounts receivable and accounts payable, the exchange of assets, loans or loan guarantees. We include related party sales and purchases as our measure of related party transactions, as sales and purchases are the most frequent type of *RPT* (e.g. Liu and Liu, 2007; Hong and Xue, 2008). Furthermore, *RPT* is separated into three categories: sales and purchases of goods and services (*RPT*), purchases of goods and services (*RPT\_Purc*), and sales of goods and services (*RPT\_Sale*). "*RPT*" is measured as the sum of related purchases and sales divided by total sales. "*RPT\_Purc*" is measured as the sum of related purchases of goods and services divided by total sales. "*RPT\_Sale*" is measured as the sum of related sales of goods and services divided by total sales.

We adopt Jian and Wong's (2010) approach to estimate normal *RPTs*. They use an OLS regression model to obtain the abnormal component of *RPTs* that are associated with industry classifications and firm characteristics such as leverage, size and growth. The residual term is the measure of abnormal related party transactions and the predicted term is normal related party transactions. This model is widely used in recent related party transaction research (e.g. Yeh et al., 2012). The following model is used:

$$RPT = \beta_0 + \beta_1 Lev + \beta_2 Size + \beta_3 MTB + Industry\ fixed\ effects + \varepsilon \quad (1)$$

We run three sets of year-by-year (2004–2009) regressions, one each for *RPT*, *RPT\_Purc* and *RPT\_Sale* as the dependent variables. The results are summarized in Appendix A. Furthermore, since our conclusions are largely dependent on the validity of the model, we examine the correlation between *RPTs* and firm performance. *RPT* is decomposed into normal and abnormal *RPTs* and the results show that normal *RPTs* are positively correlated with firm performance as measured by *ROA*, *ROE* or *ROS*. Abnormal *RPTs* are negatively correlated with firm performance. These results are summarized in Appendix B.

Referring to Jian and Wong (2010), our control variables include *Lev*, measured as total debt over total assets; *Size*, measured as the natural logarithm of total assets; and *MTB*, measured as the market value divided by the book value of total equity at year-end.

### 3.3. Research model

To test Hypothesis 1, the following model is used:

$$NRPT = \beta_0 + \beta_1 PMC + \beta_2 PROS + \varepsilon \quad (2)$$

*PMC* is represented by three variables: *Num*, *HHI* and *CR4*. The relationship between *PMC* and *RPT* may be non-monotonic. Therefore, we rank firms according to their *PMC* and then sort them into *PMC* quintiles. *PMC\_H* is a dummy variable that is assigned a value of 1 when competition is in the highest quintile, and 0 otherwise. *PMC\_L* is a dummy variable indicating when *PMC* lies in the lowest quintile of its empirical distribution. In response to Jian and Wong (2010), we add *PROS* as an important control variable that is measured as the return on sales of the firm 1 year before the related party transaction occurs.

Table 1  
Variable definitions.

Variable	Definition
<i>Panel A: Product market competition variables</i>	
<i>PMC</i>	Product market competition represented by three variables: <i>Num</i> , <i>CR4</i> and <i>HHI</i>
<i>PMC_H</i>	One if <i>PMC</i> is in the highest quintile and zero otherwise
<i>PMC_L</i>	One if <i>PMC</i> is in the lowest quintile and zero otherwise
<i>Num</i>	Total number of companies in an industry, log of the number when regressed
<i>CR4</i>	$1 - \sum P_i$ , $P_i$ are the market shares of the four largest firms in an industry
<i>HHI</i>	$1 - \sum P_i^2$ , $P_i$ are the market shares of the firms
<i>Panel B: Ultimate controlling shareholder's cash flow rights variables</i>	
<i>CashR</i>	The product of the proportion of voting rights at different levels of the control chain
<i>Panel C: Normal related party transaction variables</i>	
<i>RPT</i>	Sum of related purchases and sales divided by total sales
<i>RPT_Purc</i>	Sum of related purchases of goods and services divided by total sales
<i>RPT_Sale</i>	Sum of related sales of goods and services divided by total sales
<i>NRPT</i>	Normal <i>RPT</i> following Jian and Wong (2010)
<i>NRPT_Purc</i>	Normal <i>RPT_Purc</i> following Jian and Wong (2010)
<i>NRPT_Sale</i>	Normal <i>RPT_Sale</i> following Jian and Wong (2010)
<i>Panel D: Control variables</i>	
<i>Lev</i>	Total debt over total assets
<i>Size</i>	Natural logarithm of total assets
<i>MTB</i>	Market value divided by book value of total equity at year-end
<i>PROS</i>	Net income of last year divided by total sales of last year

To explore the effect of the interaction between the ultimate controlling shareholder's cash flow rights (*CashR*) and product market competition (measured by *PMC*, or *PMC\_H* and *PMC\_L*), the following model is used. If product market competition and the ultimate controlling shareholder's cash flow rights are substitutes, then the coefficient of the interaction term will be negative.

$$NRPT = \beta_0 + \beta_1 CashR + \beta_2 PMC + \beta_3 CashR \times PMC + \beta_4 PROS + \varepsilon \quad (3)$$

In the presence of clustered errors, OLS estimates are still unbiased but standard errors may be incorrect, leading to incorrect inference in a surprisingly high proportion of finite samples (Petersen, 2009). Given this, we use standard errors clustered at the firm level for all of our regressions. The main variables are presented in Table 1.

## 4. Empirical analysis

### 4.1. Descriptive statistics of product market competition variables

All of the variables in the regressions are winsorized at the top and bottom 1 percentile across years to control for the potential influence of outliers. The final sample consists of 5954 firm-years, spanning the period from 2004 to 2009. We present the descriptive statistics of product market competition variables in Table 2 and use three different variables to measure the extent of product market competition. There is a significant difference in product market competition between industries. The variable *Num* shows that the most competitive industries are Equipment and Instrument Manufacturing (C7); Petroleum, Chemical, Plastics and Rubber Products Manufacturing (C4); and Metal and Non-metal (C6). The variable *CR4* shows that the most competitive industries are Equipment and Instrument Manufacturing (C7); Medicine and Biological Products (C8); and Textile, Apparel, Fur and Leather (C1). The variable *HHI* shows that Equipment and Instrument Manufacturing (C7), Medicine and Biological Products (C8) and Textile, Apparel, Fur and Leather (C1) are

Table 2  
Sample description.

Industries	2004	2005	2006	2007	2008	2009	Total	Coverage (%)	Num	CR4	HHI
Farming, Forestry, Animal Husbandry and Fishing (A)	20	23	25	22	24	23	137	2.30	38	0.49	0.90
Mining (B)	17	21	19	21	30	32	140	2.35	28	0.08	0.61
Food and Beverage (C0)	41	42	42	43	46	45	259	4.35	59	0.59	0.94
Textile, Apparel, Fur and Leather (C1)	43	47	47	54	52	48	291	4.89	66	0.74	0.97
Paper and Allied Products; Printing (C3)	17	20	22	26	27	26	138	2.32	31	0.48	0.90
Petroleum, Chemical, Plastics and Rubber Products Manufacturing (C4)	111	118	111	122	132	125	719	12.08	162	0.72	0.96
Electronics (C5)	33	37	37	40	52	51	250	4.20	62	0.42	0.88
Metal and Non-metal (C6)	103	104	109	116	123	118	673	11.30	137	0.72	0.96
Machinery, Equipment and Instrument Manufacturing (C7)	157	175	176	179	189	197	1073	18.02	233	0.78	0.98
Medicine and Biological Products (C8)	49	60	63	67	65	63	367	6.16	97	0.74	0.97
Other Manufacturing (C9)	11	14	13	16	16	17	87	1.46	23	0.39	0.88
Utilities (D)	33	45	43	46	50	47	264	4.43	63	0.54	0.92
Construction (E)	18	21	21	20	25	27	132	2.22	32	0.31	0.81
Transportation and Warehousing (F)	36	41	39	46	46	49	257	4.32	63	0.46	0.90
Information Technology (G)	53	60	57	58	68	63	359	6.03	94	0.40	0.83
Wholesale and Retail Trades (H)	43	44	41	46	46	51	271	4.55	92	0.61	0.94
Real Estate (J)	25	22	19	23	39	39	167	2.80	67	0.60	0.93
Public Facilities and Other Services (K)	18	19	18	23	28	28	134	2.25	45	0.60	0.92
Communication and Cultural Industries (L)	5	5	4	4	7	8	33	0.55	20	0.27	0.82
Conglomerates (M)	28	32	29	35	39	40	203	3.41	72	0.72	0.96
Subtotal	861	950	935	1007	1104	1097	5954				

Table 3  
Descriptive statistics.

Variables	N	Mean	Median	SD	Min	P25	P75	Max
NRPT	5954	0.170	0.176	0.071	0.029	0.110	0.223	0.350
NRPT_Purc	5207	0.098	0.098	0.039	0.021	0.068	0.124	0.198
NRPT_Sale	5013	0.098	0.100	0.042	0.010	0.067	0.125	0.237
Num	5954	115.524	68.336	20.000	63.000	94.000	154.000	269.000
CR4	5954	0.623	0.694	0.167	0.060	0.509	0.753	0.817
HHI	5954	0.929	0.957	0.070	0.583	0.915	0.969	0.982
CashR	5954	0.353	0.338	0.177	0.031	0.212	0.491	0.750
PROS	5954	0.050	0.048	0.166	-0.897	0.017	0.101	0.521

the top three competitive industries. In summary, the descriptive statistics are almost the same using our various proxy measures of product market competition.

#### 4.2. Descriptive statistics of normal RPT variables

We use Jian and Wong's (2010) model to estimate normal RPTs, normal related party purchases and normal related party sales. We use an OLS regression model to remove any abnormal RPT components that are not associated with industry classifications and the identified firm characteristics. The range and number of significant coefficients for the 6 years of regressions are reported in Appendix A. The RPT models have an adjusted R-square ranging from 0.041 to 0.079. The related party purchase models have an adjusted R-square ranging from 0.029 to 0.069. The related party sales models have an adjusted R-square ranging from 0.026 to 0.080.

Table 3 shows the variables' descriptive statistics. The mean (median) value of NRPT is 0.170 (0.176). After distinguishing the direction of RPTs, the results suggest that the mean (median) value of NRPT\_Purc is 0.098



Table 4  
Correlation analysis.

	<i>NRPT</i>	<i>Num</i>	<i>CR4</i>	<i>HHI</i>	<i>CashR</i>	<i>PROS</i>
<i>Panel A: NRPT</i>						
<i>NRPT</i>	1					
<i>Num</i>	0.447***	1				
<i>CR4</i>	0.270***	0.746***	1			
<i>HHI</i>	0.170***	0.608***	0.918***	1		
<i>CashR</i>	0.131***	-0.046***	-0.069***	-0.070***	1	
<i>PROS</i>	0.076***	-0.073***	-0.081***	-0.069***	0.113***	1
	<i>NRPT_Purc</i>	<i>Num</i>	<i>CR4</i>	<i>HHI</i>	<i>CashR</i>	<i>PROS</i>
<i>Panel B: NPRT_Purc</i>						
<i>NPRT_Purc</i>	1					
<i>Num</i>	0.327***	1				
<i>CR4</i>	0.239***	0.758***	1			
<i>HHI</i>	0.099***	0.544***	0.804***	1		
<i>CashR</i>	0.185***	-0.057***	-0.077***	-0.076***	1	
<i>PROS</i>	0.117***	-0.082***	-0.092***	-0.064***	0.111***	1
	<i>NRPT_Sale</i>	<i>Num</i>	<i>CR4</i>	<i>HHI</i>	<i>CashR</i>	<i>PROS</i>
<i>Panel C: NRPT_Sale</i>						
<i>NRPT_Sale</i>	1					
<i>Num</i>	0.343***	1				
<i>CR4</i>	0.127***	0.749***	1			
<i>HHI</i>	0.019*	0.543***	0.809***	1		
<i>CashR</i>	0.080***	-0.025*	-0.060***	-0.077***	1	
<i>PROS</i>	0.074***	-0.075***	-0.077***	-0.064***	0.112***	1

\*\* Statistically significant at the 5% level (two-tailed).

\* Statistically significant at the 10% level (two-tailed).

\*\*\* Statistically significant at the 1% level (two-tailed).

(0.098), and the mean (median) value of *NRPT\_Sale* is 0.098 (0.100). The variable *Num* measures the total number of companies in an industry and has a value ranging from 63 to 269.

#### 4.3. Correlation analysis

Person's correlation coefficients for the main variables in our analysis are reported in Table 4. Panel A shows that the correlations between *NRPT* and *PMC* (measured by *Num*, *CR4* and *HHI*) are positive and significant at the 1% level. As expected, we find a positive correlation between *NRPT* and *CashR*, and *NRPT* is also positively correlated with *PROS*. The correlation analysis is consistent when we change the dependent variable *NRPT* into *NPRT\_Purc* and *NRPT\_Sale*.

#### 4.4. Regression analysis

Table 5 reports the regression results for product market competition and normal related party transactions. As expected, the results in columns 1, 3 and 5 reveal that product market competition has a statistically significant positive effect on normal *RPTs*. In column 2, we use two dummy variables instead of the variable *Num*. The coefficients (*t*-values) of *Num\_L* and *Num\_H* are -0.014 (-3.86) and 0.057 (18.98). The results in columns 4 and 6 are similar to the results in column 2. In summary, these results indicate that product market competition is significantly positively related to normal *RPTs*.

Table 6 reports regression results when we replace the dependent variable *NRPT* with *NRPT\_Purc* and *NRPT\_Sale*. The empirical results are consistent with those in Table 5, which suggests that the extent of related party purchases and related sales increases with the level of competition. For example, the coefficients (*t*-values) of *Num*, *CR4* and *HHI* in columns (1) to (3) are 0.021 (17.55), 0.059 (9.25) and 0.042 (3.29), respec-

Table 5  
Regression results for *PMC* and *NRPT*.

	Dependent variable: <i>NRPT</i>					
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Num</i>	0.050*** (25.37)					
<i>Num_L</i>		-0.014*** (-3.86)				
<i>Num_H</i>		0.057*** (18.98)				
<i>CR4</i>			0.119*** (11.41)			
<i>CR4_L</i>				-0.042*** (-12.29)		
<i>CR4_H</i>				0.025*** (9.17)		
<i>HHI</i>					0.180*** (6.51)	
<i>HHI_L</i>						-0.035*** (-11.06)
<i>HHI_H</i>						0.025*** (7.66)
<i>PROS</i>	0.051*** (6.34)	0.038*** (4.89)	0.046*** (5.53)	0.044*** (5.97)	0.042*** (4.83)	0.032*** (4.28)
<i>Intercept</i>	-0.062*** (-6.36)	0.161*** (63.06)	0.094*** (13.87)	0.173*** (70.19)	0.000 (0.01)	0.152*** (32.29)
<i>N</i>	5954	5954	5954	5954	5954	5954
Adj. <i>R</i> -sq.	0.203	0.119	0.081	0.098	0.036	0.091
<i>N_clust</i>	1362	1362	1362	1362	1362	1362
<i>F</i>	362.388	215.464	83.814	158.730	33.334	57.597

\* Statistically significant at the 10% level (two-tailed).

\*\* Statistically significant at the 5% level (two-tailed).

\*\*\* Statistically significant at the 1% level (two-tailed).

Table 6  
Regression results for *PMC* and *NRPT\_Pure* (*NRPT\_Sale*).

	Dependent variable: <i>NRPT_Pure</i>			Dependent variable: <i>NRPT_Sale</i>		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Num</i>	0.021*** (17.55)			0.023*** (15.93)		
<i>CR4</i>		0.059*** (9.25)			0.032*** (5.72)	
<i>HHI</i>			0.042*** (3.29)			0.010 (1.23)
<i>PROS</i>	0.040*** (8.51)	0.039*** (8.22)	0.034*** (7.02)	0.029*** (4.80)	0.025*** (4.03)	0.023*** (3.63)
<i>Intercept</i>	0.001 (0.17)	0.059*** (14.52)	0.057*** (4.87)	-0.007 (-0.96)	0.077*** (20.12)	0.088*** (12.08)
<i>N</i>	5207	5207	5207	5013	5013	5013
Adj. <i>R</i> -sq.	0.127	0.078	0.027	0.11	0.021	0.006
<i>N_clust</i>	1260	1260	1260	1243	1243	1243
<i>F</i>	190.449	75.048	29.33	149.313	25.986	7.272

\* Statistically significant at the 10% level (two-tailed).

\*\* Statistically significant at the 5% level (two-tailed).

\*\*\* Statistically significant at the 1% level (two-tailed).

Table 7  
Regression results for *PMC*, *CashR* and *NRPT*.

	Dependent variable: <i>NRPT</i>		
	(1)	(2)	(3)
<i>Panel A</i>			
<i>CashR</i>	0.131 <sup>***</sup> (2.62)	0.121 <sup>***</sup> (3.44)	0.311 <sup>***</sup> (7.19)
<i>Num</i>	0.057 <sup>***</sup> (14.02)		
<i>Num</i> × <i>CashR</i>	−0.017 (−1.59)		
<i>CR4</i>		0.160 <sup>***</sup> (7.65)	
<i>CR4</i> × <i>CashR</i>		−0.104 <sup>*</sup> (−1.89)	
<i>HHI</i>			0.335 <sup>***</sup> (8.52)
<i>HHI</i> × <i>CashR</i>			−0.279 <sup>***</sup> (−5.96)
<i>PROS</i>	0.039 <sup>***</sup> (5.57)	0.035 <sup>***</sup> (4.59)	0.031 <sup>***</sup> (3.96)
<i>Intercept</i>	−0.111 <sup>***</sup> (−5.65)	0.048 <sup>***</sup> (3.58)	−0.162 <sup>***</sup> (−4.43)
<i>N</i>	5954	5954	5954
Adj. <i>R</i> -sq.	0.231	0.103	0.064
<i>N</i> _clust	1362	1362	1362
<i>F</i>	200.332	58.061	31.714
<i>Panel B</i>			
<i>CashR</i>	0.065 <sup>***</sup> (4.85)	0.063 <sup>***</sup> (4.98)	0.057 <sup>***</sup> (4.59)
<i>Num</i> _L	−0.010 (−1.42)		
<i>Num</i> _H	0.075 <sup>***</sup> (12.70)		
<i>CashR</i> × <i>Num</i> _L	−0.015 (−0.79)		
<i>CashR</i> × <i>Num</i> _H	−0.055 <sup>***</sup> (−3.26)		
<i>CR4</i> _L		−0.033 <sup>***</sup> (−4.78)	
<i>CR4</i> _H		0.038 <sup>***</sup> (6.67)	
<i>CashR</i> × <i>CR4</i> _L		−0.027 (−1.46)	
<i>CashR</i> × <i>CR4</i> _H		−0.037 <sup>**</sup> (−2.29)	
<i>HHI</i> _L			−0.029 <sup>***</sup> (−4.50)
<i>HHI</i> _H			0.033 <sup>***</sup> (4.86)
<i>CashR</i> × <i>HHI</i> _L			−0.016 (−0.94)
<i>CashR</i> × <i>HHI</i> _H			−0.023 (−1.24)
<i>PROS</i>	0.032 <sup>***</sup> (4.11)	0.038 <sup>***</sup> (5.27)	0.032 <sup>***</sup> (4.28)
<i>Intercept</i>	0.139 <sup>***</sup> (28.65)	0.151 <sup>***</sup> (32.00)	0.152 <sup>***</sup> (32.29)
<i>N</i>	5954	5954	5954

Adj. <i>R</i> -sq.	0.138	0.115	0.091
<i>N</i> _clust	1362	1362	1362
<i>F</i>	120.492	89.916	57.597

\* Statistically significant at the 10% level (two-tailed).

\*\* Statistically significant at the 5% level (two-tailed).

\*\*\* Statistically significant at the 1% level (two-tailed).

Table 8

Regression results for *PMC*, *CashR* and *NRPT\_Purc* (*NRPT\_Sale*).

	Dependent variable: <i>NRPT_Purc</i>			Dependent variable: <i>NRPT_Sale</i>		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>CashR</i>	0.067** (2.24)	0.081*** (3.93)	0.188*** (3.14)	0.117*** (3.42)	0.045** (2.50)	0.110*** (3.31)
<i>Num</i>	0.023*** (9.39)			0.031*** (11.06)		
<i>Num</i> × <i>CashR</i>	−0.006 (−0.87)			−0.022*** (−3.12)		
<i>CR4</i>		0.084*** (6.81)			0.050*** (4.33)	
<i>CR4</i> × <i>CashR</i>		−0.063* (−1.92)			−0.042 (−1.54)	
<i>HHI</i>			0.114*** (3.44)			0.056*** (2.85)
<i>HHI</i> × <i>CashR</i>			−0.161** (−2.50)			−0.100*** (−2.73)
<i>PROS</i>	0.031*** (7.58)	0.030*** (7.01)	0.026*** (5.82)	0.023*** (4.37)	0.020*** (3.53)	0.018*** (3.12)
<i>Intercept</i>	−0.024** (−2.12)	0.028*** (3.65)	−0.024 (−0.76)	−0.052*** (−3.76)	0.059*** (7.70)	0.039** (2.16)
<i>N</i>	5207	5207	5207	5013	5013	5013
Adj. <i>R</i> -sq.	0.163	0.115	0.063	0.137	0.030	0.013
<i>N</i> _clust	1260	1260	1260	1243	1243	1243
<i>F</i>	116.729	63.219	26.592	85.194	16.642	7.745

\* Statistically significant at the 10% level (two-tailed).

\*\* Statistically significant at the 5% level (two-tailed).

\*\*\* Statistically significant at the 1% level (two-tailed).

tively. In summary, the results provide evidence for Hypothesis 1, which states that product market competition is significantly positively related to normal *RPTs*.

We then examine the interaction effect of product market competition and the ultimate controlling shareholder's cash flow rights on normal *RPTs*. Panel A of Table 7 presents the results of estimating Eq. (3). The continuous variables *Num*, *CR4* and *HHI* are used as the proxy variables for *PMC* in Panel A and the dummy variables are used in Panel B. The coefficients of *CashR* in columns (1) to (3) are 0.131, 0.121 and 0.311, respectively. They are all statistically significant at the 1% level. Similar to the results in Table 5, the coefficients of *Num*, *CR4* and *HHI* are significantly positive. The results show that both product market competition and the ultimate controlling shareholder's cash flow rights have significant positive effects on normal *RPTs*. The coefficients (*t*-values) of the interaction terms *Num* × *CashR*, *CR4* × *CashR* and *HHI* × *CashR* are −0.017 (−1.59), −0.104 (−1.89) and −0.279 (−5.96), respectively. These results are consistent with Hypothesis 2, suggesting that the ultimate controlling shareholder's cash flow rights have more influence on normal *RPTs* in firms in noncompetitive industries than in firms in competitive industries. This implies that product market competition is a substitute for internal corporate governance mechanisms. The results of Panel B further suggest that this substitution only occurs at higher levels of competition.

In Table 8, we replace the dependent variable *NRPT* with *NRPT\_Purc* and *NRPT\_Sale*. Consistent with the results in Table 7, the coefficients of the interaction terms are generally significantly negative.

These results indicate that product market competition and the ultimate controlling shareholder's cash flow rights have an interaction effect on normal *RPTs*, with the ultimate controlling shareholder's cash flow rights in noncompetitive industries being more likely to increase normal *RPTs*. Our results are consistent with Karuna (2010) and Giroud and Mueller (2011) in that product market competition can act as a substitute for internal corporate governance mechanisms.

## 5. Conclusion

Based on a sample of A-share Chinese listed firms from 2004 to 2009, we examine the effect of product market competition and the ultimate controlling shareholder's cash flow rights on normal *RPTs*. Product market competition is not only pivotal in influencing corporate strategies, but can also be a substitute for internal governance mechanisms.

We adopt Jian and Wong's (2010) approach to estimate normal *RPTs*. Our empirical evidence shows that product market competition has a significant positive effect on normal *RPTs*. This implies that firms in competitive industries can increase normal *RPTs* to reduce transaction costs. Further investigation shows that product market competition and the ultimate controlling shareholder's cash flow rights have an interaction effect on normal *RPTs*, with the ultimate controlling shareholder's cash flow rights in noncompetitive industries being more likely to improve normal *RPTs*. This provides evidence that product market competition can act as a substitute for the ultimate controlling shareholder's cash flow rights on normal *RPTs*.

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## Appendix A. Normal *RPT* regressions

	2004	2005	2006	2007	2008	2009
<i>Panel A: Normal RPT</i>						
<i>Lev</i>	-0.231*** (-4.24)	-0.146*** (-2.93)	-0.129*** (-2.71)	-0.116** (-2.38)	-0.121*** (-2.85)	-0.031 (-0.75)
<i>Size</i>	0.053*** (5.11)	0.026*** (2.73)	0.024*** (2.95)	0.024*** (3.08)	0.022*** (3.09)	0.011 (1.57)
<i>MTB</i>	0.032*** (2.81)	0.001 (0.12)	-0.004 (-0.59)	0.003 (0.88)	0.008 (1.22)	0.007** (2.17)
Intercept	-0.908*** (-4.11)	-0.344* (-1.68)	-0.321* (-1.81)	-0.340** (-2.03)	-0.320** (-2.13)	-0.152 (-0.99)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	950	978	999	1078	1148	1154
Adj. <i>R</i> -sq.	0.079	0.068	0.057	0.041	0.064	0.055
<i>F</i>	6.400	5.762	5.051	4.043	5.603	4.508
<i>Panel B: Normal related party purchases</i>						
<i>Lev</i>	-0.147*** (-4.36)	-0.070** (-2.11)	-0.098*** (-3.05)	-0.061* (-1.91)	-0.045 (-1.57)	-0.007 (-0.27)
<i>Size</i>	0.031*** (4.79)	0.013** (2.10)	0.020*** (3.53)	0.016** (3.13)	0.013*** (2.72)	0.009* (1.85)
<i>MTB</i>	0.014**	-0.005	-0.002	0.001	0.004	0.003

	2004	2005	2006	2007	2008	2009
Intercept	(1.96) −0.504*** (−3.67)	(−0.57) −0.145 (−1.08)	(−0.33) −0.272** (−2.28)	(0.56) −0.235** (−2.12)	(0.83) −0.202** (−2.00)	(1.42) −0.143 (−1.40)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	829	852	866	944	1010	1003
Adj. <i>R</i> -sq.	0.069	0.043	0.043	0.029	0.046	0.037
<i>F</i>	5.745	3.698	3.808	3.042	4.009	3.156
<i>Panel C: Normal related party sales</i>						
<i>Lev</i>	−0.151*** (−3.48)	−0.123*** (−3.31)	−0.059* (−1.69)	−0.095*** (−2.67)	−0.086*** (−2.67)	−0.041 (−1.29)
<i>Size</i>	0.025*** (3.14)	0.009 (1.35)	−0.001 (−0.21)	0.007 (1.30)	0.001 (0.10)	−0.003 (−0.56)
<i>MTB</i>	0.020* (1.91)	0.007 (0.87)	−0.003 (−0.51)	0.005* (1.75)	0.005 (1.07)	0.006* (2.20)
Intercept	−0.347** (−2.04)	−0.069 (−0.46)	0.138 (1.07)	−0.037 (−0.31)	0.079 (0.70)	0.117 (1.02)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	782	808	836	915	979	977
Adj. <i>R</i> -sq.	0.029	0.080	0.057	0.026	0.035	0.050
<i>F</i>	2.813	5.990	4.616	2.769	3.241	3.878

\* Statistically significant at the 10% level (two-tailed).

\*\* Statistically significant at the 5% level (two-tailed).

\*\*\* Statistically significant at the 1% level (two-tailed).

## Appendix B. Correlation analysis

	<i>NRPT</i>	<i>ROA</i>	<i>ROE</i>	<i>ROS</i>
<i>Panel A: Normal RPTs and firm performance</i>				
<i>NRPT</i>	1.000			
<i>ROA</i>	0.142***	1.000		
<i>ROE</i>	0.068***	0.367***	1.000	
<i>ROS</i>	0.030***	0.408***	0.154***	1.000
	<i>AbRPT</i>	<i>ROA</i>	<i>ROE</i>	<i>ROS</i>
<i>Panel B: Abnormal RPTs and firm performance</i>				
<i>AbRPT</i>	1.000			
<i>ROA</i>	−0.046***	1.000		
<i>ROE</i>	−0.075***	0.367***	1.000	
<i>ROS</i>	−0.061***	0.408***	0.154***	1.000

\* Statistically significant at the 10% level (two-tailed).

\*\* Statistically significant at the 5% level (two-tailed).

\*\*\* Statistically significant at the 1% level (two-tailed).

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