

Trade Credit and Agency Cost: A Study of Korean Chaebols*

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Abstract

Do chaebols use trade credit in internal transactions? If so, is it a reflection of agency cost? Trade credit has been shown to be an important source of capital for modern corporations. Given the prevalence of internal capital market and also within-chaebol transactions, it is plausible that chaebol members use trade credit for the purpose of within-chaebol resource allocation. After examining the financial statement data of Korean chaebols as well as non-chaebol firms between year 2005 and 2011, we find that chaebol members provide and receive more trade credit than non-chaebol firms do. Our analysis suggests that this ‘excessive’ flow of trade credit associated with chaebol firms reflects agency cost.

Keywords:

Trade credit, agency cost, chaebol, internal capital market, internal transaction

JEL Classifications:

D20, G30, G32, G34

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1. Introduction

An upstream supplier firm may provide credit to its downstream customer firm in the form of short-term delayed payment, which appears on its balance sheet as “accounts receivable.” The customer firm purchasing inputs and receiving such credit notes it on its balance sheet as “accounts payable.” Credit provision may also flow in the opposite direction as for example when the downstream firm pays prior to input delivery. In such a case, the payment is recorded as “prepaid expense” by the downstream firm and as “advance revenue” by the upstream firm. Delayed and advance payments are collectively known as trade credit. Trade credit is an important source of non-financial institution credit in both developed and emerging markets. For example, accounts receivable represent approximately 15% of corporate assets in the US¹. In Korea, the corresponding figure is about 19%².

Why do firms provide and receive trade credit? One answer (“information asymmetry theory”)³ is that trade credit is a cheaper alternative to bank credit under information asymmetry. Business partners may know more about each other than banks do, and this makes lending between business partners more efficient than bank lending. Biais and Gollier (1997) and Burkart and Ellingsen (2004) formalize this idea. Another interesting answer (“externality theory”) is given by Daripa and Nilsen (2011). In their model, trade credit is offered as a way to reduce the production-externality problem. One firm’s production may benefit its partner in a vertical relationship. Then one with higher margin may decide to subsidize the production of the partner through trade credit. A third answer (“monopoly theory”) is less theoretically motivated, but quite popular among the public.⁴ According to this idea, trade credit reflects exploitation

¹See Petersen and Rajan (1997) and Nilsen (2002). Wilner (2000) proclaims, “trade credit is the largest source of short-term financing for American corporations.”

² Based on the non-financial firms between year 2005 and 2008.

³ The information asymmetry theory has been developed out of a long-standing idea called the substitution hypothesis: trade credit is a substitute for bank credit. A related idea, redistribution hypothesis, suggests that better firms are offered more bank credit, and that they share it with less creditworthy partner firms through trade credit. Petersen and Rajan (1997), Nilsen (2002), and Fisman and Love (2003) discuss various aspects of these ideas.

⁴Media often characterizes delayed payment as an example of ‘abuse of market power’ by large customer firms. According to a July 28, 2012 article of Korea Times (title: Minister voices concern on corporate bashing), Knowledge Economy Minister Hong Suk-Woo “pointed out that most of the criticism of chaebol stems from their wrong business practices, such as *delaying payments* or demanding excessive discounts from smaller suppliers.” According to a May 16, 2013 article of Korea Herald (title: FTC expands antitrust probe into companies), the Fair

by monopoly firms of smaller partner firms. Giannetti, Burkart, and Ellingsen (2011), and Klapper, Laeven, and Rajan (2012) discuss this idea, but without a formal model⁵.

These explanations, however, seem inadequate when they are applied to Korean chaebols. Chaebol member firms are unlikely to have financing difficulty due to information asymmetry. Also, members of a chaebol group have other, probably better, means to solve the production-externality problem.

Exploitation by one member firm of another member firm is also very unlikely. If one member firm provides trade credit to another member firm, its motivation is probably more to do with ‘internal resource allocation’ than with any of the reasons that existing theories have focused on. The importance of the internal resource allocation for chaebols has been well documented. For example, Friedman, Johnson, and Mitton (2003) discuss tunneling phenomenon (the transfer of cash flows from chaebol members to the owners’ relations at the expense of minority shareholders), and Bae, Cheon, and Kang (2008) discuss propping phenomenon (the transfer of cash flows to troubled chaebol members in favor of minority shareholders). Considering these findings, the use of trade credit for the purpose of internal resource allocation is highly plausible.

In this paper, we explore the agency-cost view of trade credit by Korean chaebols. We first document that chaebol firms record more trade credit, both provision and receipt, than non-chaebol firms. Not having individual transaction data, we cannot observe whether trade credit of a chaebol firm is provided by another member firm, or by a non-chaebol business partner. Nonetheless, by carefully controlling for firm characteristics that are likely to affect the level of trade credit, we can isolate the “chaebol effect,” i.e. the excess trade credit associated with being a chaebol member. Furthermore, we document positive association between trade credit and transaction with affiliates, which suggests that excess trade credit flows to and from other chaebol members. A more direct measure of potential agency cost, the ratio of voting right to cashflow right of the controlling shareholder (“voting right multiplier”) helps to explain excess trade credit as well, either directly or indirectly through transaction with affiliates. Our empirical

Trade Commission “launched an inquiry into Cheil Worldwide Inc., an advertising unit of Samsung Group, on suspicions that it forced price cuts or *delayed payment* in deals with its subcontractors.”

⁵ We of course did not mention all the important theories of trade credit. Perhaps the most important omissions are the price discrimination theory (that trade credit is a means for price discrimination) and the warranty-for-product-quality theory (that offering trade credit amounts to offering a warranty for product quality). See Petersen and Rajan (1997) and Long, Malitz, and Ravid (1993).

analysis is based on the financial statement data of Korean chaebols as well as non-chaebol firms between year 2005 and 2011,

The rest of the paper is organized as follows. Section 2 discusses hypothesis. Section 3 explains data. Section 4 includes the results of empirical analysis, and Section 5 concludes. Details on data source and variable definition are included in the appendix.

2. Hypothesis

We briefly review existing explanations of trade credit and relate them to our hypothesis. Quite a few explanations of trade credit exist, but three of them--the information-asymmetry theory, the externality theory, and the monopoly theory--capture most of the important dimensions, so we focus on them.

In the information-asymmetry theory, trade credit is a cheaper alternative to bank credit. Firms take trade credit because obtaining it is cheaper than obtaining bank credit; firms offer trade credit because doing so is beneficial to them. Such situation may arise if capital markets are imperfect because of information asymmetry. Firms in supplier-customer relationship have information advantage over banks. Thus, firms in such relationship may have comparative advantage in providing credit to partner firms if they have enough credit for themselves. Biais and Gollier (1997) and Burkart and Ellingsen (2004) develop this idea into a formal theory. In our view, however, this theory is unlikely to explain trade credit flow among members of a chaebol group. Chaebol members may have informational advantage over banks. However, chaebol members are unlikely to be victims of information asymmetry; chaebol members tend to have good access to capital markets, and if they have difficulty in obtaining bank credit, it probably reflects bad fundamentals.

In the externality theory of Daripa and Nilsen (2011), a rational downstream firm trades off inventory holding costs against lost sales. Any lost final sales however impose a negative externality on the upstream firm supplying inputs. An instrument the upstream firm can use to induce the downstream firm to internalize the externality is to offer delayed payments (delivering an inventory subsidy). This situation is more likely to occur if the downstream firm has a small unit profit margin. In the case when the downstream firm has a large margin while the upstream firm has a small margin, the theory predicts that the downstream firm will provide an inventory subsidy to the upstream firm, i.e. the downstream firm will

prepay for inputs. The applicability of this theory to chaebol members can be limited if chaebol member firms do not behave independently. It is often argued that the role of chaebol headquarters is exaggerated by critics; however, it is not true either to say that chaebol member firms are completely independent.

In the monopoly theory of trade credit, a larger firm--often a monopolist--receives trade credit from a smaller firm. This pattern cannot be explained by comparative advantage. The smaller firm probably faces higher borrowing cost than the larger firm; it will be more efficient if the larger firm borrows directly from a bank, and demands price adjustment instead from the smaller firm. Price adjustment may, however, not be feasible perhaps due to regulation. Thus, the larger firm takes trade credit even though doing so is not efficient. Giannetti, Burkart, and Ellingsen (2011), and Klapper, Laeven, and Rajan (2012) discuss some implications of this theory, but they do not present a formal model. In our view, this theory has a limited applicability to trade credit between chaebol members. It is unlikely that one chaebol member shows predatory behavior to other chaebol members.

Our hypothesis focuses on the resource-allocation motive of trade credit. The importance of the internal resource allocation for chaebols has been well documented. Theoretically, as Stein (1997) and Scharfstein and Stein (2000) have shown, internal resource allocation may have both efficiency-enhancing and efficiency-reducing effects. Efficiency-enhancing effect may be more important if, for example, rent-seeking behavior of corporate managers can be properly checked. Evidence indicates, however, that internal resource allocation often has negative consequences. Tunneling and propping phenomena are two examples. We hypothesize that trade credit is used as another means to move resources among chaebol members. We also hypothesize that trade credit is more prevalent when the magnitude of potential agency cost is greater. We measure potential agency cost by the magnitude of within-chaebol transactions and also by the ratio of voting right to cashflow right of the controlling shareholder.

3. Data

We have collected financial statement data of all Korean firms that filed annual statements with Korea Financial Supervisory Services (the Korean counterpart of US Securities Exchange Commission) between year 2005 and 2011. While the majority of these firms are public firms whose shares are traded in stock exchanges, some large private firms are also included. After excluding financial firms, our sample

includes 23,766 firms. All the financial statement data are from KIS-VALUE (a database comparable to Compustat).

We identify chaebols as those firms in the government-maintained list of “conglomerates subject to cross-shareholding restriction.” Korea Fair Trade Commission maintains this list, which is updated once a year. From the web site of Korea Fair Trade Commission, we have obtained the voting right multiplier of each chaebol between year 2005 and 2008. The voting right multiplier is defined as the ratio of the voting right to the cashflow right of the controlling shareholder. It indicates the discrepancy between ownership and control of the controlling shareholder. (The controlling shareholder typically holds the “chairman” title of the largest member firm.) Chaebol members are required to report transactions with affiliates, in Annual Audit Report that is filed at Korea Financial Supervisory Services. In principle, four variables can be constructed from Annual Audit Report: (i) sales to affiliates, (ii) income from affiliates, (iii) purchase from affiliates, and (iv) expense paid to affiliates. However, distinction between (i) and (ii) and also between (iii) and (iv) are not reliable, so we have added (ii) to (i), and also (iii) to (iv).

Table 1 shows the summary statistics for four measures of trade credit, for the whole sample and for the chaebol sample. The following observations can be made. First, delayed payment is more prevalent than advance payment. While delayed payment makes up more than 13% of sales and cost, advance payment accounts for less than 6% of sales and cost. Second, it appears that chaebol firms use less of delayed payment, and more of advance payment, than non-chaebol firms do. This turns out not to be the case once we control for other factors. We show later that chaebol firms use more of all types of trade credit. Note that our sample is not a closed system. Firms in our sample provide and receive trade credit to and from firms outside our sample. Otherwise, the receivable ratio would have been comparable to the payable ratio, and also the prepaid expense ratio would have been comparable to the advance revenue ratio.

[Table 1 to be inserted here.]

4. Results

4.1. Receivable and Payable Ratios

We first estimate “baseline” regression equations for the receivable and payable ratios. These equations are constructed to highlight the implications of the three theories of trade credit that we have reviewed in Section 2. The information asymmetry theory suggests that more creditworthy firms (or firms that appear more creditworthy in the eyes of bank credit analysts) provide trade credit to less creditworthy firms (or firms that appear so). To proxy creditworthiness, we include three variables: sales, profit margin, and the debt-to-equity (D/E)⁶. The externality theory suggests that firms with higher margin provide trade credit to firms with lower margin to induce inventory buildup. We capture externality by profit margin and two inventory variables--the final goods inventory (FGI) for the sales-related trade credit and the raw materials inventory (RMI) for the purchase-related trade credit. The monopoly theory suggests that firms with more market power receive trade credit from firms with less market power. We interpret sales as a proxy for market power⁷. We also include year dummy variables as well as industry dummy variables in the regression. In sum, our baseline regression equations include the following variables: sales, profit margin, D/E, FGI, RMI, and year and industry dummies.

Note that the receivable ratio is defined as the ratio of account receivable to sales. Thus, sales appear in the left hand side as well as the right hand side of the equations for the receivable ratio. Ignoring other terms of the equation, we have:

$$\log(\text{account receivable}) - \log(\text{sales}) = a + b \cdot \log(\text{sales})$$

We may re-write the above equation as

$$\log(\text{account receivable}) = a + (1+b) \cdot \log(\text{sales})$$

Not including sales as an explanatory variable amounts to restricting (1+b) to be exactly one. There is no ex-ante reason to impose such restriction. Also data reject this restriction. So we include the sales as an explanatory variable.

Table 2 shows the results of baseline regressions. Recall that high sales, high profit margin, and low D/E indicate creditworthiness; thus, according to the information asymmetry theory, sales and profit margin are expected to have positive relation to the receivable ratio and negative relation to the payable ratio; D/E is expected to have negative relation to the payable ratio and positive relation to the receivable ratio.

⁶As a measure of profitability, we may use return-on-equity instead of profit margin. We choose the profit margin as this variable is also related to externality and we would like to keep the variable list short.

⁷We have experimented with the market share variable, but it has almost zero explanatory power. Our regressions include industry dummy variables; to the extent that industry dummies control for industry effects, market share does not have extra information over sales.

The results are only partially consistent with these predictions. D/E has the expected signs, both for the receivable ratio and for the payable ratio. Profit margin has the expected positive sign for the receivable ratio, but the unexpected positive sign for the payable ratio. Sales have the unexpected signs both for the receivable ratio and for the payable ratio. As for the externality theory, the predictions of the theory are only partially realized as well. The externality theory predicts profit margin to be positively related to the receivable ratio and negatively related to the payable ratio, just as the information asymmetry theory predicts. The externality theory predicts inventory to be negatively related to the receivable ratio and positively related to the payable ratio. Only half of these predictions are realized. The evidence for the monopoly theory is strongest. The negative and signs of sales in the receivable and payable ratio equations are as predicted by the monopoly theory: Smaller firms provide trade credit to larger firms. In sum, the results in Table 2 provide partial support for the information asymmetry theory and the externality theory and stronger support for the monopoly theory. In any case, all of our variables--sales, profit margin, D/E, inventory--are highly significant.

[Table 2 to be inserted here.]

We now proceed to the examination of our main hypothesis. The first piece of evidence in support of our hypothesis is what we call “chaebol effect”: chaebol membership increases the provision and receipt of trade credit. Table 3 shows that, when the chaebol dummy variable is included in the regression, it is highly significant across specifications. For the receivable ratio equation, the coefficient on chaebol dummy is 11% when inventory is not included and 5% when inventory is included. That is, chaebol membership increases the receivable ratio by more than 5%⁸. For the payable ratio, chaebol membership increases the ratio by more than 13%.

[Table 3 to be inserted here.]

What generates the ‘excess flow’ of trade credit shown above? Columns (1) and (4) of Table 4 show that the trade credit of chaebol firms are positively related to the amount of transactions with affiliates. That is, if a chaebol member buys more from affiliates, this member tends to provide more trade credit to its suppliers. Also, if a chaebol member sells more to affiliates, it tends to receive more trade credit from its customer firms. This pattern excludes the possibility that chaebol firms provide more trade credit to, and

⁸Using the approximation $\log(1+x) = x$ when x is a small number.

receive more trade credit from, non-chaebol firms. Excess flow of trade credit is occurring within chaebols.

[Table 4 to be inserted here.]

The amount of transaction with affiliates is an indicator of potential agency cost. Regressions in Table 5 show that transaction with affiliates is significantly correlated with the voting right multiplier. The voting right multiplier shows the difference between legal ownership and actual control of the controlling shareholder; this difference creates the principal-agent problem between the controlling shareholder and other shareholders. See Claessens, Djankov, and Lang (2000) and Bebchuk, Kraakman, and Triantis (2000). By adjusting the contract terms of transactions between affiliates, the controller of chaebols can move resources from one member to another member. Two important contract terms are price and the date of payment. The adjustment of the latter becomes the provision or receipt of trade credit.

[Table 5 to be inserted here.]

As shown above, the voting right multiplier affects the flow of trade credit indirectly through transactions with affiliates; it can also affect the flow of trade credit more directly. Columns (2), (3), (5), and (6) of Table 4 show the regressions where the voting right multiplier is included as an explanatory variable. The voting right multiplier turns out to be significant for the payable ratio, though not for the receivable ratio. Overall, the regressions in Table 4 indicate that trade credit is positively associated with measure of potential agency cost, be it transactions with affiliates or the voting right multiplier.

4.2. Prepaid Expense and Advance Revenue Ratios

We repeat the analysis of the previous subsection for the prepaid expense and advance revenue ratios. Prepaid expense and advance revenue involve prepayment, i.e. a payment prior to delivery. Prepayment is a mirror image of delayed payment: the theories that we reviewed earlier have exactly opposite implications for prepayment and delayed payment. There are some asymmetries, however. Prepayment and delayed payment create somewhat different kind of “counter-party risk”: the risk of not receiving

goods and the risk of not receiving money. This might explain why prepayment is much less common than delayed payment, as shown in Table 1⁹.

We briefly summarize the results that are different from those of the previous subsection. In the baseline regression equations reported in Table 6, two things are different from the previous result in Table 2: sales have negative influence on the payable ratio, and D/E has positive influence on the receivable ratio. That large firms receive less prepayment is consistent with the information asymmetry theory; however, other implications of the information asymmetry theory are not strongly supported by Table 6. That high D/E firms provide more prepayment might be explained by the need to reduce default risk. In Table 7, the chaebol effect is as strong as in the previous subsection. In Table 8, agency variables are less significant than in the previous subsection. Transactions with affiliates do not help to explain the flow of trade credit. The voting right multiplier is significant only for the prepaid expense ratio, but not for the advance revenue ratio. Overall, we find somewhat weaker evidence for our thesis from the prepaid expense and advance revenue ratios.

[Table 6 to be inserted here.]

[Table 7 to be inserted here.]

[Table 8 to be inserted here.]

5. Conclusion

We have shown that chaebol membership is associated with higher-than-usual trade credit. The excess trade credit of chaebol firms are correlated with two measures of potential agency cost: transactions with affiliates and the voting right multiplier. These findings are consistent with the possibility that chaebols use trade credit for the purpose of internal resource allocation, and that such internal resource allocation reflects the agency cost arising from the ownership-control separation.

⁹Perhaps this is a historically determined pattern. We do not have a convincing explanation for greater popularity of delayed payment over pre-payment.

Our empirical evidence is stronger for the trade credit measures related to delayed payment, i.e. the account receivable and the account payable. It is weaker for the prepayment-related measures, i.e. the prepaid expense ratio and the advance payment ratio. It is possible that prepayment is not a preferred means for within-chaebol resource allocation. We do not have an explanation for this at the moment. Our argument could be strengthened if we have transactions-level data. Such data are not available to the authors, unfortunately. Despite these limitations, our analysis highlights a channel for within-chaebol resource allocation that has been overlooked by researchers.

Appendix: Variable Definition

Four measures of trade credit: *Account receivable* is calculated as the sum of account receivable trade (KIS-VALUE item number 111150) and long-term account receivable trade (112216). Only those amounts related to the sales of goods are included. Those related to sales of asset, interest and other income are not included. Missing values are replaced with 0. (Only an insignificant number of firm-years have zero account receivable; omitting them do not influence our analysis substantively.) *Account payable* is the sum of account payable trade (115110) and long-term account payable trade (116270). Again, those related to purchase of assets, interest, and other payment are excluded. *Prepaid expense* is the sum of four items: prepaid expense-trade (111410), long-term prepaid expense trade (112251), short-term deposit (111430), and long-term deposit (112261). Only those prepayment related to the purchase of inputs are included. Deposits are also related to the purchase of inputs. Those related to interest and other payments are excluded. *Advance revenue* is the sum of four items: advance revenue trade (115150), long-term advance revenue trade (116280), short-term accepted deposits (115171), and long-term accepted deposits (116805). Only those prepayment related to the purchase of inputs are included. Those related to interest and other payments are excluded.

Explanatory variables of the baseline regressions: *Profit margin* is the ratio of sales (121000) to cost of goods sold (122000) minus one. If either sales or cost of goods sold is missing, the firm-year is dropped. *Debt-to-equity ratio* (D/E) is the ratio of total liability (118000) to total asset (115000) minus one. If either total liability or total asset is missing, the firm-year is dropped. *Final goods inventory* (FGI) is the sum of ‘purchased goods’ inventory (111310) and manufactured goods inventory (111320). Purchased goods refer to the products that the firm purchases with a plan to resell without modifying substantively.

Raw material inventory (RMI) is calculated as the difference between total inventory (111400) and final goods inventory.

Chaebol variables: *Sales-affiliates* are the sum of sales to affiliates (0A2053) and income from affiliates (0A2052) divided by sales. It is censored at 0 and 1. *Purchase-affiliates* is the sum of purchase from affiliates (0A2054) and expense paid to affiliates (0A2051) divided by the cost of goods sold. It is also censored at 0 and 1. *Voting right multiplier* is the ratio of the percentage voting right to the percentage cashflow right of the controlling shareholder. This variable is calculated at the chaebol level, not at the member firm level.

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Tables

Table 1. Four Measures of Trade Credit and their Summary Statistics

Delayed payment is recorded under “account receivable” by the receiver (the downstream firm), and under “account payable” by the payer (the upstream firm). Advance payment is recorded under “prepaid expense” by the payer, and under “advance revenue” by the receiver. To make ratios, receivable and advance revenue are divided by sales, and payable and prepaid expenses are divided by cost of goods sold (CGS). All non-financial Korean firms which submitted annual statements to Korea Financial Supervisory Services between 2005 and 2011 are included. Chaebol members are identified by Korea Fair Trade Commission.

A. All firm-years (N=121995)

	<u>In the form of delayed payment</u>		<u>In the form of advance payment</u>	
	Provision of credit (Receivable/sales)	Receipt of credit (Payable/CGS)	Provision of credit (Prepaid expense/CGS)	Receipt of credit (Adv revenue/sales)
Mean	0.1645	0.1298	0.0575	0.0319
SD	(0.1355)	(0.1303)	(0.1091)	(0.0954)

B. Chaebol members only (N=5287)

	<u>In the form of delayed payment</u>		<u>In the form of advance payment</u>	
	Provision of credit (Receivable/sales)	Receipt of credit (Payable/CGS)	Provision of credit (Prepaid expense/CGS)	Receipt of credit (Adv revenue/sales)
Mean	0.1573	0.1256	0.0641	0.0369
SD	(0.1218)	(0.1231)	(0.1226)	(0.1005)

Table 2.Receivable and Payable Ratios: Baseline Regressions

Dependent variables are listed in the top row; explanatory variables are listed in the first column. Every regression includes year dummies (7 of them, 2005 to 2011) and industry dummies (73 of them, based on KSIC9). Margin is defined as sales/cost of goods sold(CGS) - 1. Debt-to-equity ratio (D/E) is the ratio of total liability to total asset. Raw material inventory (RMI) include all types of inventory that are not final goods inventory (FGI). All non-financial Korean firms which submitted annual statements to Korea Financial Supervisory Services between 2005 and 2011 are included. However, firm-years with missing values are excluded. Significance at 10% and 5% are indicated by * and **, respectively.

	log(receivable/sales)		log(payable/CGS)	
	(1)	(2)	(3)	(4)
log(sales)	-0.039 (0.002) **	-0.041 (0.003) **	0.079 (0.003) **	0.080 (0.003) **
log(margin)	0.036 (0.003) **	0.050 (0.004) **	0.176 (0.004) **	0.181 (0.004) **
log(D/E)	-0.017 (0.003) **	-0.029 (0.003) **	0.283 (0.003) **	0.277 (0.003) **
log(FGI/sales)		0.036 (0.002) **		
log(RMI/CGS)				0.007 (0.001) **
N	110874	82764	108563	93667
Adj. R sq.	0.175	0.198	0.141	0.149

Table 3.Receivable and Payable Ratios: Chaebol Effect

Dependent variables are listed in the top row; explanatory variables are listed in the first column. Every regression includes year dummies (7 of them, 2005 to 2011) and industry dummies (73 of them, based on KSIC9). Chaebol dummy is 1 if the firm is a member of chaebol at the given year, and 0 otherwise. Chaebol membership is according to Korea Fair Trade Commission. See Table 2 notes for brief explanation of other variables. All non-financial Korean firms which submitted annual statements to Korea Financial Supervisory Services between 2005 and 2011 are included. Numbers inside the parenthesis are standard errors. Significance at 10% and 5% are indicated by * and **, respectively.

	log(receivable/sales)		log(payable/CGS)	
	(1)	(2)	(3)	(4)
Chaebol dummy	0.114 (0.016) **	0.053 (0.017) **	0.149 (0.019) **	0.127 (0.020) **
log(sales)	-0.044 (0.003) **	-0.044 (0.003) **	0.071 (0.003) **	0.073 (0.003) **
log(margin)	0.035 (0.003) **	0.049 (0.004) **	0.175 (0.004) **	0.180 (0.004) **
log(D/E)	-0.017 (0.003) **	-0.029 (0.003) **	0.283 (0.003) **	0.277 (0.003) **
log(FGI/sales)		0.036 (0.002) **		
log(RMI/CGS)				0.007 (0.001) **
N	110874	82764	108563	93667
Adj. R sq.	0.175	0.198	0.141	0.149

Table 4.Receivable and Payable Ratios: Agency Effect

Dependent variables are listed in the top row; explanatory variables are listed in the first column. Every regression includes year dummies and industry dummies. Sales-affiliates and purchase-affiliates are the fractions of sales and purchase to and from other chaebol affiliates. Voting right multiplier is the ratio of the percentage voting right to the percentage cash flow right of the controlling shareholder. See Table 2 notes for brief explanation of other variables. The sample includes chaebol member firms for the period between 2005 and 2008. Numbers inside the parenthesis are standard errors. Significance at 10% and 5% are indicated by * and **, respectively.

	log(receivable/sales)			log(payable/CGS)		
	(1)	(2)	(3)	(4)	(5)	(6)
log(sales-affiliates)	0.055		0.054			
	(0.012)		(0.013)			
	**		**			
log(purchase-affiliates)				0.030		0.027
				(0.014)		(0.014)
				**		*
log(voting right multiplier)		0.018	0.027		0.079	0.068
		(0.034)	(0.036)		(0.030)	(0.032)
					**	**
log(sales)	-0.062	-0.042	-0.064	0.007	0.024	0.001
	(0.014)	(0.014)	(0.015)	(0.014)	(0.013)	(0.014)
	**	**	**		*	
log(margin)	-0.019	-0.033	-0.022	0.058	0.072	0.056
	(0.026)	(0.025)	(0.026)	(0.025)	(0.023)	(0.025)
				**	**	**
log(D/E)	0.045	0.053	0.043	0.243	0.227	0.238
	(0.026)	(0.024)	(0.026)	(0.024)	(0.022)	(0.024)
	*	**	*	**	**	**
log(FGI/sales)	-0.025	-0.028	-0.024			
	(0.018)	(0.016)	(0.018)			
		*				
log(RMI/CGS)				0.007	0.000	0.007
				(0.006)	(0.005)	(0.006)
N	1568	1780	1564	1740	2017	1735
Adj. R sq.	0.352	0.354	0.351	0.299	0.303	0.301

Table 5. Transaction with Affiliates vs. Voting Right Multiplier

Dependent variables are listed in the top row; explanatory variables are listed in the first column. Every regression includes year dummies and industry dummies. Sales-affiliates and purchase-affiliates are the fractions of sales and purchase to and from other chaebol affiliates. Voting right multiplier is the ratio of the percentage voting right to the percentage cash flow right of the controlling shareholder. The sample includes chaebol member firms for the period between 2005 and 2008. Numbers inside the parenthesis are standard errors. Significance at 10% and 5% are indicated by * and **, respectively.

	log(sales-affiliates) (1)	log(purchase-affiliates) (2)
Constant	-2.677 (0.087) **	-2.674 (0.067) **
log(voting right multiplier)	0.213 (0.060) **	0.089 (0.047) *
N	2270	2248
Adj. R sq.	0.005	0.001

Table 6. Prepaid and Advance Revenue Ratios: Baseline Regressions

Dependent variables are listed in the top row; explanatory variables are listed in the first column. Every regression includes year dummies (7 of them, 2005 to 2011) and industry dummies (73 of them, based on KSIC9). See Table 2 notes for brief explanation of variables. All non-financial Korean firms which submitted annual statements to Korea Financial Supervisory Services between 2005 and 2011 are included. Numbers inside the parenthesis are standard errors. Significance at 10% and 5% are indicated by * and **, respectively.

	log(prepaid expense/CGS)		log(advance revenue/sales)	
	(1)	(2)	(3)	(4)
log(sales)	-0.086 (0.004) **	-0.080 (0.004) **	-0.162 (0.006) **	-0.136 (0.007) **
log(margin)	0.456 (0.005) **	0.466 (0.006) **	0.285 (0.008) **	0.294 (0.010) **
log(D/E)	0.013 (0.004) **	0.037 (0.004) **	0.146 (0.006) **	0.120 (0.008) **
log(FGI/sales)				0.030 (0.006) **
log(RMI/CGS)		0.017 (0.001) **		
N	116402	96847	89641	67538
Adj. R sq.	0.156	0.150	0.173	0.160

Table 7. Prepaid and Advance Revenue Ratios: Chaebol Effect

Dependent variables are listed in the top row; explanatory variables are listed in the first column. Every regression includes year dummies (7 of them, 2005 to 2011) and industry dummies (73 of them, based on KSIC9). Chaebol dummy is 1 if the firm is a member of chaebol at the given year, and 0 otherwise. Chaebol membership is according to Korea Fair Trade Commission. See Table 2 notes for brief explanation of other variables. All non-financial Korean firms which submitted annual statements to Korea Financial Supervisory Services between 2005 and 2011 are included. Numbers inside the parenthesis are standard errors. Significance at 10% and 5% are indicated by * and **, respectively.

	log(prepaid expense/CGS)		log(advance revenue/sales)	
	(1)	(2)	(3)	(4)
Chaebol dummy	0.183 (0.025) **	0.207 (0.027) **	0.411 (0.038) **	0.424 (0.045) **
log(sales)	-0.094 (0.004) **	-0.091 (0.004) **	-0.184 (0.006) **	-0.160 (0.007) **
log(margin)	0.455 (0.005) **	0.464 (0.006) **	0.282 (0.008) **	0.290 (0.010) **
log(D/E)	0.013 (0.004) **	0.037 (0.004) **	0.147 (0.006) **	0.120 (0.008) **
log(FGI/sales)				0.029 (0.006) **
log(RMI/CGS)		0.017 (0.001) **		
N	116402	96847	89641	67538
Adj. R sq.	0.156	0.150	0.174	0.161

Table 8. Prepaid and Advance Revenue Ratios: Agency Effect

Dependent variables are listed in the top row; explanatory variables are listed in the first column. Every regression includes year dummies and industry dummies. Sales-affiliates and purchase-affiliates are the fractions of sales and purchase to and from other chaebol affiliates. Voting right multiplier is the ratio of the percentage voting right to the percentage cash flow right of the controlling shareholder. See Table 2 notes for brief explanation of other variables. The sample includes chaebol member firms for the period between 2005 and 2008. Numbers inside the parenthesis are standard errors. Significance at 10% and 5% are indicated by * and **, respectively.

	log(prepaid expense/CGS)			log(advance revenue/sales)		
	(1)	(2)	(3)	(4)	(5)	(6)
log(sales-affiliates)				-0.001		-0.002
				(0.030)		(0.030)
log(purchase-affiliates)	-0.003		-0.006			
	(0.020)		(0.020)			
log(voting right multiplier)		0.145	0.108		0.011	-0.002
		(0.043)	(0.046)		(0.077)	(0.082)
		**	**			
log(sales)	0.033	0.033	0.023	0.243	0.227	0.243
	(0.020)	(0.018)	(0.020)	(0.034)	(0.032)	(0.035)
		*		**	**	**
log(margin)	0.621	0.575	0.616	0.257	0.264	0.257
	(0.035)	(0.033)	(0.035)	(0.060)	(0.056)	(0.060)
	**	**	**	**	**	**
log(D/E)	0.072	0.009	0.063	0.085	0.061	0.085
	(0.033)	(0.031)	(0.033)	(0.062)	(0.056)	(0.062)
	**		*			
log(FGI/sales)				0.015	0.013	0.015
				(0.041)	(0.037)	(0.042)
log(RMI/CGS)	0.007	0.009	0.007			
	(0.008)	(0.007)	(0.008)			
N	1805	2097	1801	1424	1583	1421
Adj. R sq.	0.390	0.361	0.392	0.289	0.271	0.286