

# Tunneling through Intragroup Transactions: Evidence from Korean Chaebols

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## Abstract

*This study examines the interaction between the ownership structure and the intragroup transactions of Korean chaebols to test the tunneling hypothesis. We derive two findings using the data on intragroup transactions (sales, purchases, receivables, and payables) and intragroup ownership between 1999 and 2014. First, the intragroup transactions of firms with large and/or direct ownership by the controlling family enhance the firms' performance significantly more than those of firms with small and/or indirect ownership. Second, firms' performance improves more if the counterparties of the intragroup transactions are firms with smaller and/or more indirect ownership by family and also with counterparty firms that are central to the group. The results are consistent with the tunneling hypothesis and suggest that intragroup transactions are important means of tunneling activities by controlling families.*

**Keywords:** *Intragroup transactions, Tunneling, family business groups, Ownership structure, Controlling family*

## 1. Introduction

Families control many firms worldwide. Controlling families typically exert significant power over their firms' cash flow rights, primarily through pyramidal or cross-holding ownership structures and dual-class shares.

The empirical literature has focused primarily on the relationship between the cash flow and voting rights of the controlling families and the performance and value of their firms [2][3][5][6][7][8]. Meanwhile, some studies use ownership as an endogenous variable and investigate firm profitability as a factor that affects ownership structure [4].

Although [1] set their selection hypothesis against the tunneling argument, their findings do not indicate that Tunneling does not happen in family business groups; therefore, they do not preclude a possibility that Tunneling may happen after determining the group firms' ownership structure to affect firm profitability. In addition, their tunneling tests only focus on transferring wealth from pyramid firms to those owned by controlling families. They do not examine comprehensive Tunneling that could occur within family business groups.

How do tunneling activities occur to increase the controlling family's wealth? If Tunneling occurs in family business groups, the main and direct channel must be intragroup transactions such as sales and purchasing goods and services. However, despite the considerable anecdotal

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evidence, little evidence is available regarding the transactions through which expropriation occurs.

This paper contributes to the literature on family business groups in several ways. First, it provides direct evidence for the tunneling hypothesis by showing that firms closely related to the controlling family gain more through intragroup transactions than other group firms. Second, this paper examines counterparties' characteristics to determine whether the recipients gain through any transaction channels. The results shed new light on the direct channels of tunneling through intragroup transactions. Third, the hypotheses are tested using comprehensive data on ownership and intragroup transactions that are not generally available in most countries. Finally, additional tests are performed to support the arguments, and detailed and clear explanations of the tunneling activities pursued by controlling families are provided.

## 2. Hypotheses

H1. Companies with a large share of family ownership gain from intragroup transactions, whereas companies with a small share lose from intragroup transactions.

H2. Companies with direct family ownership gain from intragroup transactions, whereas companies with indirect family ownership lose from intragroup transactions.

H3. Companies with large or direct family ownership gain from their transactions with companies with small or indirect family ownership.

H4. Large or direct family ownership companies gain from their transactions with central companies.

## 3. Regression models and variables

To investigate hypotheses 1 to 4, the following model is used to test whether the impact of intragroup transactions on firm performance differs according to the firm's ownership structure.

$$\begin{aligned}
 Profit = & \beta_0 + \beta_1 Transaction_{it} + \beta_2 Ownership_{it} + \beta_3 Ownership\ dum_{it} \\
 & * Transaction_{it} + \Phi Controls_{it-1} + PD + YD + ID + GD \\
 & + \varepsilon_{it} \qquad (1)
 \end{aligned}$$

Profit: Net income / Total assets

Transaction:

① Sales = Intragroup sales / Total sales

② Purchases = Intragroup purchases / Total purchases

③ Receivables = Intragroup receivables / Total receivables

④ Payables = Intragroup payables / Total payables

Ownership: ① Ultimate ownership ② Position

Ownership dum: ① Large ② Direct

Controls: Firm size & Leverage

PD (Public dummy), YD (Year dummies), ID (Industry dummies), GD (Group dummies)

$\varepsilon$ : Error term

## 4. Empirical results

Table 1 and 2 test for H. 1 and 2. The dependent variable is profitability, defined as net income divided by total assets. Sales are the intragroup sales / total sales, and Purchases are

intragroup purchases / total purchases (cost of sales + selling & administrative expense), Receivables are intragroup receivables / total receivables (accounted receivable + investment assets + other current or non-current receivables), and Payables is intragroup payables / total payables (total liabilities). Ownership variables are ultimate ownership, ultimate cash flow rights of the family, and position, the distance between the family and a firm in the group. Large indicates the firms whose ultimate ownership is more than 0.3, and directly indicates the firms whose position is less than 2. Firm size is the logarithm of the book value of total assets; Leverage is defined as total liabilities divided by assets, and public dummy is a variable that takes the value of one of the firms listed. T-statistics are in parenthesis.

Table 1. The results of empirical analysis on the effects of large or direct ownership (sales) on profitability

	Dependent variable: Profitability			
	(1)	(2)	(3)	(4)
Sales	-0.005 (-1.17)	-0.011** (-1.98)	-0.006 (-1.25)	-0.014*** (-2.65)
Purchases	-0.008 (-1.33)	-0.005 (-0.76)	-0.007 (-1.17)	-0.006 (-0.96)
Ultimate ownership	0.046*** (6.62)	0.040*** (4.96)		
Position			-0.012*** (-6.38)	-0.008*** (-3.87)
Large * Sale		0.015* (1.85)		
Large * Purchase		-0.006 (-0.51)		
Direct * Sale				0.029*** (3.36)
Direct * Purchase				0.001 (0.08)
Firm size	0.001 (1.00)	0.001 (0.92)	-0.000 (-0.31)	-0.000 (-0.30)
Leverage	-0.116*** (-21.28)	-0.116*** (-21.28)	-0.114*** (-20.96)	-0.114*** (-21.00)
Public dummy	-0.007 (-1.57)	-0.007 (-1.57)	-0.011*** (-2.59)	-0.011** (-2.52)
Constant	-0.011 (-0.35)	-0.007 (-0.22)	0.069** (2.06)	0.064* (1.91)
YD, ID, GD	Yes	Yes	Yes	Yes
Observations	6,748	6,748	6,748	6,748
F Value	15.55	15.22	15.51	15.29
Adj R-Sq	0.15	0.15	0.15	0.15

Table 2. The results of empirical analysis on the effects of ownership (purchases) on profitability

	Dependent variable: Profitability			
	(1)	(2)	(3)	(4)
Receivables	0.005 (1.37)	-0.002 (-0.52)	0.005 (1.39)	0.004 (0.89)
Payables	-0.013* (-1.89)	0.007 (0.083)	-0.013* (-1.90)	-0.012 (-1.53)
Ultimate ownership	0.034*** (4.42)	0.034*** (3.98)		
Position			-0.011*** (-5.44)	-0.010*** (-4.39)
Large * Receivables		0.024*** (3.27)		
Large * Payables		-0.005 (-0.43)		
Direct * Receivables				0.015* (1.68)
Direct * Payables				-0.005 (-0.34)
Firm size	0.001 (0.56)	0.000 (0.41)	-0.001 (-0.50)	-0.001 (-0.45)
Leverage	-0.130*** (-21.20)	-0.129*** (-21.05)	-0.129*** (-21.09)	-0.129*** (-21.04)
Public dummy	-0.010** (-2.15)	-0.009** (-2.02)	-0.013*** (-2.88)	-0.013** (-2.82)
Constant	0.046 (1.18)	0.047 (1.20)	0.117*** (2.06)	0.113*** (2.80)
YD, ID, GD	Yes	Yes	Yes	Yes
Observations	5,059	5,059	5,059	5,059
F Value	14.70	14.70	14.86	14.50
Adj R-Sq	0.17	0.18	0.17	0.17

Table 3 and 4 tests for H. 3 and 4 with intragroup sales. The dependent variable is profitability, defined as net income divided by total assets. Sales are the dependence on intragroup sales and measured by the intragroup sales / total sales, and purchases (Purs) are the dependence on intragroup purchases and measured by intragroup purchases / total purchases (cost of sales + selling & administrative expense). L is the set of counterparties with low ultimate ownership (UO<0.3), low position (POS<2), or low centrality (CEN=0). H is the set of counterparties with high ultimate ownership (UO>=0.3), high position (POS>=2), or high centrality (CEN>0). Ultimate ownership is the ultimate cash flow rights of the family, and position is the distance between the family and a firm in the group. OD (Ownership dummy) indicates the firms whose ultimate ownership is more than 0.3 or whose position is less than 2. Firm size is the logarithm of the book value of total assets. Leverage is defined as total liabilities divided by assets, and a public dummy is a variable that takes the value of one if the firm is listed. T-statistics are in parenthesis.

Table 3. The results of empirical analysis on the effects of ultimate ownership and position (sales) on profitability

	Dependent variable: Profitability							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Criteria for L/H		UO	POS	CEN		UO	POS	CEN
Ownership dummy(OD)	Large ownership dummy				Direct ownership dummy			
Sales	-0.010* (-1.92)				-0.014*** (-2.63)			
Sales to L		-0.013** (-2.29)	-0.004 (-0.63)	-0.026 (-1.56)		-0.015** (-2.52)	-0.005 (-0.80)	-0.047*** (-3.64)
Sales to H		0.024 (1.47)	-0.016** (-2.22)	-0.008 (-1.41)		-0.008 (-0.78)	-0.022*** (-3.08)	-0.007 (-1.31)
Ultimate ownership	0.038*** (4.94)	0.037*** (4.74)	0.039*** (4.99)	0.039*** (4.99)				
Position					-0.008*** (-4.01)	-0.009*** (-4.12)	-0.008*** (-3.63)	-0.009*** (-4.33)
OD * Sales	0.015* (1.77)				0.028*** (3.34)			
OD * Sales to L		0.032*** (2.75)	0.014 (1.28)	-0.011 (-0.50)		0.027** (2.50)	0.013 (1.22)	0.054** (2.28)
OD * Sales to H		-0.030* (-1.69)	0.020* (1.78)	0.022** (2.34)		0.021 (1.50)	0.050*** (3.38)	0.021** (2.11)
Firm size	0.001 (0.87)	0.001 (0.89)	0.001 (0.89)	0.001 (0.88)	-0.001 (-0.34)	-0.000 (-0.34)	-0.001 (-0.32)	-0.000 (-0.27)
Leverage	-0.116*** (-21.43)	-0.117*** (-21.52)	-0.116*** (-21.37)	-0.116*** (-21.33)	-0.115*** (-21.14)	-0.115*** (-21.12)	-0.115*** (-21.18)	-0.115*** (-21.14)
Public dummy	-0.007 (-1.60)	-0.007 (-1.63)	-0.007 (-1.60)	-0.007 (-1.54)	-0.011** (-2.54)	-0.011*** (-2.56)	-0.011** (-2.45)	-0.011*** (-2.58)
Constant	-0.006 (-0.18)	-0.003 (-0.09)	-0.006 (-0.18)	-0.004 (-0.11)	0.065* (1.95)	0.065* (1.95)	0.063* (1.89)	0.067** (2.00)
YD, ID, GD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,732	6,732	6,732	6,732	6,732	6,732	6,732	6,732
F Value	15.74	15.47	15.39	15.48	15.82	15.41	15.48	15.53
Adj R-Sq	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15

Table 4. The results of empirical analysis on the effects of ultimate ownership and position (purchases) on profitability

	Dependent variable: Profitability							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Criteria for L/H		UO	POS	CEN		UO	POS	CEN
Ownership dummy (OD)	Large ownership dummy				Direct ownership dummy			
Purchases	-0.006 (-0.91)				-0.008 (-1.21)			
Purs from L		-0.002 (-0.26)	-0.011 (-1.16)	-0.018 (-0.87)		-0.001*** (-0.06)	-0.010 (-1.12)	-0.036* (-1.81)
Purs from H		-0.019 (-1.12)	0.002 (0.24)	-0.003 (-0.42)		-0.024* (-1.91)	-0.003 (-0.26)	-0.003 (-0.43)
Ultimate ownership	0.045*** (6.25)	0.044*** (6.21)	0.045*** (6.35)	0.046*** (6.41)				
Position					-0.011*** (-5.81)	-0.011*** (-5.86)	-0.012*** (-5.89)	-0.011*** (-5.86)
OD * Purchases	-0.004 (-0.33)				0.005 (0.39)			
OD *Purs from L		0.015 (0.89)	0.011 (0.71)	-0.043 (-1.47)		0.006 (0.39)	0.003 (0.16)	-0.007 (-0.25)
OD *Purs from H		-0.006 (-0.28)	-0.025 (-1.54)	0.006 (0.46)		0.009 (0.49)	0.002 (0.12)	0.013 (0.93)
Firm size	0.001 (1.23)	0.001 (1.17)	0.001 (1.24)	0.001 (1.31)	-0.000 (-0.08)	-0.000 (-0.15)	-0.000 (-0.09)	-0.000 (-0.01)
Leverage	-0.116*** (-21.41)	-0.116*** (-21.43)	-0.116*** (-21.39)	-0.116*** (-21.37)	-0.115*** (-21.12)	-0.115*** (-21.12)	-0.115*** (-21.12)	-0.115*** (-21.11)
Public dummy	-0.007 (-1.55)	-0.006 (-1.49)	-0.006 (-1.50)	-0.006 (-1.50)	-0.011*** (-2.56)	-0.011** (-2.50)	-0.011*** (-2.56)	-0.011** (-2.54)
Constant	-0.016 (-0.50)	-0.013 (-0.42)	-0.017 (-0.53)	-0.017 (-0.54)	0.062* (1.89)	0.065** (1.98)	0.063* (1.91)	0.061* (1.87)
YD, ID, GD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,732	6,732	6,732	6,732	6,732	6,732	6,732	6,732
F Value	15.70	15.38	15.35	15.43	15.66	15.32	15.28	15.37
Adj R-Sq	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15

## 5. Conclusion

This paper has attempted to determine whether intragroup transactions control family wealth and whether the transactions among affiliated firms in large family business groups affect firm performance.

First, intragroup transactions' impacts on firm profitability differ according to the firm's ownership structure (ultimate ownership and position), measured with the ownership data of all group firms, including unlisted firms. The test results show that the transactions of firms with large or direct family ownership improve their performance, while the other affiliated firms' intragroup transactions worsen their performance. Eventually, they indicate that Tunneling could happen in family business groups through intragroup transactions.

However, it is not obvious that the family-owned firms gain from transactions with the affiliated firms that lose from them. Therefore, this paper investigates which affiliates the firms gain from the intragroup transactions. This analysis divides transaction counterparties into two groups using three variables: ultimate ownership, position, and centrality. We discover that firms with large or direct family ownership benefit from intragroup transactions with firms with low ultimate ownership, high position, or high centrality. These results support the prior studies showing that the wealth of firms in which controlling families has less ownership is transferred to firms in which the family has more. Further, the results show that central firms are also used for Tunneling. This paper also performs the tests on valuation using publicly listed firms and finds that the family-owned listed firms have a higher valuation when they have transactions with the firms where controlling families have low cash flow rights.

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