Dumping Waste in Your Neighbor's Backyard:

Tunneling Investigation with Enhanced Identification Strategy

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August, 2015

ABSTRACT

This paper examines a sample of 635 real estate transactions among Korean listed firms, their related companies and controlling shareholders from 1999 to 2014. Investigating changes in market value after the transactions enables to identify whether each transaction is value enhancing or not. I find that the firms, expecting a drop in value, acquire real estate properties from controlling shareholders and dispose them expected otherwise. When firms either buy (sell) or lease a property from (to) controlling shareholders, the market value of the acquired (the disposed) property drops (increases) while the value of the leased rises. All of the findings confirm a tunneling aspect of listed firms' real estate transactions with controlling shareholders. Market does not seem to differentiate good deals from expropriation.

Keywords: Tunneling; Real Estate; Related Party Transaction; International Corporate Governance

JEL classification: G34; G15; R52

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1. Introduction

Tunneling is the transfer of resources out of a company to its controlling shareholder (López de Silanes, Florencio, et al 2000). Therefore, to show that a certain transaction type falls under the tunneling, it is essential to demonstrate that the controlling shareholder, as an individual, should benefit from the transaction.

Existing literatures try to uncover the tunneling nature of a certain transaction mostly in two ways. First, some papers infer the tunneling by showing negative market reaction to the announcements of prospective tunneling transactions.[1] Alternatively, the other stream of literatures presents specific types of transactions where transaction price is favorably set for related parties, compared to any arm's length transactions (see Cheung, Yan-Leung, et al. 2009).

Both empirical strategies need somehow strong underlying assumptions. To link negative market reaction to the tunneling requires assumption where stock market can differentiate deals beneficial to a firm from those which are not. Existing literatures report instantaneous negative market reaction to prospective tunneling transactions. Unfortunately, the immediate unfavorable market reaction does not guarantee the long-term value destruction of the firm conducting the transactions. Simply put, it is still probable that a deal regarded as hazardous one at the initial announcement can turn into a value-creating transaction in the long run.

Empirical studies focusing on the price conditions of a certain transaction type often compare the price condition of related party transactions with the conditions in similar arm's length deals. The rationale from which the tunneling is inferred is that firms pay more for acquisition from related parties while receiving less for disposition than in arm's length transactions. The rationale assumes that the rate of return from the assets transferred should

[1] Cheung, Yan-Leung, P. Raghavendra Rau, and Aris Stouraitis(2006) and Cheung, Yan-Leung, et al.(2009) among others.

be identical, or similar, between a buyer and a seller in the transactions. Skeptics may argue that underpaid asset dispositions are not value destructive, if the selling party simply does not make the most out of it. In other words, the disposed asset can generate decent return on investment under related parties' new business environment, but the asset does not do so under current asset holder. In that case, the prospective tunneling asset transaction seems to efficiently reallocate corporate assets within a business group. Likewise, overpaid asset acquisition is justified the same way that the acquired asset can be better utilized and, therefore, can yield a higher rate of return under the control of an acquiring firm.

The main reason the tunneling argument in the existing literatures becomes vulnerable to the counter argument presented above is that we cannot precisely measure *ex post* value of the assets transferred or deals executed. The value finding is tricky, as the *ex post* value of assets are contaminated by various confounding events after prospective tunneling transactions. More specifically, it is virtually impossible to carve out exact *ex post* unit price changes, the price changes that are independent of subsequent events influencing the asset value.

In this paper, I study real estate transactions between Korean listed firms and their controlling shareholders, finding systemic evidence that real estate properties acquired from controlling shareholders drops in values after transactions, while the properties disposed to the shareholders show significant capital gains[2]. There are two advantages of my study that mitigate the caveats of prior tunneling literatures.

First, the investigation of real estate price changes makes it possible to isolate price changes of assets transferred initiated by the events of our interest without taking other corporate activities into account. Price changes of other asset types are either not publicly

[2] Nominal value of real estate properties seldom goes down, showing upward trend over time. Drop in real estate values here should be interpreted as the price of a real estate property does not keep up with general market upward trend.

traceable or severely affected by other corporate events after transactions, raising doubt that the price changes might not be solely driven by the transactions. For example, suppose that a firm acquires a subsidiary company from a related party. Even if the fair value of the company is traceable, it is unclear that the acquisition is a sole driver to bring the value change. In summary, we don't know whether the changed value is solely driven by the acquisition transaction or the value changes come from other corporate behavior after the acquisition. In contrast, real estate price changes are not blended with other corporate events and per unit price (per square meter) is publicly traceable in Korea. Therefore, it becomes more believable that the price changes are driven by the transactions investigated, under a condition that likely tunneling evidences are found.

Second, the transactions of my interest here are those between listed firms and *individual* controlling shareholders. Past literatures infer the tunneling from transactions with related *firms*. That approach is still insufficient to precisely label the transactions as the tunneling unless it is explicitly shown that all (or at least majority) of cash flow rights from the related firms directly goes to controlling shareholders at individual level. Profit and loss from real estate transactions studied in my study directly belongs to individual controlling shareholders, not indirectly via related firms. Therefore, if any consistent evidence of favorable pricing toward controlling shareholders is found in real estate transactions, the evidence apparently supports the tunneling aspect without further explanation which should have been necessary in the study of transactions against related firms.

As noted earlier, studies finding systemic favorable pricing of assets transfer to related parties are not free from a counter-argument that assets disposed at bargain price to related parties are not efficiently operating due to the lack of necessary support and can be better utilized after being transferred to more capable related parties. If the argument holds, favorable pricing for the related parties is not assumed to be tunneling practice but efficient

asset reallocation. To nullify this counter-argument, we need somehow stronger assumption that return on assets transferred is identical between acquirer and disposer. In contrast, my study on transactions with *individual* controlling shareholders only needs weaker assumption that corporate entities are better capable than individuals in utilizing given real estate properties. This assumption is looser and easier to accept, considering that corporate entity is generally bigger in size and more resourceful than individuals. Under the assumption and along with the presence of systemic evidence for favorable pricing for controlling shareholders, the counter-argument advocating the efficient asset allocation within a business group becomes no longer valid.

The contribution of this paper is threefold. First, tracing the changes in real estate values enables to isolate price changes unaffected by confounding corporate events and to test the impact of a transaction specifically confined to the value of the assets. My study shows *confounding event free ex pos*t value changes of asset transfer which becomes the most direct evidence to test the tunneling aspect of certain transactions. Second, the singling out *ex post* price changes unaffected by other corporate activities makes it possible to test whether stock market properly differentiates a value-adding transaction from a destructive one in the long run. In contrast to past literatures studying immediate market reaction to *likely* tunneling transactions without knowledge of whether the transactions actually do harm to a firm in the long run, *ex post* price changes not contaminated from other corporate events can tell whether stock market properly punishes value-destructive deals. Lastly, this paper adds an additional dimension to corporate governance literature by studying the effectiveness of a supplementary board monitoring system. Korean listed firms are required to allow a designated officer to monitor board meetings. The main responsibility of the officer is to check whether board members properly execute their duties to protect shareholders' rights. As Korean listed firms are required to report whether the officer attends the board meeting where

each real estate transaction above certain magnitude is approved, it is testable how stock market evaluates the attendance of the officer in the board meeting, in the presence of potential agency problem risk that board members approve deals hurting general shareholder value in favor of controlling shareholders. I find no systemic evidence that stock market reacts more favorably to real estate transaction decisions where the special officer attends. In the presence of empirical evidence confirming the tunneling nature of real estate transactions, it is also questioned whether the designated officers play active roles in protecting rights of minority shareholders during a board's decision on the transaction. I find that the officers are either excluded during the board's decision or merely passive in voicing against value-destructive corporate decisions. This finding shows that an additional institutional instrument implemented to reinforce monitoring system does not function as originally intended, even when a malpractice makes him (her) worry about him (her) own job security and exposed to potential litigation risk.

2. Literature Review

Conventional framework explaining the tunneling points out private benefit of control (Zingales 1994). Unlike firms in US and UK where corporate ownership is widely spread, most of the companies outside the region are practically controlled by a few dominant individuals[3]. Once practically seizing entire control over a firm, controlling shareholders can either help other firms under their control (propping) or pursue personal interest at the expense of minority shareholders (expropriation). Literatures categorize the tunneling as one aspect of minority shareholder expropriation. In detail, one stream of past literatures studying expropriation focuses on a few transaction types such as rescue-mergers, equity offering, or

[3] La Porta et al.(1998, 1999, 2000b) are classics covering international corporate ownership.

intercorporate loan program[4]. The literatures show the tunneling mechanism by empirically showing that the transaction types increase controlling shareholders' wealth while destructing the values of minority shareholders.

More recent tunneling literatures pay attention to related party transactions and subsequent negative market reaction to the transactions. Cheung et al. (2006, 2009a) first report negative market reaction responding to the announcements of related party transactions in Hong Kong and Chinese stock market, respectively. But, Cheung et al. (2006) is limited in a sense that they report overall negative market reaction to seemingly likely tunneling transactions and do not present direct evidence to show that the transactions actually reduce the wealth of minority shareholders while boosting that of controlling shareholders. Tackling the limitation, Cheung et al. (2009b) successfully find a specific tunneling mechanism by showing that the price paid to related parties for asset acquisition is excessive compared to similar arm's length transactions and that the price received from the parties for asset disposal is more unfavorable than arm's length transactions. But, Cheung et al. (2009b) is still vulnerable to a possible criticism that assets disposed at deep discount can be best utilized at acquiring firms with better resource supports from a new owner. If this scenario holds, then seemingly value-destructive transaction is rather a way of efficient asset reallocation among firms, nullifying the tunneling argument. My study intend to provide a remedy to this weakness which scholars skeptical about tunneling may pick on, by presenting tunneling evidence of real estate transactions which is relatively immune to the counter-argument above.

3. Empirical Evidence

[4] Bae, L., Kang, J., and D. Kim(2002), Baek, J., Kang, J., and I. Lee(2006), Baek, J., Kang, J., Jiang, and K. Park (2004), Guohua, Charles MC Lee, and Heng Yue(2010), Berkman et al. (2009), and Buysschaert et al. (2004) among many others.

3.1. Data

Every year, Korean local governments post the appraisal value of all the real estate properties enrolled in the national real estate registry database. The appraisal value information has been available since 1990 on the websites provided by the governments. The local governments post the information to make it publicly available, as the appraisal value is used as property tax base. In most cases, tax base property value is set lower[5] than actual market price upon which actual real estate transactions occur but is well in line with the price year over year. Also, the data is released with a unit price per m^2 and, therefore, enables apple-to-apple comparison among properties in different regions.

On the other hand, all of the firms listed in either the Korean Stock Exchange ("KSE") or the Korea Securities Dealers Automated Quotations ("KOSDAQ") are required to announce real estate transactions both with controlling shareholders and with affiliated firms onto Data Analysis, Retrieval and Transfer (DART) System, a public financial data warehouse. The disclosures contain information about total transaction amount, physical address of the real estate property traded, counterparty name either of controlling shareholder or of affiliated firm, date of transaction closing, date of board approval, whether a special officer designated to monitor board meetings on behalf of general stakeholders attends the board approval meeting.

I manually search DART for all of Korean listed firms' real estate transactions with affiliated firms or individuals, ending up with 635 such transactions from January 1999 to April 2015. At last, I investigate the physical addresses of the real estate properties traded between listed firms and their related parties from local governments' website, and trace the annual changes in the appraisal value of the properties from 1990 to 2014. By doing so, I

[5] The value is formed at around 70~80% of actual market price.

come to know whether the appraisal value goes up or down after each transaction. I regard the appraisal value after the transactions as *ex post* asset value for the real estate properties traded between related parties. By combining the real estate transaction data with time-series appraisal value changes information, I identify how the value of real estate properties changing hands moves upon each transaction and see whether each transaction is executed either for the benefit of firm or in favor of a counterparty in the long run. As the counterparty in each transaction is also identified, appraisal value changes are traceable around transaction year, depending on whether the counterparty should be an affiliated *firm* or *individual* controlling shareholders.

3.2. Empirical Findings

It is only reasonable to suspect a possible tunneling attempt when three conditions below are satisfied. Each of the three projections is tested and the test results are presented from Table II to Table V.

1. Properties disposed to controlling shareholders systemically and significantly increase more in value than those acquired from the shareholders, with additional evidences that property values traded between listed firms and their affiliated companies are not statistically different in case that the property is either disposed to or acquired from the affiliated companies.
2. Properties leased from controlling shareholders show greater capital gain than those leased to the shareholders.
3. If there exist firms which sell(buy) properties to(from) both affiliated firms and controlling shareholders throughout the sample period, 1999 to 2015, the properties disposed(acquired) to(from) the controlling shareholders increase

more(less) in value than the properties disposed(acquired) to(from) the affiliated.

Projection 1 and 3 are self explanatory and projection 2 can be understood in a way that controlling shareholders holding properties expected to rise in value will not surrender possession and will lease to firms under their control in case that the properties need to be used for business operation within the firm. The same reason makes the controlling shareholders to refuse taking over and to consider leasing real estate properties expected to realize insignificant capital gain when the shareholders need the properties for their personal business.

[Insert Table I Here]

Table I presents summary statistics of variables discussed in this paper. “Price Change Around Related Party Transactions” is the difference between average price changes before and after each real estate transaction with related parties. The price change shows overall upward trend, which seems to be normal, considering economic and subsequent monetary expansions. For this reason, I use the term “value losing” not for properties of which prices decrease in absolute value but for properties that do not increase in value as much as others in my sample.

[Insert Table II Here]

Table II shows the results of testing the first projection proposed in the early part of this section. Specifically, this table shows whether listed firms purchase (transfer) real estate properties likely to fall (rise) in value from (to) their controlling shareholders, while there exists no systemic difference in price changes when the properties change hands with

affiliated firms, not with individuals having controlling shares. Appraisal values increase more upon real estate transactions for properties transferred to controlling shareholders than for those gone to affiliated firms, and the difference in the increase is statistically significant at 5% level. In contrast, test results showing whether changes in property values upon transactions with related firms are either mixed(see first parts of Panel A and Panel B in Table II) or statistically insignificant(see the outright column in Table II). In summary, Table II shows that listed firms would have taken greater capital gains from real estate transactions if the firms had kept properties they actually sold and if the firms had sold properties they actually kept. As a consequence of those transactions, controlling shareholders enjoy capital gains from real estate transactions with the firms under their control, by purchasing properties whose appraisal value is enhanced more than the properties that the shareholders pass down to the firms. It is noteworthy that controlling shareholders consistently benefit as individuals while affiliated firms have mixed trading results with minimal statistical significance.

[Insert Table III Here]

In Table III, I narrow down samples only to the firms which execute both of disposal and acquisition with both of controlling shareholders and related firms. While Table II compares property sales with purchases contracts as a pool, Table III compares transactions occurred within same firms. Only a handful of firms carry out both of acquisition and disposition, leaving six firms remaining in the sub-sample. In detail, I select firms selling properties both to controlling shareholders and to affiliated firms (two cases). Likewise, four companies acquire real estate both from controlling shareholders and from related companies. As seen in Panel B, for all four cases, properties that controlling shareholders dispose to the firms under their control increase less in value, compared to the properties that the firms acquire from

related firms. This phenomenon is found without exception for all four cases.[6]

[Insert Table IV Here]

Table IV reports additional evidences supporting a possibility that listed firms trade real estate properties out of the tunneling motivation. If real estate transactions fit tunneling characteristics, properties sold to controlling shareholders should rise more in value, relative to the properties bought from the shareholders. In the same context, if controlling shareholders execute real estate transactions for expropriation purpose, the properties leased from controlling shareholders are expected to show higher price increase, while properties leased to the shareholders shall experience less (or no) unrealized capital gain. Controlling shareholders would not let their properties go to public firms' hands if they expect additional potential for price increase from the properties that they possess. The controlling shareholders may rather lease out the properties for firms' use, if the firms are in dire need for the properties. By the same token, the shareholders may lease real estate properties for personal use, not purchase them, from the firms under their control, if the shareholders are well aware that the properties do not have potential for further price increase. Results in table IV confirm the scenarios consistent with the tunneling motivation.

To empirically test this possible inference, I manually search real estate lease contracts among Korean listed firms, their affiliated firms, and controlling shareholders, ending up with 386 contracts. I find that the listed firms and their affiliated firms lease back and forth their office buildings or factory sites often. That behavior can be interpreted as that firms under same business group umbrella try to best utilize tangible assets by sharing them and to reallocate corporate resource to maximize returns from the assets.

[6] I leave the results found in Panel A not discussed, as there exist only two cases.

The lease contracts of my special interest are those between listed firms and their controlling shareholders. I investigate price changes of properties that are leased directly from or to controlling shareholders to test the implication explained above. In other words, controlling shareholders possessing properties expected to rise in value will not surrender the properties when the properties should be used for the benefit of firms under their control. The shareholders will rather choose to lease the properties to the firms. For the same reason, the controlling shareholders will refuse to acquire properties when they expect minimal capital gains from the acquisition. The shareholders will rather choose to lease the properties if they need them for any personal usage. Table IV shows the price of real estate properties leased from controlling shareholders, on average, rises more than those leased to the shareholders. In detail, the properties leased from controlling shareholders show on average 149% price increase after the lease contract, while the properties leased to controlling shareholders only increase by 127%. Although deviations among observations admittedly hinders us from drawing stronger implication from the lease contracts, the average differences of price changes around lease contracts enables to see how real estate properties are managed among related parties.

[Insert Table V Here]

In Table V, I try to find what factors drive listed firms to trade real estate properties either with related firms or directly with controlling shareholders. I run Probit regressions with a dependent variable equal to one if a firm acquires real estate properties, while the variable is equal to zero if a firm disposes properties to them, in a given year. The key variable of my interest is the “Real Estate Price Change.” As we know how real estate unit price has changed after each transaction as of now (the price changes are not yet revealed at the point of

transaction), the Probit regression in Table V allows us to see whether the direction of transactions (buy or sell) are correlated with *ex post* price changes of properties traded.

Specifically, by splitting samples into two groups based upon whether a counterparty of each transaction is a controlling shareholder or an affiliated firm, I investigate whether corporate characteristics likely to trigger real estate transactions are different between the two groups. Table V shows that property acquisition from controlling shareholders are negatively related to price increase after the transaction, while disposals are positively related. In contrast, real estate acquisitions from affiliated firms are rarely related to subsequent price changes but is positively linked to higher operation margin and lower level of debt ratio of the acquiring firms. This finding implies that firms having better cash cushions tend to buy properties from their affiliated firms, with less care about *ex post* price change. With this clear difference in the factors triggering real estate transactions, depending on whether counterparty is a controlling shareholder or a related firm, it seems to reasonable to believe that public firms dispose real estate with a direction that benefits their controlling shareholders, at the cost of opportunities for potential capital gains from real estate holdings and that the firms acquire properties in a way of protecting the controlling shareholders from potential capital loss which the shareholders would have taken if they had not sold it to the firms under their control. In a stark contrast, listed firms do not seem to trade real estate properties with their affiliated companies with any directional expectation for consequential price changes of the properties. The listed firms tend to acquire properties when the firms are more profitable (show higher operating margins) and have more room for additional financing capability (showing lower debt ratio).

[Insert Table VI Here]

Table VI presents stock market reactions upon the announcements of real estate transactions with related entities. Panel A and Panel B show overall negative market reaction to the announcements, which is consistent with what previous literatures mostly find (see Cheung et al. 2006, 2009). Additionally, Panel C in Table VI shows where most of the negative market reactions come from. Stock market seems to react most negatively to property acquisitions from controlling shareholders, compared to disposals to the shareholders.

[Insert Table VII Here]

The contribution of this paper with respect to the stock market reaction study of related party transaction mainly comes from that with the knowledge of *ex post* property price changes, it becomes testable whether stock market can differentiate deals beneficial to a firm in the long run from deals hurting firm value. If stock market properly evaluates if a certain property transaction is value destructive, stock market reaction to the "good deals" should be more favorable than to the deals benefiting controlling shareholders at the expense of minority shareholders.

To see whether stock market properly differentiate "good deals" from "bad deals", I split real estate transactions signed with controlling shareholders into five groups in the order of *ex post* price changes. In case that a listed firm disposes (acquires) properties to (from) the controlling shareholders, transactions involving properties of which price increases the most (the least) after the transaction are classified as "the most likely tunneling disposal (acquisition)" in Table VII. Likewise, disposal (acquisition) involving the properties of which prices increase the least (the most) are classified as "the least likely tunneling disposal (acquisition)" in the same table. Observing the difference in stock market reaction, I test

whether market properly penalizes “bad deals” and appraises “less harmful deals”. Panel B shows that stock market reaction is less favorable toward bad deals with marginal statistical significance. It is unclear whether the market differentiates bad disposals, due to limited number of sample cases.[7]

Combing this finding in Table VI with that of Table VII, I conclude that stock market reaction does not tell whether a deal benefits listed firms or not in the long run, but the market, in general, responses negatively to the acquisitions where firms pay cash for real estate properties bearing great uncertainty about whether the properties help firm value enhanced.

[Insert Table VIII Here]

The last contribution of this paper for corporate governance literatures is to investigate whether institutions in place intended to prevent potential agency problems are well functioning. Korean listed firms are required to appoint an officer designated to attend board meetings to monitor board of directors during the meeting and, therefore, to check whether the directors properly advocate the interest of general shareholders. [8] Table VIII shows the difference in stock market reaction to real estate transactions with related parties, depending upon whether internal auditor attends board meetings where the transactions are approved by board members. Market reaction is not significantly different, depending on the presence of the officer in board meetings. This finding supports that stock market does not appreciate additional institutional mechanism to prevent potential agency problem incurred by board members.

[7] To overcome this limited sample problem, I compare top 30/40/50 percentile with bottom 30/40/50 percentile, only ending up with similar results.

[8] This role is one of the many responsibilities for the officer. The attendance of every board meetings is recommended but not compulsory.

4. Conclusion

While many preceding works investigate the tunneling nature of related party transactions, this paper try to present a clearer way of identifying whether related party transactions are indeed motivated by the tunneling purpose. The main contribution of this paper within the literatures of the same kind is to find a specific transaction type relatively free from confounding corporate events, the events that make it difficult to judge whether each transaction hurts firm value in the long run and to subsequently test whether the transaction type fits in tunneling motivation. By doing so, I try to present not circumstantial but direct evidence proving the existence of tunneling transactions between listed firms and their controlling shareholders.

On top of that, with the knowledge of ex post property value changes, I improve the quality of investigation testing whether stock market adequately differentiates good deals from bad ones. Until now, papers dealing with this issue can only study immediate market reaction to the announcements of transactions with the affiliated. Therefore, existing studies do not tell whether the market reaction correctly provides information about whether or not the transactions are beneficial to firms in the long run. This paper comes to test whether the stock market properly evaluates long term effect of each related party transaction, with the help of data on posterior price changes. Stock market generally seems to dislike transactions with related parties but does not precisely tell whether each transaction adds value to firms or not, in the long run.

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Table I

This table shows the distribution of real estate transactions of Korean listed firms either with their controlling shareholders or with affiliated firms from January 1999 to April 2015. In panel B, publicly notified individual land price refers to unit land price annually posted by Korean local governments to be used as property tax base. In panel C, profits from real estate transactions with related party report actual price traded minus book value of the property traded, recognized by the firms. Some firms do not report the profits, leaving only 83 cases in this study for the information. N, SD, Min, and Max stand for number of observations, standard deviation, minimum value, and maximum value, respectively.

Panel A: Real Estate Transaction Frequency Summary	**N**	**%**			
Total Transaction	635	100.0%			
Purchase from Related Parties	378	59.5%			
Purchase from Related Individuals	111	17.5%			
Purchase from Related Firms	267	42.0%			
Sales to Related Parties	252	39.7%			
Sales to Related Individuals	38	6.0%			
Sales to Related Firms	214	33.7%			
Panel B: Publicly notified individual land price	**N**	**Mean**	**SD**	**Min**	**Max**
Price Change Around Related Party Transactions	454	165.2%	255.6%	-78.5%	3263.6%
Price Changes betwen1999 and 2011	395	226.1%	578.6%	-88.8%	9834.2%
Panel C: Transaction Details (in million KRW)	**N**	**Mean**	**SD**	**Min**	**Max**
Transaction Volume	623	17,829	42,350	0.19	505,000
Profits From Real Estate Transactions with Related Party	83	10,718	35,942	- 2,092	291,000

Table II

This table presents average unit price changes before and after the real estate properties of Korean listed firms change hands to either affiliated firms or controlling shareholders. Transaction Type "Sell to" refers to a transaction where a sample listed firm disposes properties, while "Buy from" means a transaction where the firm acquires the properties. "Mean" presents the average difference between 5 year average unit price changes BEFORE the properties change hands and AFTER the transactions occur. SD, Min, and Max are used in the same manner as in Table I. "Difference" shows whether the "Mean" is statistically same between two different counterparties (affiliated firms and related individuals). Panel A shows results after eliminating values outside lowest and highest 10%. Panel B. shows the results with deleting values beyond two standard deviations. "t-stat" presents t-value testing whether "Difference" is statistically significant.

Panel A: Average Price Change Before/After Real Estate Transactions With Related Parties (Truncated at 10%)								
Transaction Type	Counterparty	N	Mean	SD	Min	Max	Difference	t-stat
Sell to	Affiliated Firms	113	106.8%	64.4%	15.8%	255.1%	4.5%	0.58
Buy from		146	102.3%	57.3%	15.8%	259.5%		
Sell to	Related Individuals	26	172.5%	89.8%	51.8%	431.7%	40.4%	2.02
Buy from		66	132.1%	77.2%	40.4%	414.5%		
Panel B: Average Price Change Before/After Real Estate Transactions With Related Parties(Truncated Beyond 2-sigma)								
Transaction Type	Counterparty	N	Mean	SD	Min	Max	Difference	t-stat
Sell to	Affiliated Firms	135	107.1%	84.9%	-78.5%	344.5%	-15.5%	-1.49
Buy from		189	122.6%	102.1%	-23.7%	477.9%		
Sell to	Related Individuals	27	166.8%	92.8%	19.5%	431.7%	46.0%	2.22
Buy from		77	120.8%	91.5%	-11.5%	465.3%		

Table III

This table shows how the unit price of real estate properties changes after Korean listed firms trade the properties either with affiliated firms or with controlling shareholders. In Panel A, samples are confined to firms which dispose the properties both to their controlling shareholders and to affiliated firms. Likewise, sample firms in Panel B are those that acquire real estate assets both from controlling shareholders and from their affiliated firms. "avg_ind" refers to the difference between five-year average unit prices before and after real estate properties change hands with controlling shareholders. "avg_corp" is the difference between five-year average unit prices before and after real estate properties change hands with affiliated firms. "Difference" is the gap between "avg_ind" and "avg_corp". "t-stat" presents t-value testing whether "Difference" is statistically significant. "Pr> |t|" shows probability that the "Difference" equals zero. As there are only two firms which dispose real estate properties both to controlling shareholders and to affiliated firms, "t-stat" is not reported in Panel A.

Panel A: Firms Executing Real Estate Disposal Both with Controlling Shareholders and Related Firms							
Firm	N(individual)	N(Firm)	avg_ind(X)	avg_corp(Y)	Difference(Y-X)		
A	2	2	19.49%	114.26%	94.77%		
B	2	3	169.89%	148.38%	-21.52%		
Panel B: Firms Executing Real Estate Acquisition Both with Controlling Shareholders and Related Firms							
Firm	N(individual)	N(Firm)	avg_ind(X)	avg_corp(Y)	Difference(Y-X)	t-stat	Pr > |t|
C	2	2	66.62%	78.51%	11.89%	4.44	0.02
D	1	5	79.22%	105.49%	26.27%		
E	3	2	174.67%	184.43%	9.76%		
F	3	1	75.36%	92.89%	17.52%		

Table IV

This table displays unit price changes of real estate properties before and after Korean listed firms either trade or lease the properties with their controlling shareholders. Five year average prices are measured before and after the trades or lease contracts. Price changes are the difference between the average prices before and after the trades or contracts. Panel A reports the prices changes when the ownership of the properties has changed, while Panel B shows the price changes when the properties are leased to or from the controlling shareholders. N, SD, Min, and Max stand for number of observations, standard deviation, minimum value, and maximum value, respectively.

Panel A: Average Annual Price Changes before and after Real Estate Transactions					
Counterparty: Controlling Shareholder	N	Mean	SD	Min	Max
Disposal to	30	269.8%	361.6%	19.5%	1784.9%
Acquisition from	87	199.2%	299.4%	-33.6%	1837.7%
Panel B: Average Annual Price Changes before and after Real Estate Lease Contracts					
Counterparty: Controlling Shareholder	N	Mean	SD	Min	Max
Lease from	275	149.8%	172.5%	-32.0%	1871.6%
Lease to	11	127.4%	123.2%	4.4%	355.6%

Table V

This table reports the results of Probit regressions. For each column, dependent variable equals one if a sample firm acquires real estate properties from either controlling shareholders or affiliated firms in a given year and is set to zero if the sample firm disposes the properties. "Real Estate Price Change" refers to the difference between five year (for Panel A) or one year (for Panel B) average unit price before and after each transaction occurs. "Capex-to-FCF" is the ratio between total capital expenditure and free cash flow. "ln(Asset)" means the logged value of total asset. "OP Margin" stands for operating profit divided by total sales. "Pr > ChiSq" is the probability that a given coefficient is equal to zero.

Probit Regression: (Dependent Variable=1 if a firm buys real estate from a related party, =0 if sells)				
Panel A: Real Estate Price Change With 5-year Gap				
Counterparty	Controlling Shareholders		Related Firms	
	coefficient	Pr > ChiSq	coefficient	Pr > ChiSq
Intercept	0.85	75.2%	2.21	13.8%
Debt-to-Asset Ratio	-0.64	51.3%	-1.12	5.6%
Capex-to-FCF	-0.01	91.7%	-0.01	50.5%
ln(Asset)	0.01	93.8%	-0.07	21.1%
Sales Growth	0.51	47.2%	0.03	93.3%
OP Margin	0.06	95.5%	3.45	1.9%
Real Estate Price Change(5-yr)	-0.29	4.3%	0.06	37.1%
Panel B: Real Estate Price Change With 1-year Gap				
Counterparty	Controlling Shareholders		Related Firms	
	coefficient	Pr > ChiSq	coefficient	Pr > ChiSq
Intercept	1.34	62.7%	2.14	15.5%
Debt-to-Asset Ratio	-0.56	55.8%	-1.14	5.2%
Capex-to-FCF	-0.01	88.5%	-0.01	48.8%
ln(Asset)	-0.01	95.0%	-0.07	24.7%
Sales Growth	0.50	48.1%	-0.01	97.5%
OP Margin	0.07	95.0%	3.43	1.9%
Real Estate Price Change(1-yr)	-0.50	2.0%	0.10	32.3%

Table VI

This table presents the results of event studies testing stock market reactions to Korean listed firms' real estate transactions with their related parties. "AR" and "CAR" means "Abnormal Return" and "Cumulative Abnormal Return", respectively. Abnormal return is based upon a market model, $R_{it} = \alpha_{it} + \beta_{it} * R_{mt} + \varepsilon_{it}$. Abnormal return is defined as "$R_{it} - (\alpha_{it} + \beta_{it} * R_{mt})$". α_{it} and β_{it} in the market model are estimated with daily stock return data from D-120 to D-30 for the estimates at D-day.

Transaction Type	Days to Announcement	Obs	AR	CAR
Panel A: Market Reaction to All Real Estate Transactions				
All	D-1	465	-0.285	-0.285
			(-1.93)	(-1.93)
	D-day	465	-0.132	-0.417
			(-0.83)	(-1.84)
	D+1	465	-0.002	-0.418
			(-0.01)	(-1.60)
Panel B: Market Reaction by Transaction Type				
Disposal	D-1	180	-0.339	-0.339
			(-1.32)	(-1.32)
	D-day	180	-0.077	-0.417
			(-0.28)	(-1.05)
	D+1	180	-0.261	-0.678
			(-0.99)	(-1.50)
Acquisition	D-1	245	-0.284	-0.284
			(-1.53)	(-1.53)
	D-day	245	-0.183	-0.466
			(-0.89)	(-1.58)
	D+1	245	0.099	-0.368
			(0.54)	(-1.07)
Panel C: Market Reaction to Controlling Shareholder Transactions				
Disposal To Controlling Shareholders	D-1	22	0.342	0.342
			(0.48)	(0.48)
	D-day	22	0.174	0.516
			(0.25)	(0.73)
	D+1	22	-0.840	-0.324
			(-2.56)	(-0.45)
Acquisition From Controlling Shareholders	D-1	75	-1.248	-1.248
			(-3.37)	(-3.37)
	D-day	75	-0.087	-1.336
			(-0.22)	(-2.20)
	D+1	75	0.548	-0.787
			(1.47)	(-1.21)

Table VII

This table displays the difference of market reactions to listed firms' real estate transactions with their controlling shareholders. Panel A deals with disposals to the controlling shareholders, while Panel B shows acquisitions from the shareholders. In Panel A, "The Most Probable Tunneling Disposal" consists of top 20% disposal transactions where controlling shareholders hold the biggest capital gains from the transactions. "The least Probable Tunneling Disposal" consists of bottom 20% disposal transactions where controlling shareholders realize the least capital gains. Likewise, in Panel B, "The Most Probable Tunneling Acquisition" consists of bottom 20% acquisition transactions where listed firms hold the least capital gains from the transactions. "The least Probable Tunneling Acquisition" consists of top 20% acquisitions where the listed firms realize the biggest capital gains. The definitions of "AR" and "CAR" and the way how they are constructed is the same as explained in Table VI.

Panel A: Market Reaction to Real Estate Disposal to Controlling Shareholders								
	The Most Probable Tunneling Disposal			The Least Likely Tunneling Disposal			Difference	
Days to Announcement	Obs	AR	CAR	Obs	AR	CAR	AR	CAR
D-1	2	-0.593	-0.593	2	2.866	2.866	-3.459	-3.459
		(-0.30)	(-0.30)		(0.72)	(0.72)	(-0.77)	(-0.77)
D-day	2	1.860	1.267	2	-3.292	-0.427	5.152	1.694
		(0.90)	(0.31)		(-0.78)	(-2.20)	(1.10)	(0.42)
D+1	2	-0.274	0.993	2	0.169	-0.283	-0.442	1.276
		(-0.13)	(0.50)		(0.24)	(-0.28)	(-0.20)	(0.57)
Panel B: Market Reaction to Real Estate Acquisition from Controlling Shareholders								
	The Most Probable Tunneling Acquisition			The Least Likely Tunneling Acquisition			Difference	
Days to Announcement	Obs	AR	CAR	Obs	AR	CAR	AR	CAR
D-1	9	-0.522	-0.522	13	-0.597	-0.597	0.074	0.074
		(-0.98)	(-0.98)		(-1.22)	(-1.22)	(0.10)	(0.10)
D-day	10	-0.481	-0.575	13	1.246	0.649	-1.726	-1.224
		(-1.22)	(-0.76)		(0.98)	(0.48)	(-1.29)	(-0.79)
D+1	10	-0.169	-0.743	13	0.698	1.347	-0.866	-2.090
		(-0.27)	(-0.63)		(0.54)	(0.56)	(-0.6)	(-0.78)

Table VIII

This table presents the difference in the market reaction to listed firms' real estate transactions with their related parties, depending on whether an officer designated to attend board meetings where the transactions are approved. "Yes" only contains transactions which the designated officer attends board meetings to approve, while "No" comprises of cases which the officer does not attend board meeting to approve. All the definitions and specifications related to stock market event study is same as shown in Table VI and Table VII.

Market Reaction to Real Estate Transactions							
Transaction Type	Yes/No	Days to Announcement	Obs	AR	CAR	Difference(AR)	Difference(CAR)
Internal Auditor attendance	No	D-1	235	-0.287	-0.287	-0.004	-0.004
	Yes		230	-0.283	-0.283	(-0.01)	(-0.01)
	No	D-day	235	-0.173	-0.460	-0.083	-0.087
	Yes		230	-0.090	-0.373	(-0.26)	(-0.19)
	No	D+1	235	-0.012	-0.471	-0.020	-0.107
	Yes		230	0.009	-0.365	(-0.11)	(-0.20)