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Product Market Competition, Business Groups, and Stock returns: Evidence from U.S-Korea Free Trade Agreement

2. 분야: 재무

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Abstract

This paper empirically shows that stock returns of firms in business groups are significantly lower than non-business group firms when the product market competition increases. Using the U.S.-Korea Free Trade Agreements as an exogenous shock, we examine the effect of the changes in product market competition on the stock returns of business groups. Difference-in-difference-in-differences estimations support the casual impact of product market competition on stock returns of business groups. Overall, the results support the *creative self-destruction theory for stock returns*. Moreover, we suggest evidence that large business groups, such as chaebol may can reduce the external risk through the internal capital market.

Keywords: Creative (self) destruction theory, Difference-in-Difference-in-Differences (DDD), Business groups, Product Market Competition, Schumpeterian, U.S.-Korea Free Trade Agreement

I. Introduction

Recent literature on financial economics focus on various factors that simultaneously affects firms. Also, there has been increasing concerns about the effects of product market competitions on stock returns, and interesting theories and results are reported by many financial researchers (Hou and Robinson, 2006; Butamante and Donangelo, 2017). In this context, there has been several papers on the interaction effect of product market competition and other factors on firms' stock returns, simultaneously. For example, Giroud and Muller (2011) examine whether firms in non-competitive market benefit more from good governance compared to those firms in competitive market. Gu (2016) suggest that R&D intensive firms earn higher returns than firms with weak R&D, especially in competitive industry.

Product market competition has important implications for firms' operating decision, the level of risk in their business environment as well as stock returns. The effect of market competition on the stock returns has only partly been resolved, and still requires further investigation. Hou and Robinson (2006) provide two theories on how firms' stock returns may depend on product market competition The first theory is named *creative destruction theory for stock returns*, which argues that less product market competition industries has lower average stock returns because less competition industries implement less innovation. The second theory is barriers-to-entry hypothesis. Because firms in high barriers to entry industries are relatively free from the threat of new entry, they have less distress risk. Low product market competition means high barriers to entry, in that results they earn

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lower stock returns. However, Bustamante and Donangelo (2017) suggest that, under the barriers-to-entry theory, firms in less competitive industries have higher average stock returns. This means that opposite prediction is possible even under same theory. That is, Hou and Robinson (2006) and Bustamante and Donangelo (2017) provide empirical results on product market competition that are very different from each other, although both studies are based on barriers-to-entry theory.

On the other hand, Morck and Yeung (2003) suggest an alternative theory that family business groups may not result in *creative destruction*, but *creative self-destruction*. They provide an example from plastic firm. An independent plastic firm can increase its value by investing in R&D. However, plastic firm that belongs to family business group may faces only partial profit from the same innovation, because this innovation in plastic firm may decrease the family owned steel firm's profit. This means creative destruction becomes creative self-destruction. More generally, such phenomenon might occur when one family firm develops a superior substitute goods of the products produced by the other firms in the same business group.

Overall, creative destruction theory that product market competition may have positive effects on stock returns. However most of previous literatures predict that product market competition may have negative effects on stock returns. On the other hand, creative self-destruction theory suggests that business groups suffer greater negative effects on stock returns than independent firms when competitions are increasing. This paper investigates whether business groups have lower returns than non-business group firms when they face increasing intensification of product market competition.

Specifically, we investigate whether business group firms earn smaller returns compared to those of independent firms when increasing product market competition. To verify this question, we utilize the U.S.-Korea Free Trade Agreement. Using a large sample of Korean listed firms data, tariff elimination schedules and business groups during the years 2011 and 2012, we conduct difference-in-difference-in-differences test. The results show that business groups have lower returns than non-business group firms when they face increasing intensification of product market competition. Theses empirical results implies that *creative self-destruction theory for stock returns* explains the relationship between product market competition, business groups and stock returns.

This study has a number of contributions to the finance and economic literature. First, we examine how product market competition and business groups effects stock returns. Such attempt is a research theme suitable for the flow of researchers in the current financial field. Secondly, we construct a unique dataset. Most studies on product market competition use Hirschman-Herfindahl Index (HHI) as a proxy for product market competition. However, some studies suggest that HHI index is subject to endogeneity problem (Ali, Klasa and Yeung, 2009). In this paper, we use U.S.-Korea Fair Trade Agreement (U.S.-Korea FTA or KORUS FTA) as a semi-natural experiment for the change of product market competition. This unique dataset is free from endogeneity problem compared to the study by Valta (2012) or Fresard (2010). Even compared to several previous papers using FTA as an exogenous shock to measure product market competition (e.g. Alimov, 2014), we use more sophisticated and appropriate method to Korean economic market. Lastly, this paper deals with intriguing topic about Schumpeter (1942)'s creative destruction theory. It does not only investigate classical aspect but the expansion of Schumpeterian theories in financial economics, especially for stock returns. We extend Schumpeterian theories to the realm of

finance—specifically, to that of product market competition, business group and stock return. We name this theory "*creative self-destruction theory for stock returns*," and provide an empirical result for this theory.

The remainder of this paper is organized as follows. In Section II, We review previous literature and theories in financial economics on product market competition and business groups for stock returns. In this sense, we develop this paper's research hypothesis mainly based on creative destruction and creative self-destruction theories for stock returns. In Section III, we describe the construction of the unique data using U.S.-Korea FTA and Korean business groups and difference in difference in difference methodology. Additionally, we present the summary statistics for the FTA and chaebol categorized samples. Section IV presents the empirical findings for the hypothesis using DDD. The last section V concludes the paper. Additionally, we provide appendix on U.S.-Korea FTA.

II. Theoretical background

A. Product market competition and stock returns

Hou and Robinson (2006) suggest two theories on how industry concentration affects stock returns. First, Schumpeter's (1942) creative destruction theory indicates that innovative management actions and activities occur more frequently in highly competitive industries than in less competitive industries. Because the decisions on innovation often involve investing in risky projects, investors generally require greater compensation for holding the stocks of these "innovative" firms. Therefore, the stock returns of firms in more competitive markets should be greater than those in less competitive markets. Hou and Robinson (2006) named this theory "*creative destruction theory for stock return"*.

Second, Barriers-to-entry theory, developed from Bain's (1954) structure-conduct-performance (S-C-P) paradigm, explains that firms in industries with greater barriers to entry and, therefore, less market competition can seek profits without fearing new competitors. Therefore, firms in less competitive industries are likely to have higher stock returns than firms in more competitive industries. Hou and Robins (2006) argue that high concentrated industry has low return under barriers-to-entry theory, because high concentrated industry has low average distress risk. However, distress risk dealt with a kind of risk-return puzzle by many researchers (Dichev, 1998; Campbell, Hilscher and Szilagyi, 2008), this explain is may not right direction. One more important thing about barriers-to-entry theory for market competition and stock returns is Bustamante and Donangelo (2017) who suggest that *"higher industry aggregate risk represents a barrier to entry, such that riskier industries become less competitive."* This perspective is explained using the same barriers to entry theory, but provides an opposite prediction compared to Hou and Robinson (2006).

B. Business groups and stock returns

Interestingly, creative destruction theory can be applied to the family business group side. For example, Morck and Yeung (2003) argue that allowing the innovation to proceed is clearly very harmful to the family group's

financial interests.[2] The creative destruction becomes *creative self-destruction*. Consistent with these arguments, Morck, Stangeland, and Yeung (2000) find that Canadian firms controlled by heirs are statistically significantly less active in R&D compared to the benchmark firms with same age and size and in the same industries.

According to the *creative self-destruction theory*, a family owned firm A's innovation may reduce other family owned affiliated firm B's profit, if firm A and B are are under the umbrella of the same business group. Morck and Yeung (2003) exemplifies such relationship using steel firm and plastic firm. Because two firms' products are in superior substitute relationship, innovation results in *creative self-destruction*. Most of business groups expect synergy effect when they own different firms. Even if there isn't substitute relationship among member firms' product, their products have some relationship than still may occurs *creative self-destruction* in business groups. Morck and Yeung (2004) and Morck, Wolfenzon and Yeung (2005) suggest corporate groups owners have an incentive to reduce innovation based on *creative self-destruction theory*. This can be viewed as one form of agency problem. In other words, business groups are unwilling to risky innovation, and as a result face lower returns.

Overall, if creative self-destruction describes the relation between profit of business groups owner and risky innovation activities in business groups. This leads to the prediction that business groups have lower returns on average all else equals, because firms that belongs to business groups are reluctant to innovation, especially under intensifying product market competition. We label this phenomenon as *creative self-destruction theory for stock returns*, and build the following hypothesis based on this theory.

Hypothesis: Business group has lower stock returns than independent firms when the product market competition is intensified.

III. Research Designs

A. Difference-in-differences-in differences

For the difference-in-difference-in-differences test, we divide the period before and after Korea-US FTA. Also, we use the firms that produce products in industry with large changes in competition—such as elimination of tariffs—as a control group and firms that produce products in industry with little or no change in tariffs as a treatment group.

We use two ways to distinguish groups: 1) those with and without tariff changes and 2) those with 1.6% tariff change[3]. Ryu et al. (2015) use the modifying Hou and Robinson (2006) and we make based on the three factor model of Fama and French (1993), difference-in-difference regression equations were constructed by adding some variables. Finally, we construct following difference-in-difference-in-differences (DDD) equation. Although

[2] Morck and Yeung (2003) explain creative destruction concept based on Schumpeter (1912, 1942) and also suggest creative-self destruction theory based on Olson (1963, 1982, 2000).

[3] The reason why we use this criteria (1.6%) is because we can divide the two groups into similar numbers through the results of tariff summary statistics. We use the other values (2%, 3%, 4%) to distinguish groups, that results are pretty much same as existing results.

using DID analysis to construct the sub-sample can be meaningful, in order to ensure that statistical differences are observed between family business groups and independent firms, we construct and analyze the DDD setting. The equation for obtaining the DDD estimator is as follows.

$$
\begin{aligned}
r_{i,t} = \alpha + \delta_1 \cdot post\ \ FTA + \delta_2 \cdot H\Delta Tariff + \delta_3 \cdot Family\ \ business\ \ group \quad & + \delta_4 \\
\cdot post\ \ FTA \times H\Delta Tariff + \delta_5 \cdot post\ \ FTA \times Family\ \ business\ \ group \quad & + \delta_6 \\
\cdot Family\ \ business\ \ group\ \ Dummy \times H\Delta Tariff \quad & + \delta_7 \\
\cdot post\ \ FTA \times Family\ \ business\ \ group\ \ Dummy \times H\Delta Tariff + \gamma' \cdot X_{i,t} + \varepsilon_{i,t} &
\end{aligned}
$$

Eq. (1)

In equation (1), the left-hand side $r_{i,t}$ is the stock returns on firm *i* at *t* as a dependent variable.[4] For the adjusted returns, in our sample each stock independently allocated five size groups and five book-to-market equity groups based on their fiscal year values. We form 25 size-B/M portfolios as interaction of the five size and five book-to-market groups. Finally, adjusted returns are calculated by raw returns to each portfolio returns. *Post FTA* is a time period dummy that captures aggregate factors that would cause changes in $r_{i,t}$ even in the absence of tariff change. *Post FTA* has a value of 1 when the year is after FTA effective date, otherwise 0. $H\Delta Tariff$ (tariff change dummy) captures the possible differences between control (firms that not affected by FTA) and treatment groups (firms that affected by FTA) prior to FTA. $H\Delta Tariff$ has a value of 1 when the firm is in high (exist) tariff change group, and 0 when in low (non) tariff change group. *Business group Dummy* denote firm type, if a firm belongs to a business group then the firm has value 1, else has value 0. $X_{i,t}$ means a vector of control variables. As elemental of $X_{i,t}$, we include the different variables for each model such as firm size, book-to-market ratio, two type of leverage, ROE and so on. We provide a detailed definition of the variables used in analysis in the Appendix table A2.

To verify the hypothesis, we conduct a research based on March 15, 2012, the U.S.-Korea FTA effective day. Also, we conduct an empirical analysis of manufacturing firms listed on the Korea Exchange from 2011 to 2012 continuously.[5] This is because manufacturing industries tend to play a role of exogenous factors that directly affect the competition of the product market by promoting external competitors' entry into the market through tariff relaxation. The stock returns and the financial data of the individual firms were extracted using FNdata and TS2000. Also, the firms that were not listed on the exchange during the research period (such as delisting or newly listed within the analysis period), firms that can bias the results—those with negative equity values and whose financial data cannot be obtained--are excluded from the sample. Finally, 742 sample firms are selected and used for the analysis.

[4] We use three measures: raw returns, abnormal returns and adjusted returns. However, we report adjusted returns results only.

[5] At first sample periods are from 2010 to 2013, but concerns about the bias of the sample caused by other FTA event and other issues, we set the sample period from 2011 to 2012.

B. How to adjust tariff change with U.S.-Korea Free trade agreement

In this subsection, we explain precisely distinguish by how much the firm is affected by FTA tariff changes. There is a possibility of problem in the method of measuring the market competition degree using the existing HHI. Also, if the sample and the tariff criteria do not match properly, even though U.S.-Korea FTA event is an exogenous shock to measure market competition, we may not have a clear result. Therefor, we establish a rational direction on how to match tariffs to each firm. The tariff standards are so diverse that it is not possible to apply both the Korean standard industrial classification (KSIC-9)— organized by Statistics Korea—and the industry classification which is classified by the Korea Exchange. It means KSIC-9 cannot clarify how much the actual change of the tariff reduction of the firm is due to U.S.-Korea FTA. Because the tariffs are divided and applied in much greater detail than the industrial classification, and exist difficulty because the industry code is categorized into firms, but tariffs are applied to each item itself.

Fresard (2010) and Valta (2012) use exogenous reductions of import tariff to proxy for the intensity of competition, but that way is still not free from industry level problem, also changes in tariffs over time are not entirely exogenous. Alimov (2014) classify as a group with a large change in tariffs and a group with a small change in tariffs based on a tariff change rate of 5%. And since many firms are engaged in various businesses, the extent to which each firm is exposed to US-Canadian FTA through sales-weighted average and segment's primary four-digit SIC industries classification. Since firms in Korea also have diverse businesses, the above method can be a better way than using the existing HHI, but we want using that tariff in firm level, not industry level and it will be more accurate method. Therefore, the method of applying tariffs on the items with the highest sales composition ratio is more reasonable and appropriate reflecting the direct effect of tariff reduction induced by the FTA on product market competition than Alimov (2014).

In this paper, we collect tariff data from Korea Custom Service FTA portal system and U.S.-Korea FTA agreement. Using this tariff data, we apply the tariff of the largest sale component ratio of products and the second largest sale component ratio of products, and applies the tariff when considering the third largest sales ratio for each firm. If there are no appropriate tariffs are found for the product, or if tariffs are not applicable, the firms are excluded from the sample. In addition, we excluded firms that produce products that have different tariff rates for each sub-item (products), such as pharmaceuticals. For example, since in the subdivision of the same drug, vitamins A, B1, and E follow the tariff reduction schedule A, and vitamin C and D follow the tariff reduction schedule C. For this reasons, it is impossible to judge adequately the degree of tariff reduction applied by the pharmaceutical manufacturing firms.

On the other hand, if the largest sale component ratio of products and the second largest sale component ratio of products are different categories, but are affected by the same tariff reduction schedule, the samples are applied to the analysis. Details of the tariff schedule (categories) are summarized in <Table A1> of the appendix. Since tariffs are applied to items based on the sale component ratio of products in each firm rather than those of the industry, firms belonging to the same industry may be affected by other tariffs, and vice versa. Therefore, it may be quite different from measuring market competition using existing HHI or previous literature.

C. Summary statistics

Table 1 presents descriptive statistics of tariffs and business groups' firms in our sample. Panel A shows the sample number of each tariff rate and Panel B shows sample of U.S-Korea FTA tariff elimination schedules. Compared with Appendix Table A1, we do not use all types of tariff elimination schedule in the study. Also, without considering other schedules, we confirm that the sample of this study is suitable for using the DD or DDD method because the number of immediate tariff elimination sample (category A) is similar the number of non-tariff continuous (category K) samples.

<Table 1 here>

To use the DDD method, we divide the sample into the period before and after the Korea-U.S. FTA and the control group (e.g., firms with little or no change in tariffs) and the treatment group (e.g., firm with large tariff change) based on the degree of tariff change of the products produced by the firms. The tariff change criteria is 1.6% (i.e., above the 1.6% and below 1.6%, respectively), which distinguishes between firms that produce tariff change products and those that not change tariffs (0% change rate). The reason why we made 1.6% as a criteria for divided groups is because the values can be a fairly divide the number of samples to each group.

The tariff change was calculated by subtracting the tariff for the following year from the criteria tariff rate (pre-FTA). For example, if the tariff rate is 10% and the tariff rate is 2% immediately after the Korea-U.S. FTA is implemented, the tariff change rate is 8%. There is very little increase in tariffs due to the Korea-U.S. FTA, and there is no sample with increasing tariffs among the analyzes of this study. Therefore, it means an absolute value that the tariff change is large and small. A large change in tariffs means that tariffs have been reduced accordingly, and as a result, it is possible to interpret this as an increase in market competition due to the ease with which external competitors can enter.

Table 2 shows the summary statistics of the main variables. In Table 2 we see some odd values such as maximum value of adjusted return 900%. Such values may occur bias to the analysis. Therefore, we try to eliminate those values using 1% and 99% winsorization, and we analysis raw data and winsored data. We do not find much different in the result. Therefore, we do not report that results from using the winsorized data, but show the results from using the original data throughout the paper.

<Table 2 here>

IV. Empirical results

A. Main results

Before presenting the results of the DDD analysis, we run sub-sample (business group firms and non-business group firms) DID analysis. The results that the product market competition has different effects on each group.

However, we cannot be sure that results are statistically significantly different between large family business firms and non-family firms.

Table 3 and Table 4 display the difference-in-difference-differences estimates of the effect of product market competition and business groups on stock returns. We use adjusted stock returns as a dependent variable and for the tariff dummy we divided control and treatment group based on 1.6% tariff change. The results that uses other values, such as 2%, 4%, provides similar coefficient and significance.

In Model 1, the coefficient on *FTA*Tariff* (DID estimator) is significantly negative. This result is similar in Table 4. This result suggests that product market competition has negative effects on stock returns. In other words, Hou and Robinson (2006)'s *creative destruction theory for stock returns* is not supported. Model 2 to 9, the coefficients of *Post FTA*Tariff 1*Family group* (DDD estimator) is significantly negative in Table 3. In Table 4, we replace the criteria of divided control and treatment group with 1.6% to change or non-change. Model 2 to 9 *Post FTA*Tariff 2*Family group* (DDD estimator) is also significantly negative. This result support *creative self-destruction theory for stock returns* and research hypothesis: *"Business group has lower stock returns than independent firms when the product market competition is intensified."*

<Table 3 here>

<Table 4 here>

B. Creative self-destruction theory for stock returns and chaebol in Korea

In Korea, family business group is prevalent and we know this is true through the summary statistics. Chaebol is the distinctive family business groups that exists only in Korea. Chaebol is one kind of business group, but its characteristics are quite different from that of other business groups. Historically, the Korean economy has grown as the result of the intervention, planning, and support of its regulatory government, which provided large corporations with various subsidies that help them to compete against their foreign counterparts. These subsidies and the government's firm-friendly policies have allowed the Korean economy to develop quickly. During this development, *chaebol* firms have formed a unique family business group in the Korean economy (Kang, 1997; Kim, 1997; Steer, Shin, and Ungson, 1989).

Chaebols, including groups such as the Samsung, Hyundai Motor, LG, Doosan, and GS groups, comprise 65 business conglomerates and 1,736 subsidiary firms as of April 2016. Their sum of total assets are 2,337 trillion Korean won, and they represent a substantial proportion of the firms listed on the Korea Exchange.[6] These figures indicate the substantial influence that *chaebol* firms have on the Korean economy. Fearing the consequences that the *chaebol*s' bankruptcy could have on the Korean economy, the Korean government has provided *chaebol* firms with numerous supports and subsidies, thereby weakening the role of market competition

[6] Korea fair trade commission, May 1, 2017, press release.

in the Korean stock market and economy (Kim, 1997; Steer, Shin, and Ungson, 1989).[7] Further, previous studies, including Bae, Kang, and Kim (2002), Ferrisa, Kim, and Kitsabunnarat (2004), Joh (2003), Kang, Lee, and Na (2010), and Kim, Hoskisson, Tihanyi, and Hong (2004), provide evidences that *chaebol* firms have a unique, diversified business structure and can affect stock market performance and the business environment.

Therefore, we expect the dominant roles of *chaebol* firms in the Korean economy to alter the effects of market competition to stock returns. Also, this economic environment makes it riskier for the new competitors to enter the market, because chaebol already have strong market power. In this sense, effects of product market competition are not explained well by creative destruction theory for stock returns but can explained by Bustamante and Donangelo (2017)'s barriers to entry theory in Korean financial market.[8] This means that product market competition negatively affects stock returns. Almeida, Kim and Kim (2015) suggest that chaebol internal capital market can helped them avoid the negative effects of the crisis. In this sense, for chaebol firms the *creative self-destruction* effects may be reduced unlike other kinds of family firms, because chaebol affiliated firms have advantage of easily managing their external risks by making them work together when product market competition intensified, such as tariff reduction.

In this context, we test whether the same results are observed when we change the classification from business group and independent firms to chaebol and non-chaebol firms. In Table 5 we report the results of using chaebol dummy variables instead of family business dummy. We use the selection of large business group follows the Korea Fair Trade Commission (KFTC) classification in 2011 and 2012. The difference between Panel A and Panel B is the existence of chaebol CEO or not. The other variables are same as previous analysis. The estimated coefficients of *Post FTA*Tariff 1*chaebol* (DDD1 estimator) are between -13.605 and -16.429, with t-statistics -0.64 and -0.84, and the estimated coefficients of *Post FTA*Tariff 2*chaebol* (DDD2 estimator) are between -28.989 and -31.357, with t-statistics between -1.38 and -1.56. All models show that the estimates of DDD are negative, but not significantly negative in Table 5. Interestingly, there is a definite difference when we compare the results of Table 3 (or Table 4). This results support that chaebol can avoid easily using their internal capital market (Almeida, Kim and Kim, 2015). In this sense, for chaebol firms the *creative self-destruction* effects may be reduced unlike other kinds of family firms, because chaebol affiliated firms have advantage of easily managing their external risks by making them work together when product market competition intensified, such as tariff reduction.

<Table 5 here>

[7] The Korea Fair Trade Commission recently enacted various laws and regulations to curb the corruption and irregularities of *chaebol* firms.

[8] In Korean research, Ryu, Ryu and Hwang (2015) using Free Trade Agreement (FTA) between U.S. and South Korea as an external shock of product market competition. They argue that *creative destruction theory for stock return* is not fit in Korean market.

C. Robustness check

In this part, we examine whether the previous results are robust to different specifications. Table 6 displays the estimates of the difference-in-difference-differences regressions for the products with more than 10% of the import weight from U.S. in Korea. estimates of the effect of product market competition and family business groups (chaebol) on stock returns using by sub-sample construction. Panel A, we use business group dummy for the analysis. The estimated coefficients of DDD1 (*Post FTA*Tariff 1*family*) are -39.302 and -39.729, with t-statistics -2.29 and -2.32, and the estimated coefficients of DDD2 (*Post FTA*Tariff 2*family*) are -47.441 and -47.829, with t-statistics between -2.79 and -2.81. In Panel A all models coefficients of DDD estimator show significantly negative values. Panel B substitutes chaebol dummy for business group dummies, and the results are quite different. In model 3 and 4, coefficients of DDD2 show significantly negative value, but it is marginal and still seems to be a noticeable different significant level when compare to Panel A.

<Table 6 here>

Overall, our results suggest that under increasing competitive pressure from product market, business group harms the equity price. The result is consistent with that of Bustamante and Donangelo (2017), which shows that the threat of entry by new firms lowers exposure to systematic risk of the incumbents. The FTA is an event that perfectly fits into this claim. In increasing competitive pressure situation, business groups are more reluctant to invest in risky innovation. As a results, the stock return decreases compared to other independent firms. However, large family business groups like chaebol can easily avoid the risk from new entrants using internal capital markets, so they have less incentive to reduce innovation than usual in crisis situations.

V. Conclusion

We investigate whether business group firms earn smaller returns compared to those of independent firms when increasing product market competition. To verify this question, we utilize the U.S.-Korea Free Trade Agreement. Using a large sample of Korean listed firms data, tariff elimination schedules and business groups during the years 2011 and 2012, we conduct difference-in-difference-in-differences test. Our empirical results show that the business groups have significantly lower returns than other independent firms when increasing product market competition. This results supports *creative self-destruction theory for stock returns*. However, in case of the chaebol firms, we cannot find evidence that support our hypothesis. This results may be related to the fact that the chaebol has an advantage from their own internal capital market as Almeida, Kim and Kim (2015) suggest. This paper identifies an interesting and important link between product market competition and business groups, explained by the extended version of Schumpeterian theory; *creative self-destruction for stock returns*. Also, this results have implication in the context of the product market competition and another financial factor along with Fresard (2010), Giroud and Muller (2011) and Gu (2016) in financial economics.

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Appendix

<Table A1> U.S.-Korea FTA: Tariff elimination schedule of Korea

This table is summary of tariff schedules of Korea. We revise reference from U.S.-Korea FTA agreement, especially General Notes: Tariff schedule of Korea and Annex 2-B: Tarff Elimination.

Categories	Contents
A	eliminated entirely and such goods shall be duty-free on the date this Agreement enters into force.
B	removed in two equal annual stages beginning on the date this Agreement enters into force, and such goods shall be duty-free, effective January 1 of year two.
C	removed in three equal annual stages beginning on the date this Agreement enters into force, and such goods shall be duty-free, effective January 1 of year three.
D	removed in five equal annual stages beginning on the date this Agreement enters into force, and such goods shall be duty-free, effective January 1 of year five.
E	removed in six equal annual stages beginning on the date this Agreement enters into force, and such goods shall be duty-free, effective January 1 of year six.
F	removed in seven equal annual stages beginning on the date this Agreement enters into force, and such goods shall be duty-free, effective January 1 of year seven.
G	removed in ten equal annual stages beginning on the date this Agreement enters into force, and such goods shall be duty-free, effective January 1 of year ten.
H	removed in 15 equal annual stages beginning on the date this Agreement enters into force, and such goods shall be duty-free, effective January 1 of year 15.
I	reduced by five percent of the base rate beginning on the date this Agreement enters into force. Duties shall be reduced by an additional five percent of the base rate on January 1 of year two, by an additional seven percent of the base rate on January 1 of year three, and by an additional seven percent of the base rate each year thereafter through year five. Duties shall be reduced by an additional ten percent of the base rate on January 1 of year six and by an additional ten percent of the base rate on January 1 of year seven. Duties shall be reduced by an additional 12 percent of the base rate on January 1 of year eight, by an additional 17 percent of the base rate on January 1 of year nine, and by an additional 20 percent of the base rate on January 1 of year ten, and such goods shall be duty-free, effective January 1 of year ten.
J	remain at base rates during years one through eight. Beginning on January 1 of year nine, duties shall be reduced in four equal annual stages, and such goods shall be duty-free, effective January 1 of year 12.
K	continue to receive duty-free treatment.
L	removed in nine equal annual stages beginning on the date this Agreement enters into force, and such goods shall be duty-free, effective January 1 of year nine.
M	removed in 12 equal annual stages beginning on the date this Agreement enters into force, and such goods shall be duty-free, effective January 1 of year 12.
N	reduced to 30 percent *ad valorem* in 15 equal annual stages beginning on the date this Agreement enters into force, and such goods shall be duty-free, effective January 1 of year 16.
O	removed in 18 equal annual stages beginning on the date this Agreement enters into force, and such goods shall be duty-free, effective January 1 of year 18.
P	removed in 20 equal annual stages beginning on the date this Agreement enters into force, and such goods shall be duty-free, effective January 1 of year 20.
Q	removed in equal annual stages beginning on the date this Agreement enters into force, and such goods shall be duty-free, effective January 1, 2014.
T	remain at base rates during years one through ten. Beginning on January 1 of year 11, duties shall be reduced in five equal annual stages, and such goods shall be duty-free, effective January 1 of year 15.
U	1) for goods entered into Korea from December 1 through April 30, duties shall be eliminated entirely and such goods shall be duty-free on the date this Agreement enters into force. 2) for goods entered into Korea from May 1 through November 30, duties shall remain at base rates during years one through seven. Beginning January 1 of year eight, duties shall be reduced in eight equal annual stages, and such goods shall be duty-free, effective January 1 of year 15.
V	1) for goods entered into Korea from May 1 through October 15, duties shall be removed in 17 equal annual stages beginning on the date this Agreement enters into force, and such goods shall be duty-free, effective January 1 of year 17. 2) for goods entered into Korea from October 16

Categories	Contents
	through April 30, duties shall be reduced to 24 percent *ad valorem* on the date this Agreement enters into force. Beginning January 1 of year two, duties shall be removed in four equal annual stages, and such goods shall be duty-free, effective January 1 of year five.
W	1) for goods entered into Korea from September 1 through the end of February, duties shall remain at base rates. 2) for goods entered into Korea from March 1 through August 31, duties shall be reduced to 30 percent ad valorem on the date this Agreement enters into force. Beginning January 1 of year two, duties shall be removed in six equal annual stages, and such goods shall be duty-free, effective January 1 of year seven.
X	remain at base rates
Y	Affect Korea's rights and obligations with respect to its implementation of the commitments set out in the WTO document WT/Let/492 (*Certification of Modifications and Rectifications to Schedule LX – Republic of Korea*) dated April 13, 2005 and any amendments thereto. In the aforementioned WTO document, Korea committed, *inter alia*, to increasing minimum market access for the items identified in staging category Y during the period 2005 to 2014
Z	reduced to 20 percent *ad valorem* on the date this Agreement enters into force. Beginning January 1 of year two, duties shall be removed in nine equal annual stages, and such goods shall be duty-free, effective January 1 of year ten.

<Table A2> Definition of control variables

This table provides definitions of the control variables in this paper. We don't report every coefficient of control variables in the results tables and report only some models. This means some of the control variables may not reported in the main results tables.

Variable name	Definitions
SIZE (firm size)	Natural logarithm of sales for firm *i* in year *t*
LEV (market & book leverage)	1) Total debts divided by market value of equity (common share outstanding times stock price) for firm *i* in year *t* 2) Total debts divided by book value of equity for firm *i* in year *t*
ROA	Earnings before interest and tax (EBIT) divided by total assets for firm *i* in year *t*
ROE	Earnings before interest and tax (EBIT) divided by total equity for firm *i* in year *t*
R&D/S	R&D expenditure divided by sales for firm *i* in year *t*
BtM (book-to-market ratio)	Total equity divided by market value of equity for firm *i* in year *t*
CASHF (cashflow)	Cash flows from operational activities, divided by total assets for firm *i* in year *t*
DIVR (dividend ratio)	Common stock cash dividend divided by market value of equity for firm *i* in year *t*
TVOL (trading volume)	Trading volume divided by common share outstanding for firm *i* in year *t*
BETA (beta)	Beta estimated from the slope of regression $R_i = \alpha + BETA \cdot R_M + \varepsilon_i$, where R_i is firm's daily stock return, R_m is the market (KOSPI) daily return, both measured over a year.
EP	Earnings before interest and tax (EBIT) divided by market value of equity for firm *i* in year *t*
SHOUT (share outstanding)	Natural logarithm of common share outstanding for firm *i* in year *t*
AGE (firm age)	Number of years since the firm has been established: year *t* minus the year of firm establishment

<Table 1> Tariff rate, U.S.-Korea tariff change schedules and family business groups

This table report the sample size of tariff categories, summary statistics of tariff and sample number of family firms and non-family firms. In panel A. each categories meaning is in table A2, except additional negotiation (automobile product) is immediately from 8% to 4%, 4% tariff after cut for four years and elimination of the fifth year.

Panel A. Sample number of each tariff rate

Tariff (%)		**0**	**1**	**2**	**3**	**3.3**	**4**	**4.2**	**4.3**	**5**	**5.2**	**5.3**	**5.5**	**5.8**
Year	2011	345	2	3	4	0	0	10	0	15	0	0	5	0
	2012	680	0	0	0	3	8	0	11	0	1	11	0	3
Tariff (%)		**6.4**	**6.5**	**7.2**	**8**	**11.7**	**13**	**27**	**30**	**48.6**	**50**	**252**	**270**	**Total (*N*)**
Year	2011	0	43	0	281	0	27	0	3	0	1	0	3	742
	2012	12	0	7	0	1	0	1	0	1	0	3	0	742

Panel B. Sample of U.S-Korea FTA tariff elimination schedules (categories)

Year	Categories								
	A	C	D	G	H	K	N	*additional negotiation*	Total
2011	335	24	19	12	3	345	1	3	742
	45.15	3.23	2.56	1.62	0.4	46.50	0.13	0.4	
2012	335	24	19	12	3	345	1	3	742
	45.15	3.23	2.56	1.62	0.4	46.50	0.13	0.4	

Panel C. Tariff rate statistics

Year	N	Mean	Std.	Min	Max
2011	742	5.381	17.523	0	270
2012	742	1.537	16.166	0	252
Tariff change (2011-2012)	742	3.844	4.356	0	30

Panel D. Family business groups

Firm type	N	percentage
Family business group firms	1164	78.17%
Large business group firms	132	8.89%
Chaebol firms (with chaebol CEO)	120	8.09%
Independent firms	320	21.83%

<Table 2> Summary statistics

This summary statistics show the average for 742 firms during 2011 to 2012 (total 1484 observations). All firms are listed KRX both 2011 and 2012. Each variable definition provides in table A2.

Variable	Min	P1	P5	P10	Q1	Median	Q3	P90	P95	P99	Max	Std.	Skew.
Return	-85.87	-69.46	-50	-41.56	-25.965	-6.11	21.885	62.3	100	228.17	900	61.48	4.91
Adj. Ret.	-110.888	-87.938	-62.844	-51.029	-29.986	-8.674	15.239	49.389	86.436	212.379	856.803	59.33	4.708
Exc. Ret.	-86.73	-70.46	-50.67	-42.25	-26.57	-6.74	21.305	61.54	99.29	227.31	899.00	61.473	4.908
SIZE	15.917	16.635	17.289	17.611	18.144	18.754	19.645	20.678	21.543	23.804	25.922	1.369	1.354
B/M	0.024	0.164	0.329	0.428	0.704	1.163	1.834	2.741	3.347	4.799	7.684	0.996	1.706
Lev. (M)	0.035	0.07	0.135	0.188	0.314	0.49	0.608	0.715	0.774	0.878	0.994	0.197	-0.108
Lev. (B)	0.178	0.461	1.309	2.065	4.492	9.902	20.916	38.12	54.921	120.180	364.722	23.597	5.102
CASHF	-0.387	-0.189	-0.082	-0.057	-0.003	0.042	0.091	0.144	0.187	0.259	0.471	0.085	-0.019
BETA	-0.619	0.037	0.236	0.335	0.56	0.879	1.192	1.457	1.59	1.804	2.265	0.419	0.088
SD	0.099	0.184	0.263	0.307	0.385	0.495	0.62	0.771	0.842	1.016	1.285	0.179	0.667
TVOL	0.000	0.000	0.000	0.000	0.001	0.003	0.008	0.024	0.048	0.184	0.512	0.034	7.416
ROA	-1.207	-0.383	-0.166	-0.082	-0.004	0.028	0.066	0.108	0.142	0.208	2.281	0.124	1.698
AGE	0	2	7	10	13	25	39	50	56	65	95	15.834	0.604
SHOUT	12.848	13.710	14.604	15.396	15.912	16.431	17.092	17.74	18.2	19.07	20.358	1.032	-0.064
R&D/S	0.000	0.000	0.000	0.000	0.000	0.003	0.017	0.043	0.066	0.135	0.534	0.030	6.240
DIVR	0.000	0.000	0.000	0.000	0.000	0.007	0.019	0.031	0.042	0.064	0.242	0.016	3.551
EP	-9.574	-1.484	-0.464	-0.217	-0.011	0.062	0.131	0.202	0.254	0.391	9.464	0.476	-1.871

<Table 3> Main results: Difference-in-difference-in-differences results (High tariff changed groups vs. low tariff changed groups)

This table show the difference-indifference-in-differences analysis results. The dependent variable is adjusted returns, the post FTA dummy variable that take 1 when the year is 2012, tariff dummy variable take 1 when a firm belongs to the high tariff changed groups. Family group dummy variable that take 1 when a firm is in the Family business groups. T-statistics are in parentheses, each ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent variable: Adjusted returns (*N*=1484)									
Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Intercept	-14.394	-0.524	2.598	-145.744***	-81.571**	-9.777	-2.099	-155.48***	-84.912**
	(-0.49)	(-0.02)	(0.09)	(-4.09)	(-2.18)	(-0.32)	(-0.07)	(-4.36)	(-2.26)
Post FTA	7.232*	-6.748	-8.896	-3.867	-0.489	-6.366	-8.693	-3.563	-0.43
	(1.68)	(-0.76)	(-1.01)	(-0.46)	(-0.06)	(-0.72)	(-0.98)	(-0.42)	(-0.05)
Tariff 1 (High vs. low)	13.109***	-3.739	-4.54	-2.814	-3.389	-4.327	-5.025	-3.479	-3.576
	(3.02)	(-0.4)	(-0.49)	(-0.32)	(-0.39)	(-0.47)	(-0.54)	(-0.4)	(-0.41)
DID1 (FTA*Tariff1)	-15.471**	11.5	11.79	10.918	9.3	11.139	11.529	10.552	9.204
	(-2.52)	(0.88)	(0.9)	(0.88)	(0.76)	(0.85)	(0.88)	(0.85)	(0.75)
Family business group* Tariff		22.011**	20.621**	17.233*	15.057	22.418**	21.036**	17.741*	15.204
		(2.1)	(1.98)	(1.74)	(1.54)	(2.13)	(2.02)	(1.79)	(1.56)
DDD1 (Post FTA*Tariff 1* Family business)		***-34.668****	***-33.723****	***-31.494****	***-30.499****	***-34.142****	***-33.333****	***-30.892****	***-30.272****
		(-2.33)	***(-2.29)***	***(-2.25)***	***(-2.21)***	***(-2.3)***	***(-2.26)***	***(-2.21)***	***(-2.19)***
Family business group		-14.601**	-13.421*	-14.52**	-13.325**	-15.372**	-14.026*	-15.364**	-13.6**
		(-2.02)	(-1.87)	(-2.13)	(-1.98)	(-2.12)	(-1.95)	(-2.25)	(-2.02)
Family business group* Post FTA		18.144*	17.142*	18.79**	17.519*	17.905*	16.998*	18.555*	17.451*
		(1.79)	(1.7)	(1.97)	(1.86)	(1.77)	(1.69)	(1.94)	(1.85)
Control variables	SIZE, B/M	SIZE, B/M, Leverage(M)	SIZE, B/M, Leverage(M), CASHF, BETA	SIZE, B/M, Leverage(M), CASHF, BETA, TVOL, ROE, AGE, SD	SIZE, B/M, Leverage(M), CASHF, BETA, TVOL, ROE, AGE, SD, SHOUT, R&D/S, EP	SIZE, B/M, Leverage(B)	SIZE, B/M, Leverage(B), CASHF, BETA	SIZE, B/M, Leverage(B), CASHF, BETA, TVOL, ROE, AGE, SD	SIZE, B/M, Leverage(B), CASHF, BETA, TVOL, ROE, AGE, SD, SHOUT, R&D/S, EP
R^2	0.014	0.021	0.036	0.135	0.163	0.021	0.037	0.136	0.163
Adj. R^2	0.01	0.015	0.028	0.126	0.152	0.014	0.029	0.127	0.152

<Table 4> Main results: Difference-in-difference-in-differences results (Tariff reduction groups vs. tariff non-changed groups)

This table show the difference-indifference-in-differences analysis results. The dependent variable is adjusted returns, the post FTA dummy variable that take 1 when the year is 2012, tariff dummy variable take 1 when a firm belongs to the tariff reduction groups. Family group dummy variable that take 1 when a firm is in the Family business groups. T-statistics are in parentheses, each ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent variable: Adjusted returns (*N*=1484)									
Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Intercept	-12.21	5.191	7.58	-142.085***	-79.164**	-4.933	2.288	-152.432***	-82.629**
	(-0.41)	(0.17)	(0.25)	(-3.98)	(-2.11)	(-0.16)	(0.08)	(-4.27)	(-2.19)
Post FTA	7.1	-10.541	-12.776	-8.002	-4.157	-9.945	-12.417	-7.488	-4.043
	(1.58)	(-1.13)	(-1.38)	(-0.91)	(-0.48)	(-1.07)	(-1.34)	(-0.85)	(-0.46)
Tariff 2 (reduction vs. non-changed)	13.288***	-7.126	-8.006	-7.02	-7.248	-6.954	-7.859	-6.777	-7.131
	(3.05)	(-0.77)	(-0.87)	(-0.8)	(-0.84)	(-0.75)	(-0.85)	(-0.78)	(-0.83)
DID2 (FTA*Tariff1)	-13.946**	17.852	18.35	18.089	15.612	17.119	17.801	17.338	15.416
	(-2.27)	(1.36)	(1.41)	(1.47)	(1.28)	(1.31)	(1.37)	(1.41)	(1.27)
Family business group* Tariff		26.891**	25.174**	21.942**	18.754*	26.332**	24.845**	21.366**	18.509*
		(2.57)	(2.42)	(2.22)	(1.92)	(2.51)	(2.39)	(2.16)	(1.9)
DDD2 (Post FTA*Tariff 2* Family business)		***-41.035*****	***-40.282*****	***-38.433*****	***-36.509*****	***-40.136*****	***-39.606*****	***-37.444*****	***-36.178*****
		(-2.77)	***(-2.74)***	***(-2.75)***	***(-2.65)***	***(-2.71)***	***(-2.69)***	***(-2.68)***	***(-2.63)***
Family business group		-17.98**	-16.597**	-17.595**	-15.839**	-18.288**	-16.846**	-17.914**	-15.92**
		(-2.38)	(-2.21)	(-2.47)	(-2.25)	(-2.42)	(-2.24)	(-2.51)	(-2.26)
Family business group* Post FTA		22.94**	22.02**	23.727**	21.929**	22.485**	21.712**	23.266**	21.798**
		(2.16)	(2.09)	(2.37)	(2.22)	(2.12)	(2.06)	(2.32)	(2.2)
Control variables	SIZE, B/M	SIZE, B/M, Leverage(M)	SIZE, B/M, Leverage(M), CASHF, BETA	SIZE, B/M, Leverage(M), CASHF, BETA, TVOL, ROE, AGE, SD	SIZE, B/M, Leverage(M), CASHF, BETA, TVOL, ROE, AGE, SD, SHOUT, R&D/S, EP	SIZE, B/M, Leverage(B)	SIZE, B/M, Leverage(B), CASHF, BETA	SIZE, B/M, Leverage(B), CASHF, BETA, TVOL, ROE, AGE, SD	SIZE, B/M, Leverage(B), CASHF, BETA, TVOL, ROE, AGE, SD, SHOUT, R&D/S, EP
R^2	0.013	0.023	0.037	0.136	0.163	0.023	0.038	0.137	0.163
Adj. R^2	0.01	0.016	0.029	0.127	0.152	0.016	0.03	0.128	0.152

<Table 5> Chaebol: Large family business groups

This table shows that difference-indifference-in-differences analysis results. Each variable is same as previous construct of analysis, but family business classification is different. The selection of the large business group firms follows the KFTC classification in 2011 and 2012. In Panel A. chaebol dummy variable that take 1 when a firm is in the large business group. In Panel B. chaebol dummy variable that take 1 when a firm is in the large family business group with chaebol CEO. DDD is calculated by *Post FTA*Tariff*LBG (chaebol)*. T-statistics are in parentheses, each ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A. LBG: large business group firms include chaebol (N=1484)					
Variable	Model 1	Model 2	Variable	Model 3	Model 4
Post FTA	11.431***	11.432***	Post FTA	10.483**	10.493**
	(2.66)	(2.66)		(2.34)	(2.34)
Tariff 1	8.506**	8.439**	Tariff 2	6.809	6.76
	(2)	(1.98)		(1.58)	(1.57)
FTA × Tariff 1	-12.75**	-12.722**	FTA × Tariff 2	-9.942*	-9.931*
	(-2.14)	(-2.13)		(-1.66)	(-1.66)
LBG × Tariff 1	-4.601	-4.423	LBG× Tariff 2	3.287	3.383
	(-0.32)	(-0.31)		(0.23)	(0.23)
DDD1	***-16.7***	***-16.429***	***DDD2***	***-31.357***	***-31.119***
	(-0.84)	***(-0.82)***		***(-1.56)***	***(-1.55)***
LBG	-20.068*	-20.411*	LBG	-24.346**	-24.65**
	(-1.9)	(-1.94)		(-2.16)	(-2.2)
LBG × Post FTA	16.14	16.249	LBG × Post FTA	25.945*	26.07*
	(1.16)	(1.17)		(1.73)	(1.74)
Control variables	SIZE, B/M, CASHF, BETA, TVOL, ROE, AGE, SD, SHOUT, R&D/S, EP		Control variables	SIZE, B/M, CASHF, BETA, TVOL, ROE, AGE, SD, SHOUT, R&D/S, EP	
	Lev(M)	Lev(B)		Lev(M)	Lev(B)
R^2	0.166	0.166	R^2	0.166	0.166
Adj. R^2	0.155	0.155	Adj. R^2	0.155	0.155
Panel B. Chaebol: Large family business group firms with chaebol CEO (N=1484)					
Variable	Model 1	Model 2	Variable	Model 3	Model 4
Post FTA	11.826***	11.826***	Post FTA	10.916**	10.923**
	(2.76)	(2.76)		(2.45)	(2.45)
Tariff 1	8.583**	8.513**	Tariff 2	6.995	6.941
	(2.02)	(2.01)		(1.63)	(1.62)
FTA × Tariff 1	-13.255**	-13.22**	FTA × Tariff 2	-10.486*	-10.468*
	(-2.23)	(-2.22)		(-1.76)	(-1.76)
Chaebol × Tariff 1	-4.644	-4.476	Chaebol × Tariff 2	3.466	3.54
	(-0.31)	(-0.3)		(0.23)	(0.23)
DDD1	***-13.605***	***-13.32***	***DDD2***	***-29.23***	***-28.989***
	(-0.65)	***(-0.64)***		***(-1.39)***	***(-1.38)***
Chaebol	-16.329	-16.663	Chaebol	-20.88*	-21.169*
	(-1.49)	(-1.52)		(-1.76)	(-1.79)
Chaebol × Post FTA	13.634	13.756	Chaebol × Post FTA	24.159	24.3
	(0.93)	(0.94)		(1.52)	(1.53)
Control variables	SIZE, B/M, CASHF, BETA, TVOL, ROE, AGE, SD, SHOUT, R&D/S, EP		Control variables	SIZE, B/M, CASHF, BETA, TVOL, ROE, AGE, SD, SHOUT, R&D/S, EP	
	Lev(M)	Lev(B),		Lev(M)	Lev(B),
R^2	0.163	0.163	R^2	0.164	0.164
Adj. R^2	0.153	0.153	Adj. R^2	0.153	0.153

<Table6> Robustness test: products with more than 10% of the import weight from the U.S.

This table shows that difference-indifference-in-differences analysis results, using products with more than 10% of the import weight from the U.S. in Korea. Each variable is same as previous analysis. In Panel A., we use family business group dummy variable that take 1 when a firm is in the family business group. In Panel B. chaebol dummy variable take 1 when a firm is in the large business group that follows KFTC classification. T-statistics are in parentheses, each ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A. Family business groups firms (N=1084)					
Variable	Model 1	Model 2	Variable	Model 3	Model 4
Post FTA	1.108	1.405	Post FTA	-3.864	-3.585
	(0.11)	(0.14)		(-0.37)	(-0.34)
Tariff 1	-9.323	-9.317	Tariff 2	-13.031	-13.171
	(-0.89)	(-0.89)		(-1.26)	(-1.27)
FTA × Tariff 1	11.367	11.125	FTA × Tariff 2	20.679	20.498
	(0.74)	(0.73)		(1.36)	(1.35)
Family × Tariff 1	20.402*	20.082*	Family × Tariff 2	23.044**	22.762*
	(1.74)	(1.71)		(1.98)	(1.96)
DDD1	***-39.729****	***-39.302****	***DDD2***	***-47.829*****	***-47.441*****
	(-2.32)	***(-2.29)***		***(-2.81)***	***(-2.79)***
Family	-12.503	-12.106	Family	-14.701*	-14.305*
	(-1.59)	(-1.53)		(-1.8)	(-1.75)
Family × Post FTA	19.762*	19.291*	Family × Post FTA	25.491**	25.014**
	(1.73)	(1.69)		(2.14)	(2.1)
Control variables	SIZE, B/M, CASHF, BETA, TVOL, ROE, AGE, SD, SHOUT, R&D/S, EP		Control variables	SIZE, B/M, CASHF, BETA, TVOL, ROE, AGE, SD, SHOUT, R&D/S, EP	
	Lev(M)	Lev(B)		Lev(M)	Lev(B)
R^2	0.207	0.207	R^2	0.207	0.207
Adj. R^2	0.193	0.193	Adj. R^2	0.193	0.193
Panel B. Chaebol: Large business group firms (N=1084)					
Variable	Model 1	Model 2	Variable	Model 3	Model 4
Post FTA	14.302***	14.255***	Post FTA	12.77**	12.703**
	(2.79)	(2.78)		(2.4)	(2.39)
Tariff 1	6.83	6.599	Tariff 2	4.421	4.095
	(1.34)	(1.3)		(0.86)	(0.8)
FTA × Tariff 1	-18.147**	-18.118**	FTA × Tariff 2	-13.57*	-13.509*
	(-2.49)	(-2.48)		(-1.86)	(-1.86)
Chaebol × Tariff 1	-1.936	-1.733	Chaebol × Tariff 2	6.997	7.263
	(-0.11)	(-0.1)		(0.4)	(0.42)
DDD1	***-23.017***	***-22.745***	***DDD2***	***-47.395****	***-47.231****
	(-0.93)	***(-0.92)***		***(-1.89)***	***(-1.88)***
Chaebol	-19.339	-19.631	Chaebol	-24.863*	-25.188*
	(-1.54)	(-1.56)		(-1.82)	(-1.85)
Chaebol × Post FTA	24.612	24.605	Chaebol × Post FTA	42.644**	42.665**
	(1.43)	(1.43)		(2.22)	(2.22)
Control variables	SIZE, B/M, CASHF, BETA, TVOL, ROE, AGE, SD, SHOUT, R&D/S, EP		Control variables	SIZE, B/M, CASHF, BETA, TVOL, ROE, AGE, SD, SHOUT, R&D/S, EP	
	Lev(M)	Lev(B)		Lev(M)	Lev(B)
R^2	0.207	0.208	R^2	0.208	0.209
Adj. R^2	0.193	0.194	Adj. R^2	0.194	0.194