THE EFFECT OF THE FAST-TRACK CORPORATE REHABILITATION PROGRAM ON THE INTEREST COVERAGE RATIO OF THE COMPANIES UNDER COURT RECEIVERSHIP

Young Jun Choi [*]

* Economic Research Institute, The Bank of Korea, Republic of Korea
Contact details: 39 Namdaemun-ro, Jung-gu, Seoul 04531, Republic of Korea

OPEN ACCESS

Abstract

Given the fact that a swift rehabilitation procedure is very critical due to the risk of the collapse of business foundation (e.g. falling asset value), this paper analyzes the effect of the Fast-track program, introduced to address insolvent companies swiftly. A Differences-in-Differences model is used to analyze and compare the prior-and-post effects of the program. The analysis result shows that the effect of this program on ICR (interest coverage ratio), representing the degree of rehabilitation, is positive; but its statistical significance is low. This is because the business foundation has been undermined around the time of receivership; and even after the termination of the receivership, the program effect is limited due to the bankruptcy stigma. The same result is observed in estimations by company size and by industry. This result has following implications. First, to improve the effect of Fast-track, institutional efforts are required to reduce disadvantages induced by the bankruptcy stigma (e.g. a fall in credit rating and high-risk premiums). Next, as observed in the empirical analysis of steel and shipbuilding, the effect of the Fast-track may not be exercised to the full with weakened industrial competitiveness. Therefore, restructuring efforts such as business reshuffle are necessary.

Keywords: Corporate restructuring, Court receivership, Fast-track program, Bankruptcy stigma, Differences-in-Differences model

1. INTRODUCTION

The two methods for corporate restructuring in Korea, work-out by creditors and receivership by court, did not properly work together in recent restructuring processes of STX Offshore & Shipbuilding company, Hanjin Shipping company and others. Deciding to launch rehabilitation proceedings for STX on August 1st, 2016, the Seoul Central District Court pointed out that the rehabilitation probability of STX would have risen if creditors had made a swift decision on giving D grade to the company. This financially strapped company filed for court receivership on May 27th, 2016. Meanwhile, in the case of Hanjin, the government and creditors refused to extend additional support to this company on the grounds that support for insolvent companies went against restructuring principles. However, the court unprecedentedly decided to start rehabilitation procedures on September 1st, 2016, one day after Hanjin's filing for receivership (August 31th, 2016), considering the significance of the matter. In addition, the court actively sold off the company assets to prevent its liquidation. For example, after launching the Hanjin receivership, the Seoul Central District Court decided Samra Midas Group (SM) to acquire Hanjin's Asia-US network and the share of LA-Long beach terminal on Nov. 11th 2016. In the

case of Daewoo Shipbuilding & Marine Engineering company, however, finance support to this company has been continued via state-backed banks, despite great losses from accounting frauds, on the grounds that its receivership may result in the delivery delay of vessels under construction.

In this context, the role of court in restructuring insolvent companies has been enhanced while the necessity of setting up the foundation of market-led restructuring is emphasized. The Financial Services Commission and the Financial Supervisory Service (2017) considered that there was a problem in the current restructuring system where the grade of companies was decided via the credit risk evaluation: the C grade for work-out and D grade for court receivership. Thus, they announced the "New Restructuring Policy" on the 13th of April, 2017. It aims at conducting the credit risk evaluation based on objective grounds, previously having relied on the qualitative judgement by creditors' financial institutions, as well as building up the foundation for capital market participants (e.g. Private Equity Fund, PEF) to take the lead in corporate restructuring in the long run. In order for swift rehabilitation proceedings, the Fast-track corporate rehabilitation program which reduces the period from the rehab decision to the rehab plan approval to less than six months was introduced in April 2011; and the Bankruptcy Court was established, combining the advantages of work-out and receivership in March 2017. With the establishment of the Bankruptcy Court, the Financial Services Commission is expected to facilitate the Pre-packaged plan: if creditors submit the pre-plan including refunding and the court approves it, restructuring can be converted into the creditor led work-out after the consultation with the court. Such movements reflect the significance of speedy rehabilitation since rehabilitation procedures are inevitably accompanied with the collapse of business foundation such as falling asset values and the severance of transactions.

Based on this uncertainty related with recent corporate restructuring process, we try to evaluate policy or institution of corporate restructuring by econometric methodology in order to grasp the cause of this kind of confusion. However, it is not easy to find relevant case due to the fact that the court would not reveal the list of receivership firms because of the stigma effect. Thus, we pay attention to the Fast-track program mentioned above, considering an availability of the quantitative analysis. Indeed, the quantitative analysis on the program is possible unlike other cases because the period from the beginning of rehabilitation to the approval of the rehabilitation plan is less than six months. According to this standard, we can extract relevant companies' data from the KIS-Value. Therefore, we could say that this paper examines whether the Fast-track program, introduced for a swift restructuring, is really effective in improving the interest coverage ratio (ICR), an indicator representing the degree of corporate rehabilitation, by using the Differences-in-Differences (DiD) model.

The remainder of this paper is organized as follows. Section 2 examines previous research as well as restructuring agents. Section 3 reviews the methodology of the DiD model and implements the empirical analysis. The last section concludes with a summary and implications.

2. PREVIOUS RESEARCH & CORPORATE RESTRUCTURING AGENT

2.1. Previous research

According to previous research on corporate restructuring, restructuring outcomes vary depending on the economic situation of a country. As for the US, restructuring based on market principles (e.g. via acquisition) leads to positive results. Meanwhile, Korean and Japanese cases show that restructuring led by creditor banks has a negative impact on their economy in the short-run but is effective in improving macro-indicators in the long-term.

In the US where restructuring via the financial market is frequent and active, the effects of MBO (Management Buyout) and LBO (Leveraged Buyout) are revealed to be positive. MBO (Management Buyout) means that professional managers or employees purchase the entire or part of the assets and operations of an insolvent company, and LBO (Leveraged Buyout) refers to the acquisition of the entire or part of assets of an insolvent company with borrowed money. Smart and Waldfogel (1994) reveal that MBO has made contributions to improving business performances. They analyse and compare business performances prior to and post implementation of the MBO program, and compare real business performances with virtual performances under the assumption that MBO is not carried out. Bruton, Keels, and Scifres (2002), by using real data, prove the validity of the Agency theory: business performances improve if the ownership share of managers becomes larger through the LBO program. That is, comparing the performance of an LBO company with i) its previous performance prior to the implementation of LBO, ii) the average performance of the companies in the same field, and iii) the performance of similar companies, but not employing LBO, the results accord with the expectation of the Agency theory.

According to the studies analyzing the cases of Korea and Japan where creditor banks play a critical role, restructuring generally improves business performances and macro-indicators in the long-run while negatively affecting the economy in the short-term. Kang and Shivdasani (1997) compare the fluctuation of business profit rates between restructuring companies and general companies in Japan and lead to a conclusion that those which have gone through asset reduction and employment adjustment show better performances than general ones. Kim (2004) compares performance indices (operating profit rate, interest coverage rate, and ROA) by restructuring type (corporate reorganization, vergleich and work-out) in the wake of the Asian financial crisis. The result shows that restructuring outcomes are generally positive; but in the case of work-out, the improvement in debt-repayment capacity is insufficient since this program is not legally binding. Choi (2004) analyzes the business performances of insolvent companies before and after carrying out M&A and reveals that M&A is helpful in upgrading sales and profitabilities

while reducing the bankruptcy probability. Lee (2011) demonstrates the growing share of insolvent small-and-mid-sized companies in a specific industry undermines normal SMEs' investments and employment, based on the empirical analysis using the 1995 to 2009 micro-data by the company. Kim (2004) and Lee (2011) carry out a simulation analysis for Japan and Korea, respectively, on the total output and employment of the overall economy if labour and capital of unproductive companies are transferred to productive ones. According to the result, the total output and employment are deteriorated in the short-run but improve in the long-run.

Meanwhile, studies on the performance of court-led restructuring show that such restructuring is inefficient during a crisis due to explosive bankruptcies; but in a normal time, it is an effective restructuring method in a country with a matured capital market like the US. World Bank (1999) insists that more than 80% of corporate restructuring in a crisis is carried out through a private agreement between interested parties, rather than an official procedure by the court; since it is almost impossible to rely only on an official bankruptcy procedure due to a rapidly growing number of insolvent companies. Gilson (1997) reports that the transaction cost of private restructuring is bigger than that of court-led restructuring based on the comparison of restructuring transaction costs in the US during a normal time.

As for Korea, Moon (2013) insists that bankrupt companies should be dealt with a due procedure than a temporary restructuring by the government or the Creditor financial Institution Council. Oh (2008) also argues that restructuring based on the rule of law is a more efficient way, rather than government officials determine the destiny of a major company. That is, instead of implementing work-out based on the Corporate Restructuring Promotion Act, they claim that it is more appropriate for the court to address bankrupt companies.

Shin (2017) recently points out that local marginal companies become more vulnerable due to the sluggish process of corporate restructuring; and suggests that corporate restructuring should be carried out by the capital market (e.g. M&A) and through the strengthened relationship between banks and companies under the Corporate Restructuring Promotion Act (implemented in March 2016). However, Shin (2017)'s view is somewhat different from the recent direction of the Financial Services Commission (FSC) and the Financial Supervisory Service (FSS): the existing creditor-led restructuring should be diversified into the pre-packaged plan and market-led corporate restructuring.

The novelty of this paper is that while existing literature analyze comparative performances of corporate restructuring between market-led and creditors' approach or deal with corporate restructuring in court with a normative and logical experiment, this paper fills the gap of the existing literature by using a robust econometric methodology, natural experiment with a view to analyzing the effect of one of the court's policy for corporate restructuring on the degree of rehabilitation.

2.2 Assessment of corporate restructuring agents

In this section, we evaluate the performances of four corporate restructuring agents (government, work-out, receivership and capital market) and before the quantitative analysis, roughly review whether there exists the real effect of court-led restructuring based on data analysis.

2.2.1 Government

After the global financial crisis, the FSC (2012) insists, corporate restructuring should be led by markets (e.g. M&A) in principle, and the creditor-led (the Corporate Restructuring Promotion Act) or court-led restructuring(the Integrated Insolvency Act) are employed as complementary measures. In addition, it argues that the government should be indirectly involved in corporate restructuring, mainly focusing on the improvement in policies.

However, the Korean government has been directly involved in the recent restructuring processes of STX Offshore & Shipbuilding company, Daewoo Shipbuilding & Marine Engineering company, and Hanjin Shipping company. STX newly received 4.5 trillion won from state-backed banks after the 2013 voluntary agreement and underwent restructuring for 38 months. However, on the 25th of May, 2016, STX was finally decided to be put under court receivership. In June 2015, Daewoo Shipbuilding & Marine Engineering announced about 3trillion won in losses induced by accounting fraud incidents in 2013 and 2014. Deloitte Anjin LLC, the auditing company of Daewoo Shipbuilding & Marine Engineering company, acquiesced in Daewoo's accounting fraud of exaggerating its sales by reducing executive budgets (totally expected construction cost) during the 2013 external auditing. In 2014, this accounting firm found out the manipulation of the balance sheet of Daewoo, but it announced that the shipbuilding's financial situation was optimal. Yet, specialized banks injected 6.5 trillion won into this company by 2015 since court receivership was considered to bring about even larger losses. If the government had not decided to extend support for Daewoo in 2015, that could have led to refund guarantee calls of some ship-owners, and then creditors could have suffered more damages (the Munhwa Ilbo newspaper, December 2, 2016, p.16).

In April 2017, however, as the repayment of corporate bonds reaching maturity became uncertain, the Korean Development Bank (KDB), a major shareholder, became highly active for the debt payment rescheduling of Daewoo. The National Pension Service, Daewoo's largest bondholder, refused the rescheduling at first but accepted the proposal on April 17th, 2017 after negotiating with the KDB. Thereby, fresh funds of 2.9 trillion won were injected into Daewoo by the KDB and Export-Import Bank of Korea (KEXIM). Meanwhile, after entering into a voluntary agreement in May 2016, Hanjin asked for creditors to take on insufficient 800 billion won out of 1.3 trillion which this company needed by 2017 to overcome its liquidity crisis. However, the government and creditors decided to place Hanjin under court receivership; since its self-rescue outline was not enough and support for insolvent companies was against

restructuring principle. On the 31th of August 2016, Hanjin Shipping filed for court receivership, and Samil Pwc submitted an estimated liquidation value for Hanjin to the Seoul Central District Court in 2016. On the 2nd of February 2017, the court decided to discontinue the rehabilitation procedure and declared bankruptcy for Hanjin on the 17th of Feb. 2017.

There is another case for the direct intervention of the Korean government. Japan consecutively filed a complaint with OECD in May and December 2016, insisting that the Korean government's support for the shipbuilding and shipping industry be against the trade agreement. In the 122nd OECD Council Working Party on Shipbuilding (WP6) meeting held in May 2016, the Japanese Ministry of land, infrastructure, transport, and tourism raised a question of whether the support of public financial agencies for Daewoo was based on market principle. In December 2016, Japan also argued that the unfair support of the Korean government for Daewoo distorted the shipbuilding industry, requiring the correction. The Japanese Ministry argued that the role of government－facing the oversupply of the shipping industry should be restricted to supporting facility reduction and resolving employment issues, and financial support such as the purchasing of non-performing loans should be banned.

In this context, some point out that the recent restructuring policy needs to take an "intelligent intermediate stand", rather than both extremes: led by the private sector or government (Rodrik 2004). That is, market power and private entrepreneurship should take the lead while government carries out a strategic coordinating role, going beyond the past roles of protecting the right to own property or forcing the fulfillment of a contract. This new government role is partly represented in the UK industrial activism of 2008 (HM Government 2009). Specifically, support for declining industries is banned while business opportunities in emerging sectors (e.g. new technologies, technology-intensive services and green industry) are promoted. In addition, conditions to help the growth of small-sized innovators are created; restructuring and reshuffle of existing industries are encouraged, and the value-chain are maintained and developed.

Considering recent discussions on the role of government in corporate restructuring, the restructuring policy of the Korean government should be focused on strategic coordination, rather than active intervention. Japan's complaints against the support for Daewoo implies that government should conduct only a supervisory function on the market while decision making on specific restructuring plans is left to the market. This suggests that ex-post and active government intervention into restructuring cannot help being restricted.

2.2.2 Work-out

The work-out system was introduced in June 1998 during the Asian financial crisis before the implementation of the Integrated Insolvency law (April 2006). The Corporate Restructuring Promotion Act was first enacted in 2001 with a sunset clause to secure the legally binding force of "the Financial Institution Agreement for Promotion of Corporate restructuring (work-out agreement)" which 210 financial institutions signed in June 1998 during the Asian financial crisis. However, this law came into force for the fifth time on Mar.18 2016 (from Mar.2016 to June.2018) by extending its expiration date. The system was devised under the awareness that the court-led restructuring procedure (e.g. company reorganization and compromise) had caused some problems, and funding for companies suffering from temporary financial difficulties was not enough. The composition procedure under the Composition Act (enacted on January 1st, 1962, abolished on April 1st, 2006) was widely used during the Asian financial crisis (1996 to 1997) since business owners could maintain their management right under this procedure. As this policy was wrongly employed as an expedient to secure the management right, however, the Composition Act was revised on February 24th, 1998 to ban large companies from employing the composition policy. In the case of company reorganization based on the Company Reorganization Act (enacted on Dec. 12th, 1962, abolished on Apr. 1st 2006), the court deprived business owners of the right of management and gave the right to a third party appointed by the court; thus, it was called court receivership. Business owners avoided implementing the company reorganization policy to secure their management right.

The work-out under "the Corporate Restructuring Promotion Act" led by creditor financial institutions could be considered the case that the business reorganization based on a Debtor in Possession (DIP) of Chapter 11 of US bankruptcy law is implemented outside the court (Jung 2012). That is, debtor companies' rehabilitation is actively supported by creditors' DIP financing under the supervision of the creditor financial institutions committee; and debt adjustment is swiftly carried out through debt reduction, debt-equity swap and extending time limits while current managers are allowed to continue business. The biggest advantage of this policy is that it can help a company－suffering from temporary financial difficulties－to normalize its management via debt readjustment and fresh credit offering without receivership proceedings. Meanwhile, one of the reasons for temporarily maintaining the work-out even after the enactment of the Integrated Insolvency Act in 2006 is that once the court is involved, business insolvency is seen as a definite fact. Accordingly, corporate rehabilitation through smooth restructuring becomes difficult as normal management is almost impossible.

However, looking at the major management indexes of work-out companies, we cannot find a noticeable improvement trend around the time of the work-out implementation except for few years, which is not matching with the intention of introducing this system (See Figure 1). This result may be due to the fact that it becomes more difficult for companies to get additional loans on account of the reduced role of and conflicts between creditor banks; as the borrowing structure of companies is reorganized centering on corporate bond and commercial paper.

Figure 1. Changes in major financial indexes before and after work-out
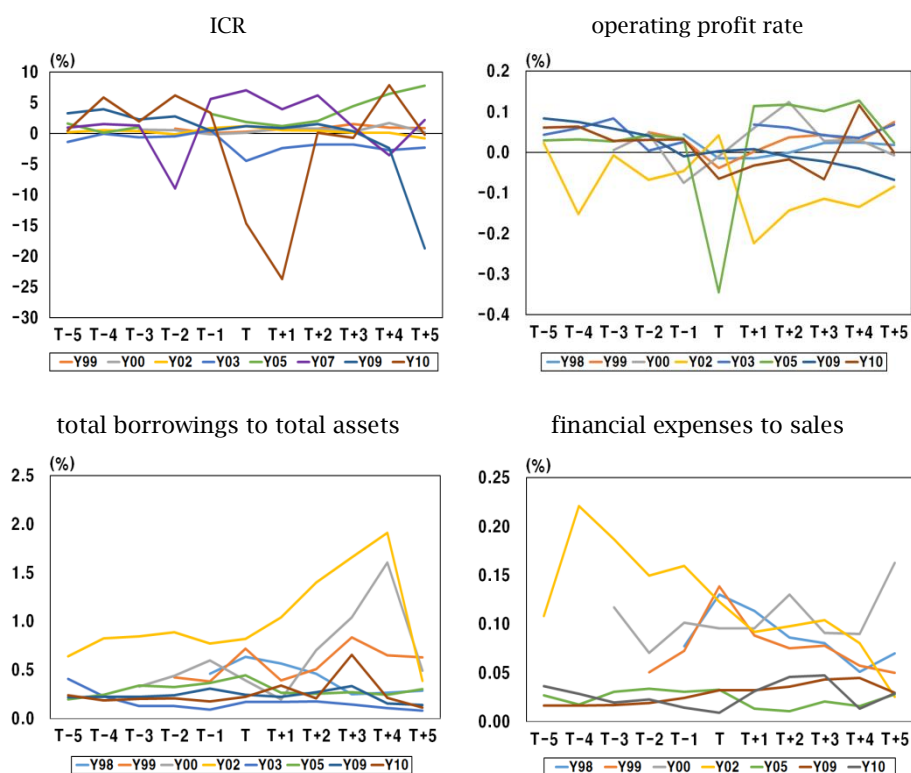
Above figures show that changes in important financial indexes before and after work-out. Each one is calculated by below formula. Y00 refers to the year 2000 when work-out is implemented.

ICR (interest coverage ratio) = (operating profits/interest expenses) × 100
Operating profit rate = (operating profits/total assets) × 100
Borrowings to total assets = (debts/total assets) × 100
Financial expenses to sales = (interest expenses/sales) × 100

2.2.3 Court receivership

The court-led restructuring began to be actively employed after the 1997 Asian financial crisis with massive corporate bankruptcies. Then, the IMF required an advanced liquidation policy. According to the IMF's requirements, the government revised the Bankruptcy Act, the Composition Act and the Corporate Reorganization Act in Feb. 1998, with other relevant laws. In Mar. 2005, the government enacted the Integrated Insolvency Act while abolishing the Bankruptcy Act, the Composition Act, the Corporate Reorganization Act, and the Individual debtor rehabilitation Act. Thereby, the corporate rehabilitation procedure of the Integrated Insolvency Act (implemented on April 1st, 2006) began to be used as one of the corporate restructuring ways.

The Debtor Rehabilitation Act adopts the debtor-in-possession system (DIP) in principle, in which incumbent managers can maintain the management right unless financial difficulties are induced by property misappropriation, concealment and poor management. In addition, this Act allows the creditor council to monitor and supervise incumbent managers by enhancing its authority and functions. Under the Integrated Insolvency Act, the court launches receivership procedures after freezing bonds and debts of a company determined to be put under court receivership as a result of

credit assessment. In case the residual value is less than the rehabilitation value, the insolvent company is liquidated. This Integrated Insolvency Act, however, has some disadvantages: it takes quite a long time to terminate rehabilitation procedures, and creditor financial institutions become reluctant to participate in rehabilitation procedures as they are required to accumulate allowances for bad debts of rehabilitation companies.

To resolve such problems, the court has implemented the Fast-track rehabilitation program since April 2011 for swift rehabilitation proceedings; and revised the Integrated Insolvency Act in 2016 in a bid to enhance the authority of creditors. The Fast-track rehabilitation program is a way to bring an insolvent company back to the market swiftly in case the pre-negotiation between creditors is possible. To this end, the creditor-led corporate restructuring should be over as soon as possible (within six months) via employing the pre-packaged plan under the current law and combining the work-out and rehabilitation procedures (Yoo, 2011). Here, the six-month is the period from the decision on rehabilitation to the approval of rehabilitation plan: the corporate rehabilitation procedure is practically over with the approval of rehabilitation plan (Jung 2012). The rehabilitation plan is a comprehensive scheme covering all issues including restructuring and debt-restructuring of a target company, as well

as a new contract with creditors. This plan immediately becomes effective from the moment of approval decision. In addition, according to Article 283 in the Integrated Insolvency Act, once the rehabilitation plan is approved and repayment starts based on the plan, the court should terminate rehabilitation procedures unless it is recognized that there are problems in implementing the rehabilitation plan. Such a swift decision is to prevent the collapse of credit rating and business foundation of the company under rehabilitation proceedings. In the US, it is more frequently observed that creditors are immediately selling important assets of debtor companies at the early stage of reconstruction proceedings based on Article 363 of the Federal Bankruptcy Act, which speeds up restructuring.

Meanwhile, if creditors offer DIP financing, their authority becomes enhanced, which aims to encourage creditor financial institutions to actively participate in rehabilitation proceedings. According to the revised Integrated Insolvency Act, which passed the National Assembly in Dec. 2106, creditors who provide fresh funds are granted the authority of suggesting opinions on the major issues of rehabilitation proceedings, as well as the authority of requiring data to an administrator. Major management indices of receivership firms deteriorate before receivership, but after that distinctively improve. For five years after the launch, however, there are no dramatic changes observed, compared to the prior to receivership (See Figure 2). Such improvement in indices may be owing to the fact that the Integrated Insolvency Act provides support to improve the rehabilitation system, such as adopting the DIP and Fast-track, unlike the previous Bankruptcy Act.

Figure 2. Changes in major financial indexes before and after court receivership
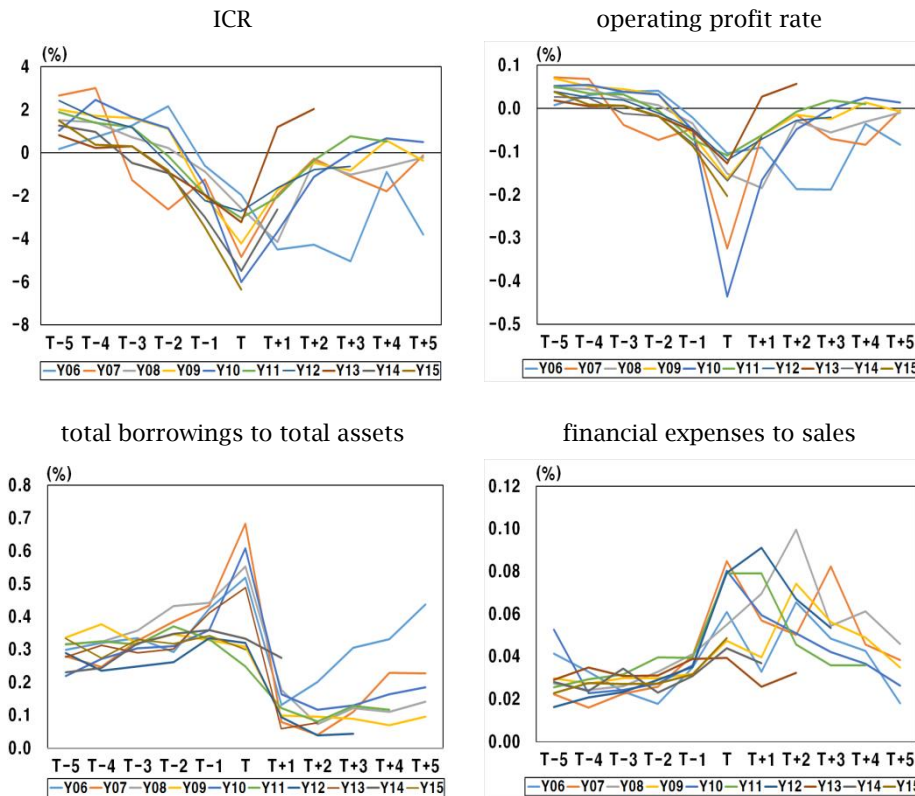
Above figures show that changes in important financial indexes before and after court receivership. Each one is calculated by below formula. Y00 refers to the year 2000 when court receivership is implemented.
ICR (interest coverage ratio) = (operating profits/interest expenses) × 100
Operating profit rate = (operating profits/total assets) × 100
Borrowings to total assets = (debts/total assets) × 100
Financial expenses to sales = (interest expenses/sales) × 100

2.2.4 Capital market

For the last 10 years, only 25.7% out of total 690 Private Equity Funds (PEF) have directly participated in the management of invested companies as a strategic investor (FSS 2015). PEF is a strategic investment vehicle, introduced to promote corporate restructuring; since the introduction of PEF, its quantitative scale has been dramatically growing. As of the end of June 2016, the total number and aggregate commitment amount of PEFs are 342 and 60.3 trillion won (invested capital: 41.2 trillion won), respectively, showing a sharp increase from 2 and 0.4 trillion won (0.3 trillion won) in Dec. 2004 (See Figure 3). The amount that Limited partners promise to invest in PEF when general partners require, is referred to as aggregate commitment amount; and actual investments are called invested capital.

However, most of the local general partners are mainly invested in local firms and prefer financial investment to a strategic one. That is, there are still limitations for PEF to play as a corporate restructuring agent. Figure 4 shows that investment share of local PEF into local firms. The local PEF is established as a form of the Limited Partnership like many other overseas PEFs. Its governance is composed of Limited Partner (LP), simple investors, and General Partner (GP) involved in investments and operations. LPs are a few high-net-worth individual investors and institutional investors who take responsibility only within the range of their investment, and their investment details are not open to the public. As for GPs, they set up funds and take responsibility for investments and operations, in which asset management firms and banks are involved (Kang 2007). This can also be confirmed by the fact that PEFs mainly support large firms' restructuring. Figure 3 shows that the total number and aggregate commitment amount of local PEF.
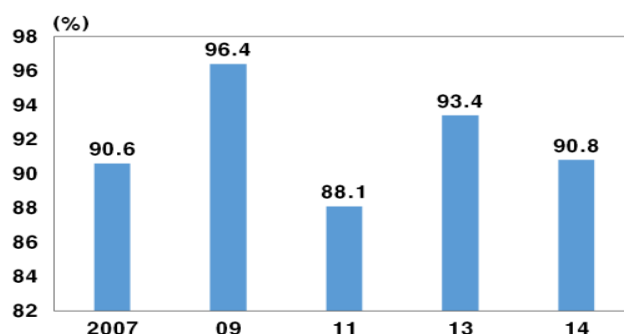
Table 1 shows that most of local PEF support for large company restructuring.

Figure 3. Local PEF aggregate commitment
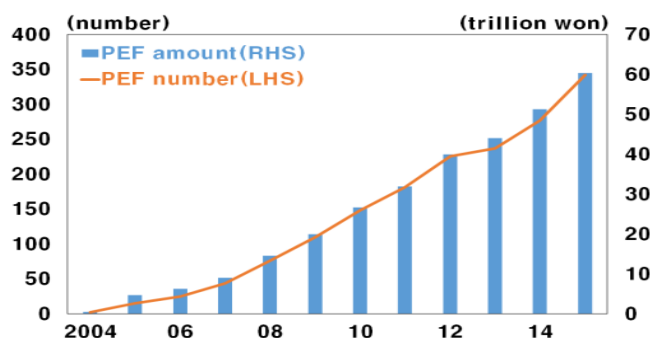
Source: FSS (Aug. 2016)

Figure 4. Investment share of local PEF into local firms

Source: FSS (Mar. 2015)

Table 1. PEF support for large company restructuring

Company	*Case*
Doosan	• In 2008, it sold 100% stake in Techpack to MBK partners for 400 billion won. • In 2009, it sold 49% stake in Doosan DST, Korea Aerospace Industries (KAI), SRS Korea, and Samhwa Crown & Closure to Mirae Asset-IMM PE for 780 billion won. • In 2011, it sold 20% stake in Doosan Infracore China Corporation (DICC) to IMM, Mirae Asset and Hana financial Investment PE for 380 billion won. • In 2012, it sold Burger King to Vogo Fund at 110 billion.
Kumho Asiana	• In 2010, it sold Kumho Life Insurance to KDB PE-Consus Asset Mgt at 650 billion won. • In 2011, it sold Daewoo E&C to KDB PE at 3.3 trillion won. • In 2011, it sold Kumho Express (100%), Seoul Express Bus terminal (38.7%), Daewoo E&C (12.4%) to IBK Securities PE-Keiston Partners at 950 billion won.
Hyundai	• In 2014, it sold Hyundai Logistics to Orix PE for 600 billion won. • In 2014, it sold Hyundai Merchant Marine's LNG Business to IMM PE for 500 billion won.
Dongbu	• In 2014, it sold Dongbu express to KTB PE and Q capital for 310 billion won.
Hanjin	• In 2014, it sold Hanjin Shipping's Cargo Carrier Business at around 600 billion won.
Woongjin	• In 2014, it sold Woongjin Coway to MBK Partners at 1.2 trillion won. • In 2014, Hahn & Company acquired Woongjin Food at 115 billion won by capital increase with consideration.
Dongyang	• In 2014, it sold Dongyang Magic to NH PEF at 280 billion won.
STX	• In 2015, it sold Pan Ocean under court receivership to Harim-JKL consortium at 1.05 billion won.

Source: Park, Yongrin (2016)

3. EMPIRICAL ANALYSIS

3.1. Methodology

The DiD method is developed to apply the methodology of the natural sciences—controlling other conditions except for exogenous experiments—to the non-experimental data of the social sciences. That is, this is a quasi-experimental methodology: examining whether the effect of a treatment group, directly affected by policy changes, is different from the effect of a control group; and then analysing the policy effect. One of the advantages of this method is that omitted variables—affecting both an experimental group and control group can be controlled by analyzing temporal changes in differences among samples (Berger and Roman 2016).

This is represented by following equations and figures. First, we assume that there are two groups ($Treat_i$): a treatment group is 1 and a control group is 0; and two periods ($Post_i$): the period before policy implementation is 0 and after implementation is 1.

$$Y_i = \alpha + \gamma Post_i + \lambda Treat_i + \delta(Post_i \times Treat_i) + \epsilon_i \quad (1)$$

Y_i is a response variable representing the degree of rehabilitation

$$\begin{cases} Treat = 0 : control\ group \\ Treat = 1 : treatment\ group \end{cases} \begin{cases} Post = 0 : prior \\ Post = 1 : post \end{cases}$$
$$E(\epsilon|Post, Treat) = 0$$

According to the relationship between the treatment group ($Treat_i$) and the post implementation variable ($Post_i$), following values are calculated.

$$E(Y|Post, Treat) = \alpha + \gamma Post_i + \lambda Treat_i + \delta(Post_i \times Treat_i) \quad (2)$$

$$E(Y|Post = 1, Treat = 1) = \alpha + \gamma + \lambda + \delta \quad (3)$$

$$E(Y|Post = 1, Treat = 0) = \alpha + \gamma \quad (4)$$

$$E(Y|Post = 0, Treat = 1) = \alpha + \lambda \quad (5)$$

$$E(Y|Post = 0, Treat = 0) = \alpha \quad (6)$$

In this equation, α represents the mean value of response variables in the control group before policy implementation; $\alpha + \lambda$ is the mean value of the treatment group before implementation; $\alpha + \gamma$ is the mean value of the control group after implementation; and $\alpha + \gamma + \lambda + \delta$ is the mean value of the treatment group after implementation. The coefficient δ of ($Post_i \times Treat_i$), a core coefficient in DiD, is equal to the value of subtracting the treatment-and-control group difference before implementation from the difference after implementation.

$$\delta = \{E(Y|Post = 1, Treat = 1) - E(Y|Post = 1, Treat = 0)\} - \{E(Y|Post = 0, Treat = 1) - E(Y|Post = 0, Treat = 0)\} \quad (7)$$

$$\delta = \{[\alpha + \gamma + \lambda + \delta] - [\alpha + \gamma]\} - \{[\alpha + \lambda] - [\alpha]\} \quad (8)$$

Dividing equation (7) into prior to and post-policy implementation, we can obtain equation (9).

$$\delta = \{E(Y|Post = 1, Treat = 1) - E(Y|Post = 0, Treat = 1)\} - \{E(Y|Post = 1, Treat = 0) - E(Y|Post = 0, Treat = 0)\} \quad (9)$$

This means that the post-implementation effect includes the normal difference (the original gap between the two groups before implementation) and the causal difference (the gap between the two after implementation); thus, by deducting the normal difference, the net policy effect can be extracted.

Looking at Figure 5, δ or DiD estimator $\hat{\beta}_1^{DiD}$ is the value of deducting the average change of Y in the control group from that of Y in the treatment group.

$$\delta = \hat{\beta}_1^{DiD} = (\bar{Y}^{treatment,\ after} - \bar{Y}^{treatment,\ before}) - (\bar{Y}^{control,\ after} - \bar{Y}^{control,\ before}) \quad (10)$$

where: $\bar{Y}^{treatment,\ after}$: the average of Y in the treatment group after policy implementation
$\bar{Y}^{treatment,\ before}$: the average of Y in the treatment group before policy implementation
$\bar{Y}^{control,\ after}$: the average of Y in the control group after policy implementation
$\bar{Y}^{control,\ before}$: the average of Y in the control group before policy implementation

Apply specific numbers to the equation. If the average values of Y in the treatment and control group are 40 and 20, respectively, before policy implementation, and increase to 80 and 30 after implementation, then the value of DiD estimator $\hat{\beta}_1^{DiD}$ is calculated as (80-40)-(30-20)=80-50=30 in equation (10). That is, in Figure 5, (A-B) is 50, the gap between the two groups after implementation (standard difference estimator); (C-B) is 20, the gap without implementation (counterfactual normal difference); and (A-C) is 30, the net policy effect (DiD estimator). In other words, the DiD estimator of 30 is calculated by deducting the counterfactual normal difference of 20 from the standard difference estimator of 50.

Figure 5 shows that the meaning of DiD estimator intuitively. $\bar{Y}^{treatment,\ after}$ means an average of Y (treatment group) after implementation, and $\bar{Y}^{treatment,\ before}$ is an average of Y (treatment group) before implementation. On the other hand, $\bar{Y}^{control,\ after}$ is an average of Y (control group) after implementation, and $\bar{Y}^{control,\ before}$ means an average of Y (control group) before implementation.

Figure 5. DiD Estimator
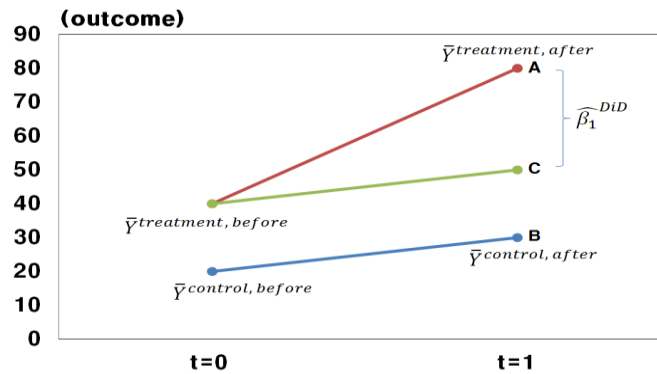
Source: Revision of Stock and Watson (2011)

In a bid to analyze the effect of the court-led Fast-track program, we set up the following DiD estimation model by adding δ_i, representing the heterogeneous characteristics of time-invariant companies:

$$y_{it} = \alpha_0 + \alpha_1 FT_{it} + \alpha_2 Post_t + \alpha_3(FT_{it} \times Post_t) + \alpha_4 X_{it-1} + \delta_i + \epsilon_{it} \qquad (11)$$

The dependent variable, y_{it} denotes an ICR of i company in the year t. This paper uses an indicator, ICR, among other financial outcome indicators of rehabilitation companies; since ICR is known to pursue corporate profit goals, as well as covering all details of corporate restructuring (Kang 2004). Corporate restructuring, first of all, aims to improve the debt repayment ability of companies via debt-restructuring and asset-disposals, and then, helps companies to seek profits to return to be normal. ICR is an indicator showing whether a company generates enough operating profits to bear interest expenses. In order for an ICR to exceed a certain level, debt-restructuring should be carried out and a certain amount of operating profits should be generated to endure interest expenses. Therefore, this indicator can be considered to represent whether corporate rehabilitation will be successful or not. However, ICR cannot represent the activities during rehabilitation procedures, which will help the company to improve its future value. This limitation should be considered.

FT_{it} is a binary variable: this variable value is 1 when less than six months is the period from the date of deciding the launch of rehabilitation to the date of approving the rehabilitation plan, otherwise 0, during the analysis period from 2000 to 2015. The court does not officially reveal the list of companies coming into the Fast-track rehabilitation program. Thus, this paper regards those whose period from rehab decision to the approval of rehab plan is less than six months as companies subject to the Fast-track.

In case regions or financial institutions are subject to analysis on policy changes, the values of the treatment and control group do not change before and after policy implementation. In this paper, however, subject to policy implementation is a receivership company whose value becomes different depending on the time of deciding the rehabilitation launch; thus, the treatment variable is not FT_i, but FT_{it}. Lee (2014) examines how the education level changes upon the degree of exposure to war via DiD for the people who were fetuses during the Korean war. In this research, Lee (2014)

also sets up and analyzes the model where a time variable, which is not affected by a unit in DiD, changes depending on a unit, beyond the standard DiD model.

For example, among panel data, the FT_{it} value of a company whose rehabilitation is decided in 2013 is 0 from 2000 to 2012 and 1 from 2013 to 2015. Previous research also uses a modified standard DiD model when causal differences can be secured.

Meanwhile, $Post_t$ is a binary variable: the value is 1 after 2011 at a time when the Fast-tack program was first introduced, and 0 for the prior to 2011. We write 2011 since we use an annual data. However, in a real estimation, we set up 1 after April 2011 and 0 before April 2011.

In addition, $FT_{it} \times Post_t$ is the interaction term of FT_{it} and $Post_t$, in which the treatment group after introducing the program is included. The coefficient, α_3, is most vital in representing the degree of rehabilitation of a receivership company whose period from rehabilitation launch to rehabilitation plan approval is less than six months. That is, α_3 is the DiD estimator $\hat{\beta}_1^{DiD}$, as mentioned above.

A control variable, X_{it-1} is employed in a bid to control covariates which change depending on the treatment group, the control group and time; or which may have impact on corporate rehabilitation. This control variable incorporates years in business, size (logarithm value of total assets) and the share of main items out of total sales. It is impossible to find all variables showing the causal relationship with result variables (dependent variables) in observation data (non-experimental data). Thus, in order to prevent such omitted variables from causing endogeneity problems by being included into error terms, I add control variables having correlation with omitted variables but not having the causal relationship with dependent variables. Meanwhile, I set a time difference to reduce the possible correlation between control variables and error terms. In addition, I cluster standard errors to consider the issues on autocorrelation and

heteroscedasticity which can occur within the cross-sectional unit (company).

Next, equation (12) is made up by adding the time fixed effect, $Time_t$ to equation (11) to control the effect of macro-shocks such as an economic cycle.

$$y_{it} = \alpha_0 + \alpha_1 FT_{it} + \alpha_2 Post_t + \alpha_3(FT_{it} \times Post_t) + \alpha_4 X_{it-1} + \alpha_5 Time_t + \delta_i + \epsilon_{it} \tag{12}$$

3.2 Data

We use annual data for the period from 2000 to 2015 of 1,483 receivership companies on the KIS-Value as of the end of October 2016. In the KIS-Value, receivership companies are not arranged in a time-series; and thus, only identified are those on the list of court-receivership at the time of inquiry. The company data include the date of filing for and deciding rehabilitation as well as the approving date of the rehabilitation plan. When comparing the number of companies in a treatment and control group before and after the Fast-track program, 42 (10.3%) and 366 (89.7%) are included in the treatment and control group, respectively, for 10 years prior to the introduction (2000 to Mar. 2011); but each number rapidly increases to 212 (19.7%) and 863 (80.3%) for 5 years (Apr. 2011 to 2015) after introduction (See Table 2), among 1,483 receivership companies. As for the period prior to the Fast-track program, we define a treatment group as companies whose period from rehabilitation decision to the approval of the rehabilitation plan is less than six months, otherwise a control group (hereinafter the same) for convenience, in order to compare the company numbers of the two groups before and after the Fast-track (April 2011).

This table shows that the number of receivership firms used for analysis as of the end of October 2016. Prior to Fast-track implementation (Jan. 2000~Mar. 2011) period is not subject to Fast-track; but for the firm of the post and prior to the policy, we define a treatment group as firms whose period from the rehabilitation decision to the approval of rehabilitation plan is less than six months; and others are classified as a control group for convenience.

Table 2. Number of receivership firms subject to analysis

total number (A+B)	*prior to Fast-track implementation (Jan. 2000~Mar. 2011)*			*post Fast-track implementation (Apr. 2011~Dec. 2015)*		
	total(A)	*treatment group*	*control group*	*total (B)*	*treatment group*	*control group*
1,483	408 (100.0)	42 (10.3)	366 (89.7)	1,075 (100.0)	212 (19.7)	863 (80.3)

Source: KIS-Value (calculated by the author)

We believe that the issue of survival bias is not critical since the data on receivership companies of the KIS-Value remain on the list no matter whether they are delisted or liquidated. For reference, we employ the two-step method of Heckman (1979) to quantitatively review the representativeness of receivership company data used in this paper. According to the result, we cannot say that selection bias exists because the estimated coefficient of the inverse Mills ratio is not statistically significant. We estimate the probit model in which the binary variable (*FT*), representing the application of the Fast-track at the first-stage selection equation of the Heckman (1979) model, is a dependent variable; the number of employees is an exclusion restriction, and control variables are independent variables. The exclusion restriction is employed due to the following reason: if the independent variable of the first-stage selection equation is the same as that of the second-stage ordinary least squares (OLS), the standard error of coefficients could be overestimated due to the correlation between the inverse Mill's ratio (estimated in the first-stage selection equation) and the covariate of the second-stage OLS; and the non-linearity of the first-stage selection equation (probit model) is undermined, hampering the model identification. Here, the number of employees is used as the exclusion restriction, but this variable does not seem to have a direct relation with ICR, the dependent variable of the second-stage OLS.

Meanwhile, we employ years in business, size (logarithm of total assets) and the share of main items out of total sales, in a bid to control the differences in basic corporate characteristics of the treatment and control group. Referring to Shin (2005, 2006), we add following control variables: 「operating profits/total assets」, profitability index used in the probability theory of corporate insolvency; 「debts/total assets」, financial structure and expenses index; 「net working capital/total assets」 and 「cashable assets/total assets」, liquidity indexes; and 「added value/sales」, productivity index (See Table 3). In an empirical analysis, 10% at both extremes are deleted to exclude the effect of an outlier. Summary statistics of these variables are demonstrated as follows

Table 3 below shows that the formula used for the variables of empirical analysis. Table 4 provides the descriptive statistics of the variables used in this study. ICR is interest coverage ratio; size is the logarithm of total assets; years in business is the age of each firm.

Table 3. Data

Variable	Formula
profitability	operating profits/total assets
financial structure and expenses	borrowings (long-and-short-term loans + private loans)/total assets
liquidity	net working capital (liquidity assets - liquid liabilities)/total assets
	cashable assets (cash & cash equivalent + short-term financial assets)/total assets
productivity	added value ratio (added value/sales)

Table 4. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ICR	16,145	1.37077	3.55411	-4.84755	7.84148
size	17,032	23.30538	1.11105	21.57436	25.17717
years in business	20,554	13.03771	7.95221	3	28
share of major products (%)	4,734	81.65398	21.36828	45.31	100
operating profits/total assets	16,956	0.018685	0.08656	-0.16063	0.12956
borrowings/total assets	17,032	0.36127	0.23705	0	0.72203
net working capital/total assets	17,032	-0.02637	0.28946	-0.55571	0.38395
cashable assets/total assets	16,904	0.03424	0.03929	0.00090	0.11951
added value/sales	9,239	0.24243	0.12478	0.07613	0.47549

First, looking at the company size of the treatment and control group before and after introducing the Fast-track program, there is not a single large company in the treatment group before introduction; but after that, the number increases to 31 while the number of small-and-mid sized companies rises to 181 from 42 (See Table 5). In terms of main banks, the number of commercial banks soars to 145 from 31 while special banks also sharply increase to 67 from 11 in the treatment group after implementing the Fast-track. We use the main-bank data on the collecting date from the KIS-Value (the end of Oct. 2016); since the main bank of receivership companies frequently changes.

Looking at the top five industries by large category, manufacturing shows the largest number of 22 and 99 before and after implementation, respectively; and construction surges from 5 to 49 after introducing the program. As for years in business, the number of 11 to 20-year companies is similar to that of 21 to 30-year ones, with 17 to 18 before the Fast-track. After implementation, however, the number of 11 to 20-year companies goes up to 82, relatively a large surge. Looking at the number of top-ranking companies by detailed category, the number is largest in textile goods manufacturing (except clothing) (C13) followed by wholesale & commodities brokerage (G46) and rubber & plastic goods manufacturing (C22) before implementing the Fast-track; after that, the number of companies in electronic parts, computer, image,

sound and communications equipment manufacturing (C26) becomes greatest followed by general construction (F41) and professional construction (F42), indicating a distinct increase in the companies of the construction sector.

Receivership companies spending less than six months from their rehab launch to the plan approval. The main bank of receivership companies is frequently changed; thus we use the data of the collecting date (late Oct. 2016). Special banks: the Korean development bank, Export-import bank of Korea, an Industrial bank of Korea, National Agricultural Cooperative Federation, National Federation of Fisheries Cooperatives. The period from the foundation date to Dec. 31, 2015. The industry is categorized by KSIC (Korea standard industry classification). J means publication, image, broadcasting communications, information service. By detailed KSIC, C13 means textile goods manufacturing (except for clothing); C14 means clothing, accessory & fur product manufacturing; C22 means rubber & plastic goods manufacturing; C24 means primary metal manufacturing; C26 means electronic components, computer, image, sound & communications equipment manufacturing; C29 means other machinery & equipment manufacturing; C31 means other transportation equipment manufacturing; F41 means general construction; F42 means professional construction; G46 means wholesale & commodities brokerage.

Table 5. Comparison of Treatment and Control Group after Fast-Track implementation

Group	Characteristics		prior to Fast-track	post-Fast-track
Treatment Group	total number		42	212
	large company		0	31
	small-and-mid company		42	181
	the main bank	commercial bank	31	145
		special bank	11	67
	industry by large category	C (manufacturing)	29	99
		F (construction)	5	49
		G (wholesale & retail)	5	22
		J	0	11
		H (transportation)	1	7
	years in business	1~10	1	38
		11~20	17	82
		21~30	18	51
		31~40	5	19
		41~50	0	11
		over 50 years	1	11
	industry by detailed category		C13(5)	C26(25)
			G46(5)	F41(25)
			C22(3)	F42(24)
			C24(3)	C29(22)
			C26(3)	G46(19)
Control Group	total number		366	863
	large company		27	54
	small-mid company		339	809
	the main bank	commercial bank	255	549
		special bank	111	314
	industry by large category	C (manufacturing)	235	555
		F (construction)	68	99
		G (wholesale & retail)	21	65
		J	6	21
		H (transportation)	5	19

Source: KIS-Value (calculated by the author)

Figure 6 displays the comparison between the treatment and control group after introducing the Fast-track program. By company size, the number of small-mid companies (181) is greater than that of large companies (31) in the treatment group. By the main bank, the number of commercial banks is 145 and special banks are 67, indicating that commercial banks are more used in both groups. By years in business, the number of 11 to 20-year companies (from the foundation to the end of 2015) is the largest 82 in the treatment group; 51 companies have survived for 21 to 30 years; and 38 for 1 to 10 years. The number of more than 30 year companies is relatively small. As for the top five industries (large category, number) in the treatment group, manufacturing (C) has 99 companies; construction (F) 49; wholesale & retail (G) 22; publication, image, broadcasting communications and information service (J) 11; and transportation (H) 7. In the top five industries (number) by detailed category in the treatment group, electronic parts, computer, image, sound and communications equipment manufacturing (C26) and general construction (F41) show the largest number of 25, followed by professional construction (F42) of 24 and other machine & equipment manufacturing (C29) of 22.

professional construction refers to industrial activities, professionally carrying out a specific-sector construction, associated with civil engineering and building by commissions or contracts. Next, whole sale & commodities brokerage (G46) has 19 companies; clothing, accessary & fur goods (C14) has 8; and other transportation equipment manufacturing (C31) has 7.

Meanwhile, in a DiD analysis, the parallel-trend assumption, where the covariance between error terms and cross terms is 0, should be established, implying that there is no difference between the treatment and control group before implementing the Fast-track program. This means $Cov(\epsilon_{it}, FT_{it} \times Post_t) = 0$.

During the period of 2000 to 2010 prior to the implementation of the program, ICRs in both groups are displayed nearly parallel, indicating that there is no difference (see Figure 7). ICRs in the treatment group shows a rising trend until the first half of the 2000s, but fall down after the global financial crisis. Even after introducing the Fast-track, ICRs dramatically plunge to below the figures of the control group, but rapidly rebound since 2012. ICRs of the control group shows a similar trend to those

of the treatment group before the implementation, but continuously decrease after that.

Figure 6 shows that receivership companies spending less than six months from rehab launch to plan approval. Special banks: the Korean development bank, Export-import bank of Korea, an Industrial bank of Korea, National Agricultural Cooperative Federation, National Federation of Fisheries Cooperatives. Receivership companies' main bank is frequently changed; thus we use the data of the collecting date (late Oct. 2016). The period from the foundation date to Dec. 31, 2015. The industry is categorized by KSIC (Korea standard industry classification). C means manufacturing; F means construction; G means wholesale & retail; J means publication, image, broadcasting communications and information service; H means transportation; C14 means clothing, accessory & fur product manufacturing; C26 means electronic components, computer, image, sound & communications equipment manufacturing; C29 means other machine & equipment manufacturing; C31 means other transportation equipment manufacturing; F41 means general construction; F42 means professional construction; G46 means wholesale & commodities brokerage.

The z-score, which denotes the distance of default, shows a similar pattern in both groups before the 2011 implementation. In order to estimate the overall bank risk, previous literature (Dam and Koetter, 2012; Gropp et al., 2014; Laeven and Levine, 2009) widely use the z-score, representing the distance-to-default. $z = (ROA + CAR)/\sigma ROA$, ROA=(net profit/total assets), and CAR=(capital/total assets): σROA is the standard deviation of ROAs for three years. We apply this equation to corporate financial metrics since we believe that it is reasonable. The z-scores of the treatment and control group sharply surge until the first half of the 2000s, which means a decrease in risks; but, these scores dramatically drop from 2006 right before the global financial crisis, indicating rising risks. After introducing the Fast-track program in 2013, however, the z-score of the treatment group slightly increases, mitigating risks; while the control group score shows a downturn trend, and then turns to be a modest rise in 2015 (See Figure 7). Figure 7 indicates that receivership companies spending less than six months from the rehab launch to the plan approval.

Figure 6. Comparison of treatment and control group after Fast-track implementation
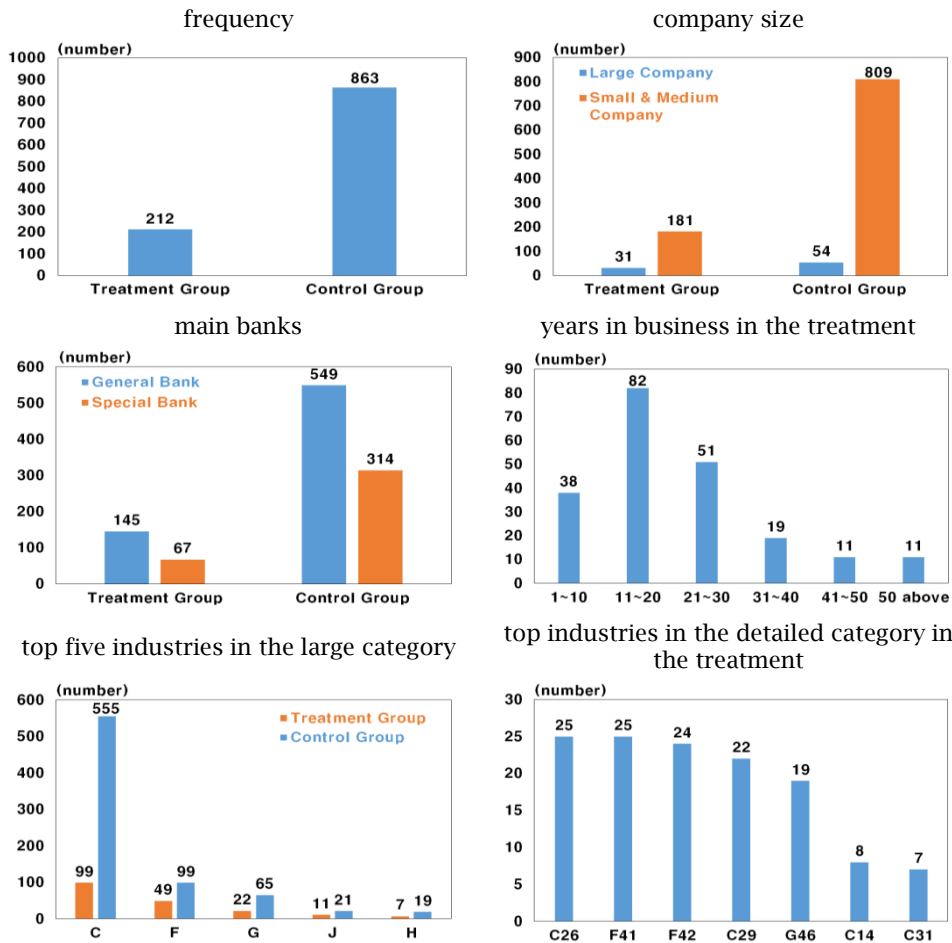
Source: KIS-Value (calculated by the author)

**Figure 7.** Parallel trend assumption of treatment and control group
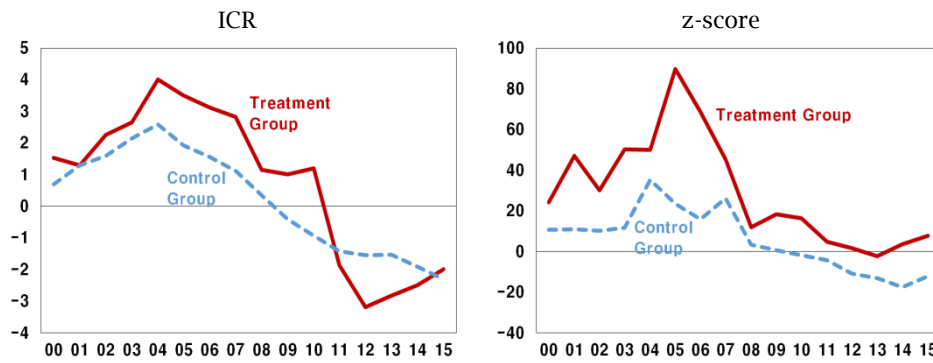
Comparing the indicators representing the probability of bankruptcy in both groups, we can find that the bankruptcy probability of the treatment group is lower than its counterpart (see Figure 8). During the global financial crisis, the following indices considerably deteriorate in the control group: profitability (operating profits/total assets), financial structure and expenses index (debts/total assets, interest expense/sales), and liquidity (net working capital/total assets). However, the control group has a larger size (in terms of total assets) than the treatment group and shows a great share of cashable assets among total assets. Likewise, in case the difference between the two groups is large, a control variable is added to the model to make the DiD model estimation as similar as possible to the experimental situation. Therefore, this paper adds the variables indicating the bankruptcy probability to the model. Meanwhile, given the point that control variables are not necessarily exogenous in estimating the DiD model, a severe bias does not seem to be found in estimated values even if multicollinearity is suspected among these variables. Indeed, there is no case of eliminating these variables from the model due to multicollinearity problem in the statistical package (Stata).

Figure 8 indicates that receivership companies spending less than six months from the rehab launch to the plan approval. Total assets are log-transformed value.

Figure 8. Comparison of treatment and control group

net working asset/total asset

cashable asset/total asset
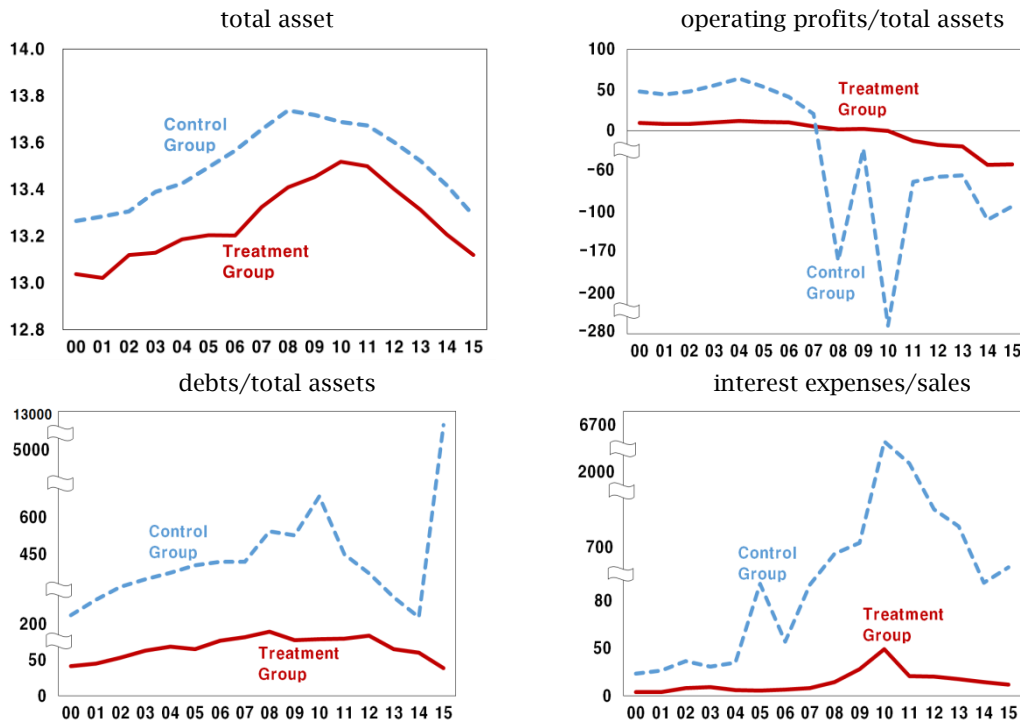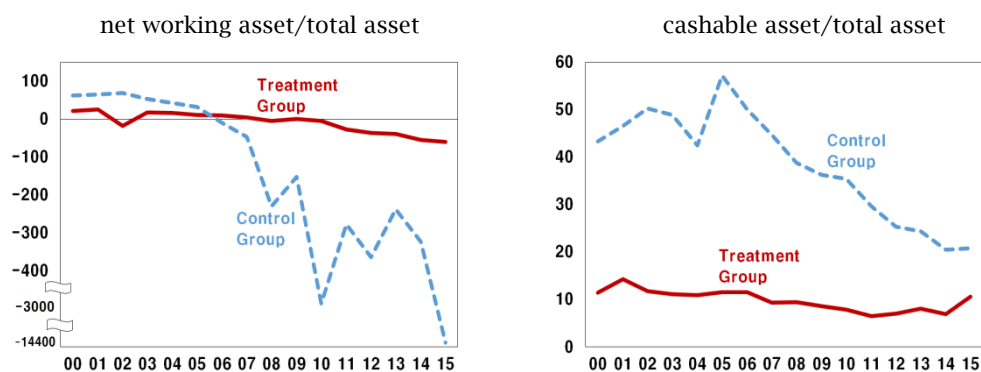
4. ANALYSIS OF THE RESULTS

We set up a model in diverse ways depending on the year-fixed effect and the existence or non-existence of control variables affecting company insolvency, while equally controlling for the company-fixed effect (See Table 6). In this research, the companies, used for the panel analysis, are not randomly extracted from the population, but the receivership corporate population itself; and thus we employ the fixed-effect. The estimation equation (1) incorporates the treatment group variable (*FT*), the variable given the value of 1 for the post implementation (*Post*), and the cross term of *FT* and *Post* (*FT × Post*) without a control variable. According to the estimation result, the cross term (*FT × Post*) is statistically significant at the 1% level.

Next, in the equation (2), incorporating a business in years, company size, and the share of main items in total sales into the above variables, the cross term (*FT × Post*) is not statistically significant, but its sign is revealed positive (+). The equation (3) is made up by adding the year fixed effect to the equation (2). This estimation result shows that the sign of the cross term (*FT × Post*) is positive (+) like equation (2), but its statistical significance is low. If the DiD model is randomly designed, the correlation between cross-term and error-term can be eliminated via the Conditional Mean Independence by adding a control variable. In general cases, however, we cannot perfectly control omitted variables, and thus, by adding a control variable, reduce standard errors. A control variable is not an omitted variable, which is perfectly okay not to have a causal relationship with a dependent variable (ICR); therefore, this paper does not explain the sign and statistical significance of a control variable.

The equation (4) and (5) additionally consider the variables affecting company insolvency: 「operating profits/total assets」, 「debts/total assets」, 「net working capital/total assets」, 「cashable assets/total assets」 and 「added values/sales」, as well as the variables of equation (3). In both equation (4) controlling only for the company-fixed effect and equation (5) controlling for the company-fixed and year-fixed effect, the sign of the cross term (*FT × Post*) is positive (+); but their statistical significance is low. Likewise, the estimation results

of all receivership companies subject to analysis, show a low significance of the cross term (*FT × Post*). The reason is that the business foundation of those companies is damaged around the time of court receivership, and even after terminating receivership, the positive effect of the policy is limited due to the stigma effect on those companies.

That is, in case a company files for rehabilitation proceedings, not only does the financial sector review the management of loans scale and an increase in loan interests, but trade companies are also very cautious about transactions with receivership company to prevent losses. Thereby, from the moment of being placed under court receivership, the business foundation of the company becomes weakened. Afterwards, even if the company swiftly comes out of court receivership via the Fast-track program, it cannot do normal business activities in finance and commerce unless it recovers its weakened business foundation. Such problems can be explained by the stigma effect and cost disadvantage effect, as known in existing theories. That is, though a company comes out of receivership, the fact that this company had financial difficulties in the past, raises concerns among market participants, leading to a lower credit rating and higher risk premiums. Eventually, the financing of this company may not be smooth. This result is commonly observed both in large and small-mid companies, as well as industries estimated in this paper (e.g. construction, wholesale and retail) (See Table 7). For reference, FSC and FSS (2017) point out that the effect of the court-led rehabilitation is limited due to several reasons: procedure delays, difficulties in securing fresh funds, and undermined external credibility.

Table 6. DiD analysis on changes in ICRs upon the Fast-track implementation

Variable	(1)	(2)	(3)	(4)	(5)	large company	Small-mid company
	ICR						
FT	-1.657***	-1.758**	-1.224	-1.506*	-0.953	-5.403*	-0.808
	(0.316)	(0.866)	(0.916)	(0.869)	(0.878)	(2.791)	(0.902)
Post	-2.697***	-1.696***	-3.731***	-1.135***	-2.507**	-0.890	-2.583**
	(0.0972)	(0.266)	(0.717)	(0.252)	(0.975)	(2.072)	(1.142)
FT × Post	0.752***	0.872	0.718	0.268	0.140	1.136	0.115
	(0.227)	(0.548)	(0.550)	(0.456)	(0.467)	(1.538)	(0.478)
size		-1.193***	-1.065***	-1.544***	-1.467***	-0.554	-1.663***
		(0.211)	(0.211)	(0.205)	(0.204)	(0.596)	(0.195)
years		-0.122***	0.0678	-0.0036	0.107*	-0.0154	0.127*
		(0.0449)	(0.0556)	(0.0456)	(0.0616)	(0.187)	(0.0688)
share of main items		-0.0102*	-0.0101*	-0.0089*	-0.0097*	-0.0044	-0.0092
		(0.006)	(0.00588)	(0.00529)	(0.00524)	(0.0137)	(0.00573)
operating profits/total assets				9.539***	9.088***	11.54***	8.361***
				(1.259)	(1.241)	(3.713)	(1.275)
debts/total assets				-2.181***	-2.244***	-3.492**	-2.080***
				(0.506)	(0.503)	(1.542)	(0.511)
net working capital/total assets				-0.587	-0.698*	-0.597	-0.753*
				(0.391)	(0.386)	(1.216)	(0.411)
cashable capital/total assets				5.875***	6.220***	8.535	5.427**
				(1.984)	(1.982)	(5.690)	(2.104)
added value/sales				-0.783	-0.821	8.412**	-1.397
				(0.933)	(0.926)	(4.190)	(0.885)
constant terms	2.063***	32.68***	27.80***	39.47***	36.21***	15.20	40.41***
	(0.023)	(4.721)	(4.741)	(4.553)	(4.553)	(14.31)	(4.345)
firm fixed effect	yes	yes	yes	yes	yes	yes	yes
year fixed effect	no	no	yes	no	yes	yes	yes
observation number	16,145	4,206	4,206	3,278	3,278	330	2,948
Group number	1,474	805	805	716	716	61	655

Note: Parenthesis is a standard error, clustered at the level of company.
***: p<0.01; ** : p<0.05; *: p<0.1

In addition, we estimate the DiD model for steel (C24), chemistry (C20) and shipbuilding of which the government recently exerts efforts to strengthen competitiveness. We select companies from shipbuilding-related manufacturing and service sectors among transportation equipment manufacturing (C31). In the case of steel and shipbuilding, the statistical significance of the Fast-track introduction is low; but as for chemistry, we gain a statistically significant outcome. Steel companies have difficulties in enhancing competitiveness even after terminating court receivership; since global oversupply continues due to the sluggish demand for steel products (e.g. in China), and the competition between local companies becomes fiercer due to the extension of imports from China. Therefore, the effect of the program is only meager. In the case of shipbuilding, small-mid sized shipbuilding companies have suffered from reduced orders of their main items (e.g. bulk carriers: vessels only for cargo, small-mid sized tanker ships: carrying fluid cargo); and from

competitions with Chinese firms for low-priced orders, which is induced by the global trade slump since the global financial crisis. As a result, most of the small-mid sized shipbuilding companies have gone into court receivership or been shut down. Even if they are subject to the Fast-track program, rehabilitation is not easy once their management conditions deteriorate. Meanwhile, chemistry shows a positive sign (+) at the 10% significance level, indicating that the introduction of the Fast-track program positively affects the rehabilitation of this industry. That is, after implementing this program, the ICR of the companies having gone through the Fast-track program, increases by 1.894. Compared to other countries, Korea has a considerable competitiveness in terms of economic scale, the concentrated level of relevant industrial complex and energy efficiency. Thus, despite the global economic slump, it can raise the degree of rehabilitation owing to the Fast-track program.

Table 7. DiD analysis on changes in ICRs upon the Fast-track implementation

Variables	Manu-facturing	Construc-tion	Retail/ Wholesale	Steel	Chemistry	Ship-building
	ICR					
FT	0.382	-4.501***	2.586***	-0.282	-1.376	3.589**
	(1.107)	(0.899)	(0.749)	(0.930)	(1.104)	(1.500)
Post	-2.904***	-7.800***	-0.268	-2.763	-4.156*	4.526***
	(1.001)	(2.221)	(5.168)	(1.963)	(2.152)	(1.339)
FT × Post	-0.588	1.045	0.932	-0.697	1.894*	1.209
	(0.672)	(1.128)	(1.715)	(1.538)	(0.987)	(1.285)
size	-1.457***	-1.631***	-0.543	-0.816	-1.859***	-1.291*
	(0.235)	(0.527)	(0.805)	(0.504)	(0.439)	(0.626)
years	0.150**	0.0978	-0.131	0.442***	0.241	-0.383***
	(0.0696)	(0.113)	(0.386)	(0.156)	(0.162)	(0.108)
main-item share	-0.0129**	-0.0130				
	(0.0057)	(0.0170)				
operating profits/total assets	10.16***	1.410	-0.850	8.053*	11.47***	12.18**
	(1.371)	(3.654)	(6.848)	(4.107)	(2.823)	(4.020)
debts/total assets	-1.960***	-2.985**	-2.401	-2.437*	0.802	1.745
	(0.534)	(1.306)	(2.095)	(1.381)	(1.258)	(2.452)
net working capital/total assets	-0.864**	0.815	0.0688	0.793	-0.691	0.581
	(0.424)	(1.027)	(1.888)	(0.941)	(0.982)	(1.554)
cachable assets/total assets	7.486***	1.268	10.84*	6.572	8.883	
	(2.324)	(4.142)	(5.946)	(7.179)	(6.014)	
added value/sales	-0.886	0.0488	11.02	-0.0966		
	(1.093)	(2.042)	(7.837)	(1.859)		
constant term	35.65***	41.17***	14.85	17.89	41.03***	31.38*
	(5.164)	(12.05)	(18.49)	(11.14)	(9.932)	(14.66)
firm fixed effect	yes	yes	yes	yes	yes	yes
year fixed effect	yes	yes	yes	yes	yes	yes
observation index	2,300	687	194	227	281	116
Group number	495	142	41	36	28	10

Note: Parenthesis is a standard error, clustered at the level of company.
***: $p<0.01$; ** : $p<0.05$; *: $p<0.1$

5. SUMMARY AND IMPLICATIONS

The work-out system, which was actively applied during the Asian financial crisis, has shown limitations on corporate restructuring in normal times due to environmental changes. Meanwhile, the Integrated Insolvency Act (Apr. 2006), enacted by the IMF requirement after the Asian financial crisis, has become a more important restructuring method by improving rehabilitation proceedings. This paper examines what effect the Fast-track program has on corporate rehabilitation using the DiD method, given the fact that a swift rehabilitation procedure is very critical.

According to the analysis result, the Fast-track program positively affects the improvement in ICRs, deemed a measurement of rehabilitation; but its statistical significance is low. We gain the same result in estimations by company size (large, small-mid companies) and by industry (manufacturing, construction, and wholesale & retail). Such outcome may be due to the limitation of the positive effect of the program. Receivership companies usually suffer from the bankruptcy stigma as well as weakened business foundation induced by the financial sector's loan management and the severance of transactions with business partners around the time of receivership.

Meanwhile, we analyze the effect of the Fast-track on the receivership companies of which the government has recently carried out restructuring, in the sector of steel, chemistry, and shipbuilding. The result shows that the statistical significance is low except for chemistry. In the case of chemistry, the competitiveness of local companies is high, and thus they can increase the degree of rehabilitation owing to the Fast-track program. However, as for steel and shipbuilding, the effect of the program seems to be limited due to the weakened industrial competitiveness centering on small-mid companies.

This analysis result suggests following implications. First, in a bid to improve the rehabilitation effect of the Fast-track, institutional efforts are needed to alleviate restricting factors, such as falling credit rating and high-risk premiums induced by the stigma effect. Next, when the industrial competitiveness remains weak despite the implementation of the Fast-track, as observed in the empirical analysis result of steel and shipbuilding, the effect of the Fast-track implementation may be limited; thus, in this case, restructuring efforts are critical such as business reorganization. If these issues are resolved, the Fast-track can be successfully settled, and the effect of this program will is gradually presented. Last, as the court does not officially report the list of receivership companies, we set up the treatment group (subject to the Fast-track) with companies whose period from the date of deciding rehabilitation launch to the date of approving the rehabilitation plan is less than six months. Thereby, the possibility of measurement errors could be the limitation of this research.

REFERENCES

1. Bruton, G. D., Kay K., & Scifres, E. L. (2002). Corporate Restructuring and Performance: An Agency Perspective on the Complete Buyout Cycle, *Journal of Business Research, 55,* 709-724. https://doi.org/10.1016/S0148-2963(00)00212-5
2. Card, D. (1990). The Impact of the Mariel Boatlift on the Miami Labor Market. *Industrial and Labor Relations Review, 43(2)*, 245-257. https://doi.org/10.1177/001979399004300205
3. Card, D., & Krueger, A. B. (1994). Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania. *The American Economic Review, 84(4)*, 772-793.
4. Dam, L. and M. Koetter (2012). Bank Bailouts and Moral Hazard: Evidence from Germany, *Rev. Finance. Stud. 25(8)*, 2343-2380. https://doi.org/10.1093/rfs/hhs056
5. Gilson, S. (1997). Transactions Costs and Capital Structure Choice: Evidence from financially Distressed firms. *Journal of Finance, 52.* https://doi.org/10.1111/j.1540-6261.1997.tb03812.x
6. Gropp, R., Gruendl, C., & Guettler, A. (2014). The Impact of Public Guarantees on Bank Risk-taking: Evidence from a Natural Experiment. *Rev. Finance 18(4).* https://doi.org/10.1093/rof/rft014
7. Heckman, J., (1979). Sample Selection Bias as a Specification Error. *Econometrica, 47,* 153-61. https://doi.org/10.2307/1912352
8. HM Government (2009). New Industry, New Jobs: Building Britain's Future. Retrieved from http://webarchive.nationalarchives.gov.uk/+/http:/www.bis.gov.uk/files/file51023.pdf.
9. Ignatowski, M., & Korte, J. (2014). Wishful Thinking or Effective Threat? Tightening Bank Resolution Regimes and Bank Risk-taking. *Journal of financial Stability 15*, 264-284. https://doi.org/10.1016/j.jfs.2014.05.002
10. Kang, D. (2004). Determinant Factors of Success in Work-out, KDI Research Report KDI.
11. Kang, J. M. (2007). .Current Status and Issues of Private Equity Fund (PEF). BOK Working Paper, BOK.
12. Kang, J.-K., & Shivdasani, A. (1997). Corporate Restructuring During Performance Declines in Japan, *Journal of Financial Economics 46*, 29-65. https://doi.org/10.1016/S0304-405X(97)00024-X
13. Kim, J. K. (2004). Causes of the Asian Financial Crisis & Assessment of Corporate Restructuring. KDI Research Report, KDI.
14. Kim, S.-J. (2004). Macro Effects of Corporate Restructuring in Japan. IMF Staff Papers, 51(3).
15. Laeven, L., & Levine, R. (2009). Bank Governance, Regulation and Risk Taking. *J. Financ. Econ. 93(2),* 259-275. https://doi.org/10.1016/j.jfineco.2008.09.003
16. Lee, C. (2014). In Utero Exposure to the Korean War and Its Long-term Effects on Socioeconomic and Health Outcomes. *Journal of Health Economics, 33*, 76-93. https://doi.org/10.1016/j.jhealeco.2013.11.002
17. Moon, H. J. (2013). The Integrated Insolvency Act, Bobnyul Publishing Company.

18. Park, Y. (2016). Current Status of Korean PEF & its Role in Corporate Restructuring. Seminar materials, Korean Capital Market Institute.
19. Rodrik, D. (2004). Industrial Policy for the Twenty-First Century. John F. Kennedy School of Government, Havard University, September.
20. Shin, D. R. (2005). Research on Financial Characteristics of Insolvent Companies and Insolvency Prediction Model. Korean Accounting Information Association. *Accounting Information Review*, 23(2), 137-165.
21. Shin, D. R. (2006). Research on the Usefulness of Productivity Index in Estimating Corporate insolvency. Productivity Review, 20(2).
22. Shin, J. (2017). Corporate Restructuring and Its Macro Effects. IMF Working Paper, WP/17/17.
23. Smart, S. B., & Waldfogel, J. (1994). Measuring the Effect of Restructuring on Corporate Performance: The Case of Management Buyouts. *The Review of Economics and Statistics, 76(3),* 503-511. https://doi.org/10.2307/2109975
24. Stock, J. H., & Watson, M. W. (2011). Introduction to Econometrics Third Edition, Addison-Wesley.
25. World Bank (1999). Symposium on Building Effective Insolvency Systems, World Bank.
26. Yoo, H. Y. (2011). Explanation Material for the Fast-track Corporate Rehabilitation Procedure, the Bankruptcy Division of the Seoul Central District Court.