

## The Analysis on the Basic Assets Determinants of Credit Guarantee Organizations Using Panel Data

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### Abstract

*As a result of an empirical analysis of the fixed effect model, the following results have been drawn in this study: First, guarantee balance has a positive impact on the basic asset. As guarantee balance increases, the basic asset increases. Second, guarantee supply has a negative impact on the basic asset. As guarantee increases, the basic asset decreases. Third, the number of bankrupt companies and unemployment rate are estimated to have a positive impact on the basic asset. As the number of bankrupt companies and unemployment rate increase, demand for guarantee becomes higher, and therefore basic asset should be procured more. Lastly, this study did not identify the impacts of subrogation and dishonored ratio of checks and bills on the basic asset. Since basic asset has a character of the reserve fund of subrogation, the relation of the two variables is expected to have a negative relation. Although the sign is negative, no significance is found statistically. This study examined what variables affect the expansion of basic asset that becomes the basis of credit guarantee. For analysis, this study conducted a panel regression analysis with the panel data of three types of credit guarantee organizations: Credit guarantee fund, technology guarantee fund and regional credit guarantee foundations [1].*

**Keywords:** *Credit Guarantee Organization, Basic Asset, Panel Regression, Fixed Effects Model*

### 1. Introduction

Nobody will reject the fact that small and medium-sized enterprises (SMEs) constitute the basis of the Korean economy. The ratio of SMEs out of total businesses in 2013 was a whopping 99.9%, and the workers of SMEs accounted for 87.5% of total employment. According to the Korea Federation of Small and Medium Business, the SMEs' output and added value continuously increase, and the output contribution rate of SMEs in the manufacturing industry at 52.9% surpassed that of large companies at 47.1%. SMEs showed more than two times higher at 69.7% than large companies at 30.3% in the contribution rate of manufacturing industry's added value. Although the status of SMEs goes up, they still suffer from difficulties in fund procurement in the financial loan market revealing conservative loan practice, focused on security. Also credit rationing in which the SMEs with technological prowess and high growth possibility cannot receive required loans occurs, because of asymmetric information.

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To solve such problems of SMEs, the government operates a credit guarantee system by which credit guarantee for SMEs is offered so that SMEs can receive loans from financial institutions. Since the credit guarantee reserve system was adopted for financial policy for SMEs in 1961, the Korea Credit Guarantee Fund(KODIT) was established in 1976. Therefore an independent agency has been carrying out credit guarantee for SMEs. The Korea Technology Finance Corporation(KOTEC) was established in 1989 to ease the fund situation of SMEs with outstanding technological prowess, and has been in operation until now. From 1996 to 2003, the Regional Credit Guarantee Foundation(RCGF) was founded in 16 cities and provinces to bolster guarantee support for micro enterprises and small owner-operators in provincial areas in an effort to ease fund situation of SMEs with excellent technological prowess.

Regarding the credit guarantee system, when an SME suffering from financial difficulties applies for a loan to a financial institution and credit guarantee organization, the credit guarantee organization issues a certificate of credit guarantee to the SME through credit inquiry and guarantee screening. A financial institution irons out financial accommodation of an SME by executing loans to SMEs based on the certificate of credit guarantee of a credit guarantee organization. The reason why such a credit guarantee system ironing out financial accommodation of SMEs is operated is that the system is based on the basic asset procured in the guarantee organization. Basic asset refers to the sum of contributions, which were received from the government, local governments and financial companies, and the earned surplus, which is business performance, that a credit guarantee organization has. The operation<sup>1</sup> within 20 times of the basic asset that a guarantee organization has is possible in terms of credit guarantee operation size.

The procurement of the basic asset of a credit guarantee organization is specified in the relevant laws, and carries legal binding force. The contribution limits of financial institutions are as follows: 0.225% (KODIT), 0.135% (KOTEC), 0.02% (RCGF). The government's contributions affect the basic asset procurement within the scope that government's discretionary power allows.

This study grasps what variables affect the expansion of basic asset, which becomes the base of credit guarantee, although basic asset procurement is specified in the laws. Through this, this study presents more useful variables for securing of basic asset finances of a credit guarantee organization [1].

This study carries out a panel regression analysis by building panel data of the three organizations: KODIT, KOTEC and RCGF. The panel data has an advantage that additional information that cannot be characterized with only a time series analysis and a cross-sectional analysis can be acquired [1].

This study is constructed as follows: Chapter I is Introduction, Chapter II explains credit guarantee organizations, and examines the existing studies on the basic asset and panel analysis. Chapter III briefly describes study data and the research model. Chapter IV presents result values through an empirical analysis, and Chapter V draws policy implications.

## **2. Understanding of Credit Guarantee Organizations and Previous Studies**

### **2.1. Credit Guarantee Organizations**

SMEs have structural problems such as high transaction cost, asymmetric information according to the lack of information, and financial practices, focused on security, in terms

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<sup>1</sup> Gearing ratio is indicated as guarantee balance vs. basic asset, and it means the available size of guarantee support through basic asset's multiplier effects, and is an indicator indicating additional guarantee support ability in the future within the gearing ratio limit.

of financial procurement. Therefore, a need to complement SMEs' financial constraints at the policy level, rather than leaving SMEs' financial problems to market mechanism, emerges. For this reason, the credit guarantee system has been adopted as a policy means to solve financial problems that SMEs have [2].

The government currently operates three types of guarantee organizations. There are KODIT and KOTEC operated by the government and RCGFs operated by local governments. Although these three types of organizations carry out credit guarantee for SMEs basically, they show difference in finances procurement. KODIT and KOTEC are supervised by the Financial Service Commission, and RCGFs are supervised by local governments and Small and Medium Business Administration (SMBA). The finances procurement of KODIT and KOTEC is done by the government and financial institutions, and that of RCGFs is conducted through the government, local governments and financial institutions [3,1].

**Table 1. Status of Credit Guarantee Organizations [1]**

Classification	KODIT	KOTEC	RCGF
Establishment basis	Korea CREDIT GUARANTEE FUND ACT	KOREA TECHNOLOGY CREDIT GUARANTEE FUND ACT	REGIONAL CREDIT GUARANTEE FOUNDATION ACT
Establishment date	June 1976	April 1989	1996 ~ 2003
Establishment goal	Liabilities guarantee of companies with weak security capacity	Ironing out of fund supply for new technology business	Small companies with weak security capacity •Liabilities guarantee of micro enterprises, etc.
Operator	Central government	Central government	Metropolitan local government
Procurement of finances	Government, financial institution	Government, financial institution	Local government, financial institution
Job supervision	Financial Service Commission	Financial Service Commission	SMBA, local government
Securing budget	SMBA	SMBA	SMBA, local government
Guarantee limit	KRW 3 billion	KRW 3 billion	KRW 800 million
Targeted company	SME	Technology innovation company (venture, INNO-BIZ)	Small companies • Micro enterprises (Non-store • including unregistered business operators)
Guarantee fees	0.5% ~ 3.0%	0.5% ~ 3.0%	0.5% ~ 2.0%
Guarantee type	Partial guarantee	Partial guarantee	Partial guarantee

Note: KOREAN FEDERATION OF CREDIT GUARANTEE FOUNDATIONS, 2014 Report of Analysis on Credit Guarantee Support Effects on Small Businesses and Micro Enterprises, Re-processed in 2014 [3].

As of the end of 2014, total guarantee balance was KRW 74.8 trillion: KODIT

accounted for 55% of the total guarantee balance or KRW 41.2 trillion. KOTEC accounted for 25.6% or KRW 19.2 trillion, and RCGFs accounted for 19.3% or KRW 14.4 trillion. Basic asset becomes the basis of credit guarantee. Basic asset becomes the ultimate security of guaranteed liabilities, and has the function of subrogation money incurred through guarantee at the same time. As for basic asset procurement, the contributions rate is legally limited for financial institutions, but government contributions can be determined within the scope of discretionary power. Namely, the government sets up guarantee size, calculates income and expenditure sizes, and then determines proper operation gearing ratio, and liquidity size through government budget's balance analysis. In this manner, government contributions are calculated. The formation of basic asset is affected by how guarantee size is set up.

Currently, studies on the basic asset of credit guarantee organizations are minimal, and the studies on the size of credit guarantee are also insufficient. Interdisciplinary discussions and studies have not been active, because guarantee finances could be stably supplied by government's will, as the basic asset is specified in laws. Rather, studies on the operation performance, ripple effects, relations with economic variability and efficiency of the credit guarantee system can be found more.

Nonetheless, Jeong (2005) presented the development direction of credit guarantee through basic asset expansion through a study, and pointed out the problems of the basic asset[4]. Jeong asserted a method of differentiation by adjusting the contributions rate of a financial institution with high subrogation rate upward, since the most important factor determining the contributions rate is the average rate of subrogation, if the amount corresponding to a certain rate of loan amount for guarantee requested by each bank to a credit guarantee organization is calculated. Also, he asserted that contribution-targeted financial institutions should be expanded including contributions of the secondary financial institutions, while gradually adjusting financial institutions' contributions rates downward. The study of Jung has significance to unfold discussions on the basic asset from the position of KODIT among the three types of credit guarantee organizations.

Hong *et al.*(2005) conducted a regression analysis using time series data through research on proper size of credit guarantee supply calculation, insisting that the credit guarantee size should be flexibly operated according to economic variation within the scope of 2.0~2.2% in terms of the rate of guarantee balance vs. GDP through a micro-analysis[5].

IMF (2005) evaluated Korean guarantee size was higher than those of foreign countries using the guarantee size indicator vs. GDP [6].

Lee *et al.* (2006) conducted an empirical analysis by using time series data for the factors determining credit guarantee funds' proper guarantee size. As a result of the analysis, they announced national income, square national income and the dishonored ratio of checks and bills were statistically significant. Especially, the estimation coefficient of square national income was estimated to be negative, and thus they said the size of credit guarantee is on the decline naturally, if national income increases [7].

Yun (2014) recently estimated the guarantee size of credit guarantee organizations in consideration of national economic size change, various macro-economic indicators and financial institutions' loan size, and reported the estimated potential guarantee demand of micro enterprises [8].

Yun (2015) carried out theoretical examination and an empirical analysis on the correlation between the RCGF's guarantee supply size and proper contributions size according to subrogation rate for financial stability review of RCGFs. According to the analysis result, the contribution level of RCGF's is at insufficient level to cope with the guarantee supply expansion policy on information for each region's small companies and micro enterprises, and high subrogation size. He asserted support organization's contributions should be expanded for RCGF's stable guarantee supply, and an effort for risk control needs to be strengthened for subrogation reduction [9].

## 2.2. Panel Regression Analysis

Panel data has a merit in that additional information can be acquired with just a time series analysis or a cross-sectional analysis, as well as cross-sectional data information[8]. A panel data analysis can control the time effect or individual effect that cannot be controlled by a time series analysis or a cross-sectional analysis. Panel data analysis enables to reduce the problem of multicollinearity, and makes the analysis easy by offering more degree of freedom and variability. The panel data analysis also makes adjustment's dynamics and verification possible by building a complex type model.

This study tried a panel regression analysis by building the individual time series data of three types of the credit guarantee organizations using such merits. The panel regression analysis assumes that error term's homo-scedasticity, contemporaneous correlation, and autocorrelation do not exist, and also assumes the exogenous attributes of explanatory variables by using ordinary least squares method(OLS). General panel regression model's basic equation is as follows:

$$Y_{it} = \alpha + \beta X_{it} + u_{it} \quad (1)$$

Where,  $i$  refers to individual panel of cross-sectional data,  $t$  indicates time variable.  $Y_{it}$  indicates dependent variables,  $X_{it}$  indicates independent variables, and  $u_{it}$  is the error term. The error term consists of  $\gamma_i + \varepsilon_{it}$ , and  $\gamma_i$  shows the individual panel's characteristics effect that is not observed.  $\varepsilon_{it}$  Means net error term changing according to time and individual panel.

Generally, the panel regression analysis can use FE(fixed effects) model, RE(random effects) model. The FE model assumes that unique characteristic effect has the correlation with explanatory variables of individual panel, since individual panel's unique characteristics effect is included in the error term. The RE model assumes that there is the correlation between unique characteristics effect and explanatory variables, since the difference of individual panel is a random variable, and thus it is included as part of error term. Verification on which model is more appropriate is determined through the Hausman test. The Hausman test<sup>2</sup> judges that the random effects model is more efficient, if null hypothesis is selected, and the fixed effects model is more efficient, if null hypothesis is rejected.

Although studies on a panel analysis using the advantages of panel data are reported recently, any study by building the data of three types of credit guarantee organizations, namely, KODIT, KOTEC and RCGF as panel data, has yet to be reported. This study is the panel analysis attempted in this regard for the first time, and has differentiation from the other studies related with credit guarantee.

## 3. Research Model

<sup>2</sup> The null hypothesis ( $H_0$ ) is  $\text{cov}(x_{it}, u_i) = 0$ , alternative hypothesis ( $H_1$ ) is  $\text{cov}(x_{it}, u_i) \neq 0$ . Namely, the FE and RE are both consistent estimators in the null hypothesis, but the random effects are the more efficient estimator than the fixed effects. In the alternative hypothesis, the fixed effects are the consistent estimator, and the random effects are not the consistent estimator.

$H = (\hat{\beta}_{FE} - \hat{\beta}_{RE})' [\text{var}(\hat{\beta}_{FE}) - \text{var}(\hat{\beta}_{RE})]^{-1} (\hat{\beta}_{FE} - \hat{\beta}_{RE})$  is the test statistic (H) of the Hausman test, and follows the chi-squared ( $\chi^2$ ) distribution.

### 3.1. Data Collection and Sample Construct

The data used in this study is the monthly guarantee data of KODIT, KOTEC and RCGFs from January 2008 to the end of December 2014. The relevant data was extracted from the monthly guarantee journal of the KOREAN FEDERATION OF CREDIT GUARANTEE FOUNDATIONS. The basic asset, a used dependent variable, is the summed value of contributions and earned surpluses of the government (local governments), and financial institutions of the three types of the guarantee organizations. For credit guarantee organization's internal independent variables, this study used the data of guarantee balance, guarantee supply money and subrogation money data. All these were used for the analysis, since they were judged to be variables from the supply aspect from the position of basic asset. Concerning the external independent variables, the dishonored ratio of checks and bills, number of bankrupt companies, and unemployment rate were used as the data released by the Bank of Korea. Such variables are judged to be the variables from the demand aspect from the position of basic asset.

As for panel variables, Basic is the basic asset of a guarantee organization, GAMM is guarantee balance, GSM guarantee supply money, NSBM subrogation money, DRA default rate, DCC the number of bankrupt companies and NWR unemployment rate as shown in Table 2.

**Table 2. Basic Statistics of Panel Variables**

Classification	Mean value	Maximum value	Minimum value	Standard deviation	Variable name
lnBasicC	10.27	10.92	9.61	0.37	Basic asset
lnGAMM	12.16	12.95	10.74	0.56	Guarantee balance
lnGSM	9.44	11.32	7.47	0.83	Guarantee supply
lnNSBM	6.16	7.55	3.00	0.82	Subrogation
DRA	0.14	0.30	0.04	0.05	Dishonored ratio of checks and bills(%)
lnDCC	4.76	5.84	4.06	0.40	No. of bankrupt companies
lnNWR	1.22	1.61	0.99	0.13	Unemployment rate

The observed number of the variables' common panel data to be used in the empirical analysis in this study was 252 as monthly data for seven years of the three types of guarantee organizations, and natural log values were used for the remaining variables except default rate.

### 3.2. Analysis Model

As the analysis model in this study, this study finds the variables affecting basic asset,

a dependent variable, by constructing panel multiple regression as shown in Equation (2) [1]. After removing unit root on the variables in which panel unit root exists, this study established Equation (3) in order to reduce a spurious relation of the panel regression analysis by carrying out the panel unit root test of panel variables in equation (3). This study estimates the ultimate function equation as shown in equation (3) by setting up difference type using delta ( $\Delta$ ), a difference operator, through the panel unit root test as shown in Table 3.

$$\ln BasicC_{it} = \alpha + \beta_1 \ln GAMM_{it} + \beta_2 \ln GSM_{it} + \beta_3 \ln NSBM_{it} + \beta_4 DRA_{it} + \beta_5 \ln DCC_{it} + \beta_6 \ln NWR_{it} + v_{it} \quad (2)$$

$$\Delta \ln BasicC_{it} = \alpha + \beta_1 \ln GAMM_{it} + \beta_2 \ln GSM_{it} + \beta_3 \ln NSBM_{it} + \beta_4 DRA_{it} + \beta_5 \Delta \ln DCC_{it} + \beta_6 \ln NWR_{it} + v_{it} \quad (3)$$

$i$  = CGF, TGF, RCGF,  $t$  = Jan. 2008 ~ Dec. 2014

## 4. Empirical Analysis

### 4.1. Result of Panel Unit Root Test

In the time series data, the unit root test is an important method to identify data stability. When a regression analysis is conducted with a variable having unit root in the time series data, a possibility that there can be a spurious relation is high [10]. In an analysis using panel data, Balti(2001) said a spurious relation occurs like there is a correlation, even though there is no actual relation, if one variable is not stationary at least [11]. Generally, the unit root test in the ADF(Augmented Dickey-Fuller) method and PP(Phillips-Peron) method is carried out. This is to test the existence of unit root. If it is rejected within significance level of 0.01~0.1, the data becomes stationary data without the unit root. If a unit root exists, the unit root is removed through difference. The panel unit root test is a fused form of cross-sectional and time series data, and therefore it is divided into a test assuming common unit root process between cross-section individual data and a test testing individual unit root process. Levin, Lin & Chu (2002), Bruiting (2000) and Hardy (2000) researched the panel unit root test of common unit root process [12-13]. I'm, per ran and Shin (2003), Mandala & Wu (1999) reported the panel unit root test in the individual unit root process through Fisher-ADF and Fisher-PP test methods [14-15]. Recent studies report that test capacity of the panel unit root test is more powerful than the traditional unit root test including the improvement of limited sample test, compared to time series or cross-sectional data.

Before the estimation in this study, the unit root test of panel variables was conducted. The panel unit root test used Levin, Lin & Chu(LLC) of common unit root process, and I'm, per run and Shin(IPS) of individual unit root test process and the Fisher-ADF and Fisher-PP test methods.

As a result of the tests, the panel unit root existed in the level variable - the number of bankrupt companies - as shown in Table 1, but unit root did not exist as a result of difference. Although no unit root existed in the three tests of LLC, IPS and ADF in terms of level variable of basic asset, the unit root existed as a result of the Fisher-PP test. In the basic asset's difference variable, no unit root existed in the four panel unit root tests. Besides, no unit root existed in the level variable in terms of use variables. Therefore this study analyzed by setting up Equation (3) as the ultimate function equation using the difference variable in terms of basic asset and the number of bankrupt companies, and the level variable for others [1].

**Table 3. Panel Unit Root Tests**

Variable		Assumption of common root	Assumption of individual root		
		LLC	IPS W-stat	ADF	Fisher-PP
		t-Stat.	t-Stat.	t-Stat.	t-Stat.
lnBasicC	Level	-3.35***	-2.02**	13.73**	10.58
	Difference	-6.28***	-6.81***	54.25***	95.80***
lnGAMM	Level	-4.58***	-3.03***	20.12***	19.41***
lnGSM	Level	-6.91***	-9.93***	81.26***	76.36***
lnNSBM	Level	-3.65***	-6.92***	58.00***	73.67***
DRA	Level	-6.32***	-5.18***	38.70***	69.96***
lnDCC	level	0.19	0.17	3.49	4.52
	Difference	-1.75**	-14.79***	95.23***	55.26***
lnNWR	lLevel	-7.08***	-6.43***	51.57***	27.46***

Note: Statistically significant at the significance levels of \*\*\* 1% and \*\* 5%.

#### 4.2. Result of Panel Regression Analysis

Because the heterogeneity of each credit guarantee organization cannot be controlled by explanatory variables in the panel regression analysis of this study, the ordinary least squares method (OLS) cannot be a consistent estimator. To identify the characteristics of individual effect not observed, the pooled-LS, fixed effects model and random effects model were used in this study. Table 4 shows the results of the panel regression analysis drawn by using the estimated function equation in equation (3). This study conducted a Hausman test to select the optimum model among the statistics of the fixed effects model and random effects model. As shown in Table 5, the Hausman test result shown in the following: chi-squared statistic was 24.629, and significance probability was 0.000. Therefore, the null hypothesis, “Although the fixed effects and random effects are both consistent estimators, the random effects are more efficient estimator than the fixed effects ( $H_0 : cov(x_{it}, u_i) = 0$ ),” is rejected. In this regard, the fixed effects model can be the optimum model as the model in this study.

**Table 4. Results of Basic Asset Determinant Factors of Credit Guarantee Organizations Using Panel Models [1]**

Classification	PLS Model	Fixed Effects Model	Random Effects Model
	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
Intercept		-0.086(-6.199)***	-0.081(-5.386)***
lnGAMM	0.309(7.874)***	0.225(5.753)***	0.221(6.323)***
lnGSM	-0.811(-23.376)***	-0.797(-24.588)***	-0.818(27.741)***
lnNSBM	-0.001(-0.588)	-0.001(-1.003)	-0.001(-1.153)
DRA	-0.023(-0.718)	-0.037(-1.228)	-0.012(0.418)
$\Delta$ lnDCC	-0.004(2.586)***	0.015(6.616)***	0.015(5.683)***
lnNWR	-0.011(-1.764)*	0.015(2.207)***	0.015(2.106)***
$R^2$	0.702	0.746	0.763
$\overline{R^2}$	0.696	0.737	0.757
F-statistic		88.137***	129.796***
Durbin-Watson	1.337	1.390	1.493
Log-likelihood	696.744	716.486	-
Akaike info. Criterion	-5.548	-5.682	-

Note: Statistically significant at the significance levels of \*\*\* 1%, \*\* 5% and \* 10%.

As a result of the empirical analysis of the fixed effects model: First, guarantee balance affected a positive impact on the basic asset. if guarantee balance increases, basic asset does not increase. Basic asset increases, if gearing ratio is constant, since guarantee balance size is formed on the basis of basic asset, and the gearing ratio becomes the inverse relation between the basic asset and guarantee balance. Second, guarantee supply has a negative impact on basic asset. As guarantee supply increases, basic asset decreases, and if guarantee supply decreases, the basic asset increases. Third, the impacts of subrogation and default rate on basic asset was not identified. What is special is that this study did not identify the relation between subrogation and basic asset. If basic asset is a fund for guarantee supply and a simultaneously reserve fund for subrogation, there is an expectation that there will be an impact on basic asset, as subrogation is higher or lower. However, such a relation was not grasped in this study. The number of bankrupt companies and unemployment rate indicators seem to have more impacts on the basic asset procurement of a guarantee organization. Unemployment rate refers to the rate that job was not acquired within the economically active population. When lots of unemployed people occur, due to corporate restructuring during the foreign exchange crisis in the past, SOHO startups with small capital boomed, or venture business startups

boomed with venture business fostering policy once. Therefore government's guarantee size also increased<sup>3</sup>, as startups were induced in such situation that job seeking need was not solved in the labor market structurally upon unemployment occurrence. The increase of unemployment is said to mean the increase of basic asset in the situation that the guarantee size increase is coupled with the increase of basic asset.

The basic asset, which is the guarantee financial source of the three types of guarantee organizations, should be procured rationally in consideration of the variables affecting the basic asset procurement. Especially, the basic asset of the guarantee organizations should be procured by carefully watching the movements of guarantee balance, guarantee supply, the number of bankrupt companies and unemployment rate variables.

**Table 5. Result of Hausman Test**

Classification	Result
H0	$H_0 : cov(x_{it}, u_i) = 0$
H1	$H_1 : cov(x_{it}, u_i) \neq 0$
Chi-Sq. Statistic	24.629
Chi-Sq. d.f	6
Prob.	0.000

## 5. Conclusion

This study delved into what variables affected the expansion of basic asset, which becomes the basis of credit guarantee, although the basic asset procurement of a credit guarantee organization is specified in laws. Through this, this study presented the variables more useful for the acquisition of basic assets of credit guarantee organizations. As an analysis method, this study conducted a panel regression analysis by building panel data on the three types of guarantee organizations: KODIT, KOTEC and RCGF. The panel data has an advantage that additional information that cannot be identified through only time series analysis and cross-sectional analysis can be acquired. The ordinary least squares (OLS) method cannot be a consistent estimator, because the heterogeneity of each type of credit guarantee organization cannot be controlled by explanatory variables in the panel regression analysis of this study. Therefore this study used a fixed effects model and a random effects model to grasp the characteristics that unobserved individual effects has. To select the optimum model, this study conducted the Hausman test. Consequently, the fixed effects model was selected as the optimum model. As the empirical analysis result of the fixed effects model, the following were identified: First, guarantee balance has a positive impact on the basic asset. As guarantee balance increases, the basic asset also increases. Namely, the basic asset increases, as guarantee balance increases, when the gearing ratio is constant. This means the basic asset, which is the financial source of credit guarantee, should be expanded for guarantee balance increase. Second, guarantee supply has a negative impact on the basic asset. As guarantee supply increases, the basic asset decreases. Third, the number of bankrupt companies and unemployment rate has a positive impact on the basic asset. As the number of bankrupt companies and

<sup>3</sup> Noh (2009) reported that policy level credit guarantee such as P-CBO guarantee, guarantee for micro startup businesses and guarantee support consolidation of manufacturing-related wholesale and retail and knowledge-based service industry rapidly increased as part of overcoming the foreign exchange crisis and solution to SMEs' credit crunch since 1998. The guarantee balance size decreased gradually from 2005, due to economic recovery in 2002. He said credit guarantee supply turned into an increasing trend because of global financial crisis in the second half of 2008[16].

unemployment rate increase, the demand for guarantee becomes higher, and thus more basic asset should be procured. Lastly, this study did not identify the impact of subrogation and default rate on the basic asset. Since basic asset has a character of the reserve fund of subrogation, the relation is expected to be a negative relation, but it is just a prediction, and there is no statistical significance.

This study has a huge meaning in that this study analyzed by constructing the panel data of Korea's three types of guarantee organizations. This study also presents policy implications on what variables need to be considered for basic asset procurement and expansion. At the policy level, KODIT offers credit guarantee for SMEs, KOTEC for innovative technology firms and RCGF for micro enterprises. However, the basic assets of the three types of guarantee organizations are procured by contributions of the government, local governments and financial institutions. The contributions of the financial institutions are confirmative, due to set up legal rate, but the guarantee organizations' internal variables need to be utilized for calculation of government contributions. Especially, a careful attention should be paid to the movements of the number of bankrupt companies and unemployment rate using the guarantee balance and guarantee supply data as the external variables of the guarantee organizations. Based on such movements of the variables, the contributions of the government required for credit guarantee should be calculated in the procurement of basic asset [1].

The government needs to provide contributions continuously, and credit guarantee finances management is also required for SMEs' global competitiveness consolidation and growth potential expansion in the economic circumstances in which uncertainties always exist. If SMEs become sound as an economic growth engine, while the difficulties of SMEs' financial procurement are solved, total national wealth will become healthy naturally. The financial difficulties of SMEs and micro enterprises should be solved by actively utilizing the gearing ratio through more proactive and aggressive guarantee of guarantee organizations in addition to the financial policy direction for SMEs.

Hopefully, interdisciplinary studies are to be actively carried out so that the contributions of the government and financial institutions to credit guarantee organizations' basic assets can be enhanced. An in-depth study on the relation between the two variables, namely, basic asset and contributions is expected to be conducted, because the basic asset takes on a character of a reserve fund for subrogation of a financial institution, although this study did not identify. Lastly, a further study on the classification of basic asset into the contributions of the government, local governments and financial institutions, and the earned surplus of business performance is left as a task in the future [1].

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