UNIVERSITY OF MISKOLC

DOCTORAL SCHOOL OF ENTERPRISE THEORY AND PRACTICE
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DANG THAI BINH

THE IMPACT OF THE CREDIT GUARANTEE SYSTEM ON HUNGARIAN ECONOMY

Thesis Statements of Ph.D. Dissertation

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Contents

1. Introduction, rationale of the research

I began my Ph.D. studies as a full-time Ph.D student at Institute of World and Regional Economics, University of Miskolc from 2014. My research interest is in researching about credit guarantee for SMEs in Hungary and in the world, and its impact on the economy, SMEs and the banking system. Credit guarantee has an important role in the economy of each country. Itisapolicy instrumentto promoteSMEseasieraccess tocapital. Thereby helping SMEs development as well as promoting economic development. With passion in area of credit guarantee, the author focused on the impact of the credit guarantee system on Hungarian economy. With this research, the author would like to prove the positive impacts of the credit guarantee system on the Hungarian economy. Through this research, the author would like to contribute some solutions to improve the effectiveness of the credit guarantee system of Hungary.

The dissertation consists of three main chapters:

1. Overview about credit guarantee schemes in the world; what is the reason for the emergence of credit guarantee schemes which are found in the economic theories. Base on the liturature review, the author interprets the objectives of credit guarantee schemes, micro level and its role. At the same time, the author determined what kind of methods to evaluate the effects of the credit guarantee schemes which are used by the economist.

2. The impact of credit guarantee system on Hungarian economy, banking system and SMEs were determined. The author focused the impact of credit guarantee system in period from 2000-2013. In addition, the author built the process of the research and chosse appropriatemethods which will be use for the dissertation.

3. The author carried out an intensive evaluation of the effects of the credit guarantee system for the development of Hungarian economy and its role to deal with the financial crisis in 2008. Also, the author evaluated the effects of credit guarantee system on SMEs by increasing value added, labor, sales,

investment and reduce financial costs. Moreover, in this research the author pointed out credit guarantee system as an intermediary entity to help banks to unfreeze credit and share risk for banks in the lending process.

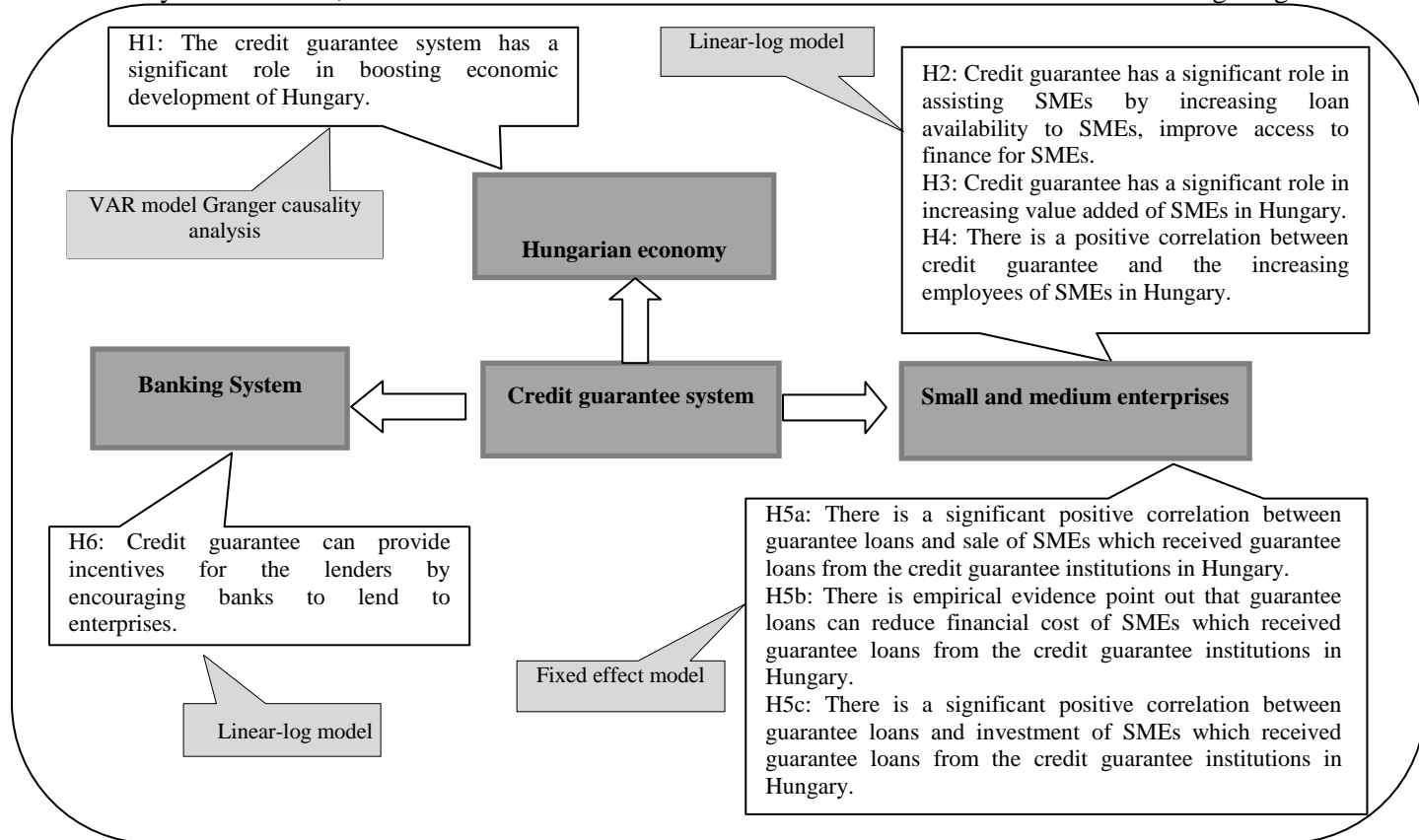## 2. Purpose and methodology of the research

The purpose of this study is to demonstrate the importance of the credit guarantee system for SMEs and the Hungarian economy as well as the banking system. This study focuses on assessing the impact of the credit guarantee system for the Hungarian economy in the following areas: economic development, credit operations, SMEs, labor, etc. The following questions arise:

1. What are those credit guarantee impacts on Hungarian economy?
2. What has changed in the economy from appearance of the credit guarantee system in Hungary?
3. How does the credit guarantee system affect the Hungarian economy?
4. How to assessing the impact of the credit guarantee system for the Hungarian economy?
5. Solutions to improve the performance of credit guarantee system and enhance its role for the Hungarian economy?

This study focuses on assessing the impacts of the credit guarantee system for the Hungarian economy. Based on the purpose and research questions, hypotheses are formulated at the beginning of the research and tested in the thesis. It is describedby the following figure 1.

Through Figure 1, I presented the hypotheses of my research as well as the methods that were applied to test the hypotheses. In addition, it is used to analyze the impact of the credit guarantee system on the Hungarian economy. From identifying hypotheses and methods as well as the content of the impact of the credit guarantee system on Hungarian economy, the author started to do deep and detailed research on methods. The data needed were collected and compliance with my thesis. Finally, I

made my calculations, and I drafted the thesis statements as shown in the following Figure 2.

H1: The credit guarantee system has a significant role in boosting economic development of Hungary.

VAR model Granger causality analysis

Linear-log model

H2: Credit guarantee has a significant role in assisting SMEs by increasing loan availability to SMEs, improve access to finance for SMEs.
H3: Credit guarantee has a significant role in increasing value added of SMEs in Hungary.
H4: There is a positive correlation between credit guarantee and the increasing employees of SMEs in Hungary.

Hungarian economy

Banking System

Credit guarantee system

Small and medium enterprises

H6: Credit guarantee can provide incentives for the lenders by encouraging banks to lend to enterprises.

Linear-log model

Fixed effect model

H5a: There is a significant positive correlation between guarantee loans and sale of SMEs which received guarantee loans from the credit guarantee institutions in Hungary.
H5b: There is empirical evidence point out that guarantee loans can reduce financial cost of SMEs which received guarantee loans from the credit guarantee institutions in Hungary.
H5c: There is a significant positive correlation between guarantee loans and investment of SMEs which received guarantee loans from the credit guarantee institutions in Hungary.

Figure 1: Structure of the study with hypotheses and methods of analysis
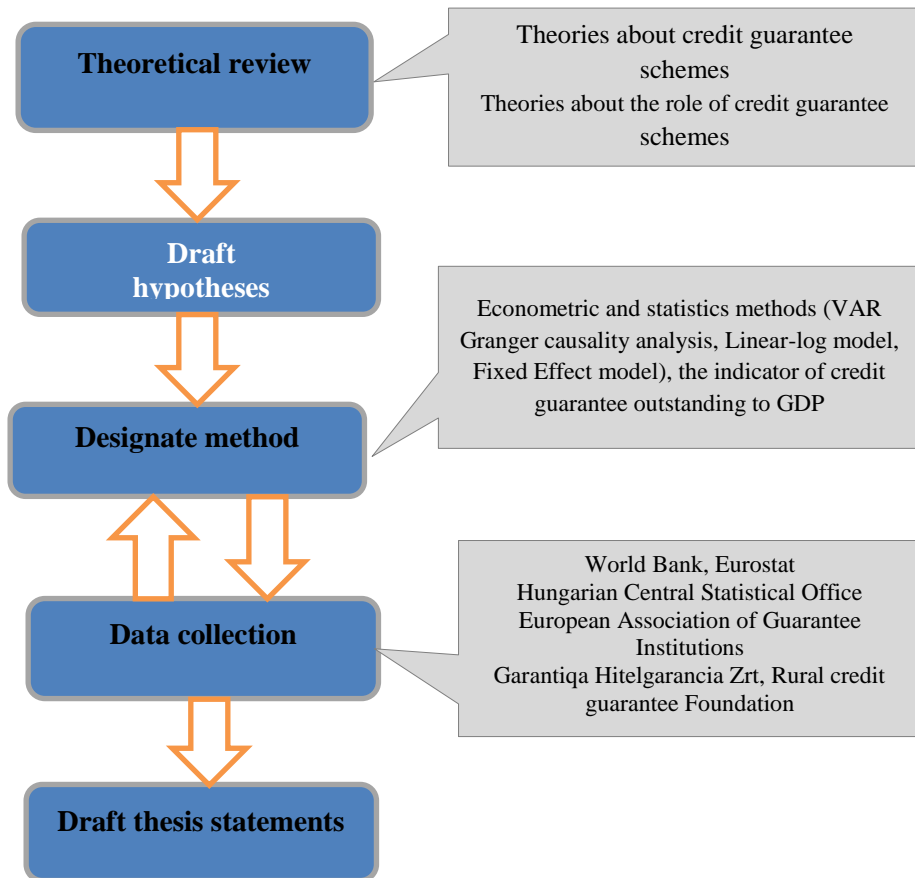
Source: Own editing

Figure 2: Progress of the research

The main aim of this research is to analyze the impact of the credit guarantee system on Hungarian economy from 2000 to 2013. In my

research, I used mainly database from the World Bank, Eurostat, Hungarian Central Statistical Office, European Association of Guarantee Institutions, Garantiqa Hitelgarancia Zrt, Rural Credit Guarantee Foundation, etc. In my dissertation, I examined the following hypotheses:

Hypothesis 1: There is empirical evidence that the operation of the credit guarantee system has an important role in Hungary's GDP growth. When credit guarantee system supports SMEs easier to access bank financing mean it helps SMEs survive and development. Through it, credit guarantee system promotes the development of Hungarian economy; in particular, it is an important tool to deal with the financial crisis in 2008 and help economic recovery of Hungary.

Hypothesis 2: For SMEs, in particular, SMEs have difficulty accessing bank financing due to insufficient conditions about collateral, creditworthiness, etc.; credit guarantee is useful tools to help SMEs overcome that obstacles. By providing credit guarantees, the credit guarantee institutions increase to access bank financing for SMEs and reduce their credit constraint.

Hypothesis 3: Credit guarantee is regarded as a policy tool of the government to help SMEs overcome obstacles in accessing finance. By helping SMEs easily access finance, the credit guarantee institutions promote the development of SMEs.

Hypothesis 4: Through guarantee activities, the credit guarantee institutions support SMEs to survive and develop. When SMEs exist and develop, they will attract and create more jobs, reduce unemployment. At the same time, it helps to increase the proportion of employees of SMEs in the total labor force of Hungary.

Hypothesis 5: When SMEs receive loan guarantees from the credit guarantee institutions, it will make changing in their status and performances. Meaning that guarantee loans with favourable conditions can promote SMEs increasing sales, increase their R&D and investment and hence productivity growth, reduce financial cost.

H5a, There is a significant positive correlation between guarantee loans and sales of SMEs which received guarantee loans from the credit guarantee institutions in Hungary

H5b, There is empirical evidence point out that guarantee loans can reduce financial cost of SMEs which received guarantee loans from the credit guarantee institutions in Hungary.

H5c, There is a strong positive correlation between guarantee loans and investment of SMEs which received guarantee loans from the credit guarantee institutions in Hungary

Hypothesis 6: SMEs as customers have large numbers but many risks in the lending activities for banks. Therefore, between SMEs and banks have a gap in the provision of credit. By providing guarantee loans, credit guarantee institutions have an important role in unfreezing of credit from banks to SMEs, reducing the gap between banks and SMEs in credit activities. Since then credit guarantee reduces risk for bank, transfer risk to the credit guarantee institutions, reduce costs related to collateral assets, etc.

3. Result of Empirical Tests

To assess the impact of the credit guarantee system on Hungarian economy, SMEs, banks, the author used econometric techniques. At the same time, the author used financial data concerning a sample of SME, the macro data related to GDP, value added of SMEs, employee of SMEs, total employees, and the data related to guarantee value of credit guarantee institutions of Hungary, etc. My aim is to find econometric evidence about positive effect of the credit guarantee system on economic additionality and financial additionality for Hungarian economy, SMEs and banks.

In this research, the author used main econometric test methods will ensure better evaluation, and its results are strong evidence, meaningful. To test the hypotheses in the thesis, the author used many different methods in quantitative analysis such as VAR Granger Causality model, Fixed effect model, Linear-log model, etc. Base on hypotheses, type of variables, the purpose of testing, type of data, etc the author will select appropriate methodology for testing. Thesehypotheses were testedwith0, 05level of significance and were done by EVIEW. All hypotheses are tested and evaluated specific results, which are presented following:

H1:The credit guarantee system has a significant role in boost economic development of Hungary

First, To determine if the credit guarantee system has a significant role in boost economic development of Hungary, the author used VAR Granger Causality model to test hypothesis 1. This is the type of model, which indicates causes and results. By this method, the author examined whether guaranteed loans isthe causeof GDP.

Causality test				
Granger causality	**Lags**	**Guaranteed loans ---> GDP**	**GDP ---> Guaranteed loans**	**Test**
Guaranteed loans ---> GDP	2	2950342 (0,0000)*	2245038 (0,0000)*	VAR model

Comment: by VAR models I present the F-tests of zero restrictions, in parentheses the p-value; * 5% significance level; GDP: gross domestic product at current prices.

Source: Own edition and calculations (EVIEW).

Table 1:Test H1 by using VAR Granger Causality model

The result shows that the value of Chi square statistic is 29.50342, and its corresponding P value is 0.0000 < 0.05. Since the P value is less than 0.05, we can conclude that guaranteed loans cause GDP. Therefore, we

accept hypothesis HA: The credit guarantee system has a significant role in boosting economic development of Hungary.

Besides, in order to determine whether the credit guarantee system has a significant role in boost economic development of Hungary, a Linear-Log model was applied using EVIEW.

Linear-Log model	
	The credit guarantee system has a significant role in boost economic development of Hungary
R-squared	0.450063
Coefficient	1348733
Prob (F-statistic)	0.0000

Source: Own edition and calculations (EVIEW)

Table 2: Test H1 by using Linear-Log model

From the table above we can observe that R-squared is 0.450063, and its corresponding P value is $0.0000 < 0.05$. Based onthe regression functionobtained, we can conclude that hypothesis HA is appropriateandacceptable.

In addition, according to European Association of Guarantee Institutions (AECM) the importance of a credit guarantee institution in the economy can be measured by the ratio of outstanding guarantees to GDP. If this ratio is greater than 1%, that means the credit guarantees system has an important role in the development of the economy.

	2007	2008	2009	2010	2011	2012
Hungary	1.49%	1.50%	1.87%	1.64%	1.37%	1.46%
Average of ACEM	0.62%	0.62%	0.78%	0.67%	0.58%	0.56%

Source: http://www.aecm.eu, http://ec.europa.eu/eurostat and own elaboration

Table 3: Outstanding guarantees to GDP of credit guarantee system of Hungary in the period 2007 -2012 (%)

Looking at Table3, it shows the ratio of Hungary increased steadily from 2007 to 2012 and in particular, this ratio increased during the financial crisis from 2008 to 2010. It expresses the guarantee system of Hungary plays major role in helping to stabilize the economy during the financial crisis. To explain the position of the credit guarantee system in the Hungarian economy, we can compare the ratio of credit guarantee system of Hungary with other countries in the European region. This ratio of Hungary is very high when comparison with other countries in the region and ranks only second behind Italy.

Moreover, based on the research by Tamási and Vilagi (2011) showed that if 1 percent decreasing in credit supply will reduce Hungary's 0.2 percent of GDP. Thus, in the absence of the presence of credit guarantee system would reduce the GDP of Hungary as follows:

Year	Potential GDP decrease in the lack of credit guarantee system (%)	Potential GDP decrease (Billion HUF)
2000	0.65	8,703
2001	0.77	11,893
2002	0.92	15,964
2003	0.84	16,063
2004	1.19	25,021
2005	0.76	17,099
2006	0.83	20,139
2007	0.97	24,852

2008	1.09	29,381
2009	1.32	34,699
2010	1.16	31,327
2011	0.89	24,937
2012	0.87	24,989
2013	1.01	30,469
Total	**13.29**	**315,538**

Source: Own calculation base on data from Garantiqa and Rural Credit Guarantee Foundation, https://www.ksh.hu

Table 4: The impact of credit guarantee system on the budget of Hungary

The above results indicates that Hungary's GDP from 2000-2013 can decrease 13.29% and its corresponding reduction 315.538 billion HUF. There are also many other researches indicated a positive impact of credit guarantes for the economy (World Bank, 2012). According research by Crowling (2010), indicated that credit guarantee reduced credit rationing. Riding et al (2001) when studied the credit system of Canada found that 75% of enterprises would not have received loans. A research by Schmidt et al (2010), indicated that without guaranteed loans will decrease 0.1% GDP of Germany. So, we can confirm that credit guarantee has significant role and is useful financial tool to promote growth and economic development.

H2:Credit guarantee has a significant role in assisting SMEs by increasing loan availability, improve access to finance for SMEs

In order to determine whether credit guarantee has a significant role in assisting SMEs by increasing loan availability, improve access to finance for SMEs, a Linear-Log model. First, the author selected the following function to test the hypothesis:

12

LSME = C(1) + C(2)*Log (GRT)

(LSME: loan availability to SMEs by banks; GRT: guaranteed loans by credit guarantee system)

The data was analyzed with Eview software and the following regression function was obtained:

LSME = -9419.620+ 2228.756*Log (GRT)

Linear-Log model	
R-squared	Credit guarantee has a significant in assisting SMEs by increasing loan availability to SMEs, improve access to finance for SMEs 0.771945
Coefficient	2228.756
Prob (F-statistic)	0.000035

Source: Own edition and calculations (EVIEW)

Table 5: Test H2 by using Linear-Log model

From the table above we can observe that R-squared is 0.771945, and its corresponding P value is 0.000035 < 0.05.Based onthe regression functionobtained, we can conclude that hypothesis HA is appropriateandacceptable: Credit guarantee has a significant role in assisting SMEs by increasing loan availability, improve access to finance for SMEs.

H3:Credit guarantee has a significant role in increasing value added of SMEs in Hungary

In order to determine whether credit guarantee has a significant role increasing value added of SMEs in Hungary, a Linear-Log model was applied using EVIEW.

First, the author selected the following function to test the hypothesis:

$$VDS = C(1) + C(2)*Log(GRT)$$

(VDS: value added of SMEs in Hungary; GRT: guaranteed loans by credit guarantee system)

The data was analyzed with Eview software and the following regression function was obtained:

$$VDS = -10013.48 + 2875.790 * Log(GRT)$$

Linear-Log model	
	Credit guarantee has significant in increasing value added of SMEs in Hungary
R-squared	0.804381
Coefficient	2875.790
Prob (F-statistic)	0.000014

Source: Own edition and calculations (EVIEW)

Table 6: Test hypothesis H3 by using Linear-Log model

From the table above we can observe that R-squared is 0.804381, and its corresponding P value is $0.000014 < 0.05$. Based onthe regression functionobtained, we can conclude that hypothesis HA is appropriateandacceptable: Credit guarantee has a significant role in increasing value added of SMEs in Hungary.

Moreover, the fact that, during the period from 2000-2013 Valued added created by SMEs tend to be growing, it represents growth and development of SMEs in Hungary. At the same time, it also represents the Hungarian government's policies to focus more resources to support for SMEs and through this also represents credit guarantee system is effective in supporting SMEs create more value added and developing. It proves the credit guarantee system is an important policy tool of the state in promoting SMEs and the Hungarian economy.
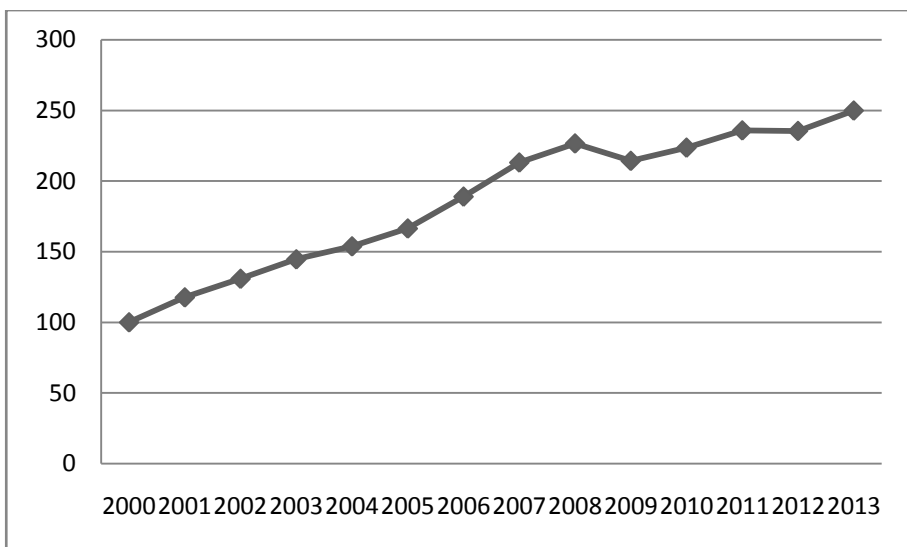
Figure 3: Value added created by SMEs of Hungary (2000=100%)

H4: There is a positive correlation between credit guarantee and the increasing employees of SMEs in Hungary.

In order to determine whether credit guarantee has made increasing employees of SMEs in Hungary, a Linear-Log model was applied using EVIEW.

First, the author selected the following function to test the hypothesis:

$$ESMTT = C(1) + C(2)*Log\ (GRLE)$$

(ESMTT: Employee of SMEs/Total employees; GRLE: guaranteed loans by credit guarantee system/ Total loans to SMEs by banks).

Linear-Log model		
	There is a positive correlation between credit guarantee and the increasing employees of SMEs in Hungary	
R-squared		0.385291
Coefficient		0.037838
Prob (F-statistic)		0.0236

Source: Own edition and calculations (EVIEW)

Table 7: Test hypothesis H4 by using Linear-Log model

From the table above we can observe that R-squared is 0.385291, and its corresponding P value is $0.0236 < 0.05$. Based onthe regression functionobtained, we can conclude that hypothesis HA is appropriateandacceptable: There is a positive correlation between credit guarantee and the increasing employees of SMEs in Hungary.

H5a:There is a significant positive correlation between guarantee loans and sales of SMEs, which received guarantee loans from the credit guarantee institutions in Hungary.

In order to determine whether there is a strong positive correlation between guarantee loans and sales of SMEs, which received guarantee loans from the credit guarantee institutions in Hungary, a Fixed effect model was applied using EVIEW.

First, the type of data which was used by the author to test hypothesis 5a is panel data because the data was collected from 50 companies during the three years from 2012 to 2014. Therefore, the author needs to check the Hausman ratio to choose which model (Fixed effect model or Random effect model) will be used.

Hausman Test	
Chi-Sq. Statistic	22.560417
Chi-Sq. d.f.	1
Prob.	0.0000

Source: Own edition and calculations (EVIEW)

Table 8: Hausman test for hypothesis H5a

From the table above, we can observe that the Hausman ratio is $0.0000 < 0.05$, therefore Fixed effect model was selected to test hypothesis H5a

Fixed effect model	
R-squared	There is a significant positive correlation between guarantee loans and sales of SMEs, which received guarantee loans from the credit guarantee institutions in Hungary
	0.996506
Coefficient	-0.007716
Prob(F-statistic)	0.0002

Source: Own edition and calculations (EVIEW)

Table 9: Test hypothesis H5a by using Fixed effect model

From the table above we can observe that R-squared is 0.996506, and its corresponding P value is $0.0002 < 0.05$. Due to P value less than 5%, we reject hypothesis Ho and accept hypothesis HA: There is a significant positive correlation between guarantee loans and sales of SMEs, which received guarantee loans from the credit guarantee institutions in Hungary.

H5b:There is empirical evidence point out that guarantee loans can reduce financial cost of SMEs, which received guarantee loans from the credit guarantee institutions in Hungary.

In order to determine whether there is empirical evidence point out that guarantee loans can reduce financial cost of SMEs, which received guarantee loans from the credit guarantee institutions in Hungary, a Fixed effect model was applied using EVIEW.

First, the author determines the type of data, which used to test hypothesis 5a is kind of panel data because the data was collected from 50 companies during the three years from 2012 to 2014. Therefore, the author should check Hausman ratio to choose which model (Fixed effect model or Random effect model) will be used.

Hausman Test	
Chi-Sq. Statistic	8.182772
Chi-Sq. d.f.	1
Prob.	0.0042

Source: Own edition and calculations (EVIEW)

Table 10: Hausman test for hypothesis H5b

From the table above we can observe that the Hausman ratio is 0.0042 < 0.05, therefore Fixed effect model was selected to test hypothesis H5b
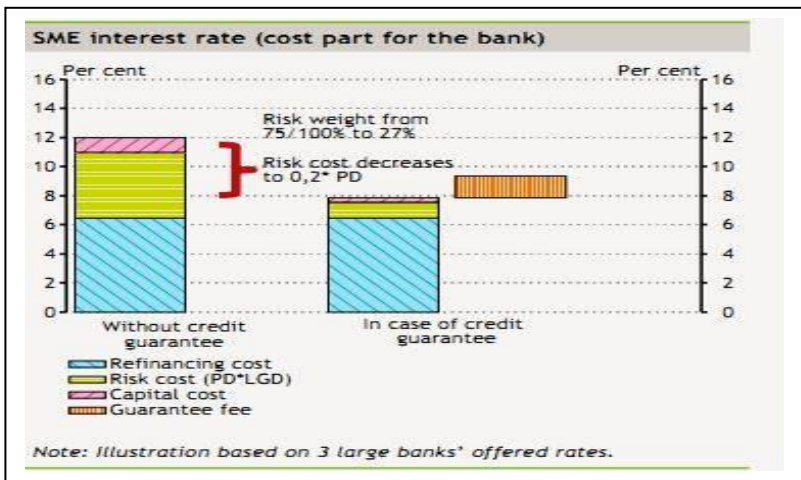
Fixed effect model	
R-squared	There is empirical evidence point out that guarantee loans can reduce financial cost of SMEs, which received guarantee loans from the credit guarantee institutions in Hungary 0.926926
Coefficient	0.000693
Prob (F-statistic)	0.000000

Source: Own edition and calculations (EVIEW)

Table 11: Test hypothesis H5b by using Fixed effect model

From the table above we can observe that R-squared is 0.926926, and its corresponding p value is $0.000000 < 0.05$. Due to P value less than 5%, we reject hypothesis Ho and accept hypothesis HA: There is empirical evidence point out that guarantee loans can reduce financial cost of SMEs, which received guarantee loans from the credit guarantee institutions in Hungary.

In addition, according to the Financial Stability Report on (2012) of Magyar Nemzeti Bank, pointed out the role of credit guarantees for lending operations. This research concerned the loss given default and the offered interest rate condition of 3 large banks of Hungary. The results of this study indicated that: *"if companies' total loan demand was satisfied even without a credit guarantee, a credit guarantee could still have a positive impact: namely, bank's credit supply would increase as result of cost reduction achieved, but for another clientele"*. This proves that the credit guarantee has role in reducing interest rate as well as reducing financing cost of SMEs which received guarantee loans from credit guarantee institutions.

SME interest rate (cost part for the bank)

Per cent — Per cent

Risk weight from 75/100% to 27%

Risk cost decreases to 0,2* PD

Without credit guarantee — In case of credit guarantee

Refinancing cost
Risk cost (PD*LGD)
Capital cost
Guarantee fee

Note: Illustration based on 3 large banks' offered rates.

Source: Magyar Nemzeti Bank (2012)

Figure 4: The role of credit guarantee in reducing the interest rates of SMEs

H5c:There is a strong positive correlation between guarantee loans and investment of SMEs, which received guarantee loans from the credit guarantee institutions in Hungary.

In order to determine whether there is a strong positive correlation between guarantee loans and investment of SMEs, which received guarantee loans from the credit guarantee institutions in Hungary, a Fixed effect model was applied using EVIEW.

First, the author determines the type of data which used to test hypothesis 5a is kind of panel data because the data was collected from 50 companies during the three years from 2012 to 2014. Therefore, the author should check Hausman ratio to choose which model (Fixed effect model or Random effect model) will be used.

Hausman Test	
Chi-Sq. Statistic	4.567985
Chi-Sq. d.f.	1
Prob.	0.0326

Source: Own edition and calculations (EVIEW)

Table 12: Hausman test for hypothesis H5c

From the table above we can observe that the Hausman ratio is $0.0326 < 0.05$, therefore Fixed effect model was selected to test hypothesis H5c

Fixed effect model	
	There is a strong positive correlation between guarantee loans and investment of SMEs, which received guarantee loans from the credit guarantee institutions in Hungary
R-squared	0.940442
Coefficient	-2.49E-07
Prob(F-statistic)	0.0062

Source: Own edition and calculations (EVIEW)

Table 13: Test hypothesis H5c by using Fixed effect model

From the table above we can observe that R-squared is 0.940442, and its corresponding p value is 0.0062 < 0.05. Due to P value less than 5%, we reject hypothesis Ho and accept hypothesis HA: There is a strong positive correlation between guarantee loans and investment of SMEs, which received guarantee loans from the credit guarantee institutions in Hungary.

H6:**Credit guarantee can provide incentives for lender by encouraging banks to lend to enterprises.**

In order to determine whether credit guarantee can provide incentives for lender by encouraging banks to lend to enterprises, a Linear-Log model was applied using EVIEW.

First, the author selects form of the function to estimate is:

TL = C(1) + C(2)*Log (GRT)

(TL: total loans by banks in Hungary; GRT: guaranteed loans by credit guarantee system)

Then the author estimated by Eview software and obtained the regression function:

TL = -13810.44+ 3542.719*Log (GRT)

Linear-Log model	
	Credit guarantee can provide incentives for lender by encouraging banks to lend to enterprises.
R-squared	0.886449
Coefficient	3542.719
Prob (F-statistic)	0.000001

Source: Own edition and calculations (EVIEW)

Table 14: Test hypothesis H6 by using Linear-Log model

From the table above we can observe that R-squared is 0.886449, and its corresponding P value is 0.000001< 0.05. Therefore,we canconclude thatthe regression functionobtainedisappropriateandacceptablehypothesis HA: Credit guarantee can provide incentives for lender by encouraging banks to lend to enterprises.

In fact, the significance of the credit guarantee system has been shown to help ensuring that the stability of financial markets. For banks and financial institutions when loan that has the guarantee of a credit guarantee institution means that the risk of such loans will be reduced. And for banks and financial institutions when loan that the credit guarantee, under Basel II, it will reduce the burden on capital requirements of financial institutions. It means that banks and credit institutions can expand the scope of loan to SMEs. It means that the credit guarantee system contributes to the expansion of lending by banks and financial institutions to SMEs in Hungary.

4. Conclusions and recommendations
Conclusions

The main contribution of this paper is to evaluating the impact of the credit guarantee system to SMEs, the economy and the banking sector. Through the above analysis, this paper shows that credit guarantee system in Hungary has significant impact in bringing many benefits to SMEs such as help SMEs to get easier access to capital and low interest rates, reduction in finance cost, increase the volume and the time of the loans and innovation. In this study also indicated that at the macro level, the system has an important role in promoting the development of SMEs and also there are many programs for support to SMEs especially in financial crisis.

For the economy, a significant effect is to stabilize the economy. Especially in this study the author demonstrated that the credit guarantee system has an important role and is a factor that contributes to GDP

growth. Besides, credit guarantee system was considered to be an effective policy instrument to help the government to deal with and overcome financial crisis. Furthermore, through promoting and supporting SMEs development, it will lead to growth and development of the economy. Also, this study pointed out the impact of the credit guarantee system to financial institutions. Credit guarantee system shares the risk with the banks through credit guarantees, and helps the banks to expand lending, reduce costs in the lending process and reduce capital requirements of banks. In addition, this study also indicated that the credit guarantee system has an important role in creating jobs.

To achieve the objectives of this research, a quantitative research method was applied. By using quantitative research methods combined with the actual evidence, it will ensure that the result of this research is credible and valuable for utilization.

Based on the literature review, data analysis and hypotheses testing, the following are the results of the findings and research:

No.	Thesis statement
Thesis 1	The credit guarantee system has a significant role in boosting economic development of Hungary
Thesis 2	Credit guarantee has a significant in assisting SMEs by increasing loan availability to SMEs, improve access to finance for SMEs
Thesis 3	Credit guarantee has a significant in increasing value added of SMEs in Hungary.
Thesis 4	There is a positive correlation between credit guarantee and the increasing employees of SMEs in Hungary.
Thesis 5a	There is a strong positive correlation between guarantee loans and sales of SMEs, which received guarantee loans from the credit guarantee institutions in Hungary.
Thesis 5b	There is empirical evidence point out that guarantee loans can reduce financial cost of SMEs, which received guarantee loans from the credit guarantee institutions in Hungary.

Thesis 5c	There is a strong positive correlation between guarantee loans and investment of SMEs, which received guarantee loans from the credit guarantee institutions in Hungary
Thesis 6	Credit guarantee can provide incentives for lender by encouraging banks to lend to enterprises.

Source: own editing

Table 15: Theses statements

Through the implementation of this study as well as during my research on the credit guarantee system of Hungary and around the world, the author offers some solutions to improve the system of credit guarantees of Hungary, which are as follows:

• The credit guarantee institutions of Hungary as well as credit guarantee institutions around the world is considered as financial intermediaries; therefore, it needs to strictly adhere to the rules and regulations.

• However, the credit guarantee institutions characterized in encouragement, support borrowers and lenders and influenced by moral hazard in the financial relationships in the process of implementation of guarantee activities. Thus, to ensure the development and sustainability of credit guarantee institutions, it is necessary to closely monitor credit guarantee institutions; they should be transparent in their operations and compliance with rules and regulation.

• The credit guarantee institution is generally considered as a tool to support SMEs so that each organization should set objectives and specific target subjects, the program guarantees required special programs and avoid to overlap in order not to waste financial resources.

• The credit guarantee institutions should be designed and organized activities to help troubled firms in accessing finance due to insufficient collateral, lack of credit history, etc. Credit guarantee organization with appropriate design will ensure the provision of financial and economic

additionality to the economy, SMEs, banks as well as assure financial sustainability of itself.

- Credit guarantee institutions and the banks should coordinate their activities to reduce the problem of asymmetric information between borrowers and lenders, especially SMEs. At the same time, building a credit information system to collect information about SMEs which help any lender or credit guarantee organization to easily obtain information on SMEs to assess SMEs.

- Credit Guarantee Institutions need to get support from the government, including the guarantee of private organizations to ensure survival and sustainable development. Nevertheless, credit guarantee institutions should implement effectively the objectives of the government. In addition, credit guarantee institutions also need the cooperation and support from the banks in guarantee activities. It will create a mechanism to share the risks and responsibilities associated with relative entities (banks, credit guarantee institutions, SMEs), and avoids moral hazard.

- To operate efficiently, credit guarantee institution should pay special attention to structural cost, financial management, credit quality, etc. It will help the credit guarantee institutions to earn the benefit from guarantee activities, more independence and reduce reliance or government intervention.

Further recommendation

Credit guarantee system has an important role to SMEs, the economy and the financial institutions. Therefore, assessing the impact of the credit guarantee for the above objects is a critical research content. In the future, the scholars can research and assess the impact of the credit guarantee system for each industry, specific sectors (agriculture, industry, services, etc) or the region of Hungary. Another research approach that the scholars can focus on is the impact of credit guarantees on banks' bad debts.

In addition, further research should be conducted to study the credit guarantee demand for SMEs and what factors affecting the credit guarantee demand for SMEs. It would be very useful for credit guarantee institutions, policy makers, banks and the government.

References:
[1] AECM. (2010). Guarantees and the recovery: The impact of anti-crisis guarantee measures. European Association of Mutual Guarantee Societies.
[2] AECM. (2012). AECM: Pricing survey: How AECM members price their Guarantees?, August 2012, available at www.aecm.be/fr/pricing-survey-september-2012.html?IDC=31&IDD=1605.
[3] Apatini, K. (1999). Kis- és középvállalkozások finanszírozása. Budapest: Közgazdasági és Jogi Könyvkiadó.
[4] Aunuchitworawong et al. (2006). The Economic Impact of Small Business Credit Guarantee. TDRI Quaterly Review, June: 17-21.
[5] Bálint Tamási and Balázs Vilagi. (2011). Identification of credit supply shocks in a Bayesian SVAR. Model of the Hungarian Economy. Magyar Nemzeti Bank Papers 7, 2011.
[6] Bateman, M., & Chang, H. (2009). The microfinance illusion. University of Cambridge
[7] Beck et al. (2005). Financial and Legal Constraints to Growth: Does Firm Size Matter? The Journal of Finance, LX (1), February
[8] Beck et al. (2008). Typology of Partial Credit Guarantee Funds around the World. Policy Research Working Paper 4771, World Bank.
[9] Beck, T and de la Torre, A. (2007). The Basic Analytics of Access to Financial Services. Financial Markets, Institutions and Instruments, 16(2): 79, 117

[10] Beck, T., Klapper, L.F., & Mendoza, J.C. (2010). The typology of partial credit guarantee funds around the word. Journal of Financial Stability, 6(1), 10-25.

[11] Berger, A. N and Udell, G. F. (2006). A More Complete Conceptual Framework for SME Finance. Journal of Banking and Finance, 30:2945-66.

[12] Boocok, G., & Shariff, M.N.M. (2005). Measuring the effectiveness of the credit guarantee schemes. International Small Business Journal, 23(4), 427-454.

[13] Busetta, G and Presbiterio, A. (2008). Confidi, piccole imprese e banche: un'analisi empirica. I vincoli finanziari alle crescita delle imprese, Rome: Carocci.

[14] Cécile et al. (2012). Assessing Credit Guarantee Schemes for SME Finance in Africa Evidence from Ghana, Kenya, South Africa and Tanzania. AFD Working Paper 123, April 2012.

[15] Central Statistical Office of Hungary: http: //www.ksh.hu

[16] Colomba et al. (2009). The Effects of Mutual Guarantee Consortia on the Quality of Banking Lending. Revue Bancaire et Financiere, 4.

[17] Colomba et al. (2010). Mutual guarantee institutions and small business finance. Journal of Financial Stability, Vl. 6(1), pp. 45-54.

[18] Cowling, M. (2010). The Role of Loan Guarantee Schemes In Alleviating Credit Rationing In UK. Journal of Financial Stability Partial Credit Guarantees: Experiences & Lesson, special issue: 36-44

[19] Cowling, M. and Mitchell, P. (2003). Is the Small Firms Loan Guarantee Scheme Hazardous for Banks or Helpful to Small Business? Small Business Economics, 21(1):63-71.

[20] Craig et al. (2008). Credit Market Failure Intervention: Do Government Sponsored Small Business Credit Programs Enrich Poorer Areas? Small Business Economy, 30:345-60.

[21] Craig et al. (2010). The Important of Financial Market Development on the Relationship between Loan Guarantees for SMEs and Local

Market Employment Rates. Federal Reserse Bank of Cleveland Working Paper, November.

[22] D'Ignazio and Menon C. (2012). Evaluating credit guarantees for SMEs: evidence from Italy. Bank of Italy Working Paper.

[23] Dang Thai Binh. (2015). Economic Impact of Credit Guarantee System-Hungarian case study. Theory, Methodology, Practice Journal, Volume 11: 2015, Pages 25-35

[24] Dang Thai Binh. (2015). Study on the credit guarantee system: The case of the V4 countries. Challenges in Economic and Technological Development Conference, October 2015, ISBN 978-963-358-100-1

[25]Database of the European Union: http: //epp.eurostat.ec.europa.eu/portal/page/portal/statistics

[27] Davies, I. (2007). People's Republic of China: Development of Small and Medium-Sized Enterprises Credit Guarantee Companies. Asian Development Bank.

[28] De Gobbi, M.G. (2003), Mutual Guarantee Associations for Small and Micro Entrepreneurs: Lessons Learned from Europe and Africa African Development Review vol. 15(1), pp. 23-34, June 2003.

[29] De la Torre et al., (2010). Bank involvement with SMEs: beyond relationship lending. Journal of Banking and Finance, 34 (9), 2280-2293.

[30] Deelen L. and Molenaar K. (2004), Guarantee Funds for Small Enterprises. A manual for guarantee fund managers, International Labour Organisation.

[31]DFID (2005), Do Credit Guarantees Lead to Improved Access to Financial Services? Recent evidence from Chile, Egypt, India and Poland, Policy Division Working Paper, UK Department for International Development. Freedman, 2004

[32] European Association of Guarantee Institutions (AECM): http://www.aecm.eu,

[33] European Commission. (2014). Retrieved from : http://ec.europa.eu/DocsRoom/documents/5625/attachments/15/translatio ns/en/renditions/native

[34] European Commission. (2006). Guarantees and Mutual Guarantees. No. 3 Best Report.

[35] European Commission. (2013). Report on the Access to Finance of Small and Medium-sized Enterprises (SAFE) in 2013.

[36] European Investment Bank. (2014). Credit Guarantee Schemes for SME lending in Central, Eastern and South-Eastern Europe. A report by the Vienna Initiative Working Group on Credit Guarantee Schemes, November 2014

[37] Freedman, P. L. (2004). Designing loan guarantees to spur growth in developing countries. Washington: US Agency for International Development.

[38] Fülöp, G. (2004). Kisvállalati gazdálkodás. Budapesti Közgazdaságtudományi és Államigazgatási Egyetem: Aula Kiadó.

[39] Gale W. (1991). Economic Effects of Federal Credit Programs. American Economic Review, 81:1, 133-52, March 1991.

[40] Garantiqa Creditguarantee Co. Ltd: http://www.hitelgarancia.hu/ Garantiqa Creditguarantee Co.Ltd. (2012). Announcement. (http://www.hitelgarancia.hu/en/download)

[41] Garantiqa Creditguarantee Co.Ltd. Annual Report 2001 -2013. (http://www.hitelgarancia.hu/en/introduction/annual-reports)

[42] Garantiqa Creditguaranteee Co.Ltd. (2010). Business regulations. (http://www.hitelgarancia.hu/en/download)

[43] Gittell, R and Kaen, F. R. (2003). A Framework for Evaluating State-assited Financing Programe (1). Public Finance and Management, 3(3): 296-331.

[44] Graham, T. (2004). Graham Review of the Small Firms Loan Guarantee Recommendations. London: HM Treasury

[45] Green, A. (2003). Credit Guarantee Schemes for Small Enterprises: An effective Instrument to Promote Private Sector-led Growth? United Nations Development Organisation, Working Paper No.10, August 2003.

[46] Hancock et al. (2007). The Repercussions on Small Banks and Small Businesses of Procylical Bank Capital and Countercylical Loan Guarantees. AFA 2008 New Orleans Meeting Paper, SSRN (Social Science Research Network)

[47] Honohan, P. (2008). Partial Credit Guarantees: Principles and Practice. Conference on Partial Credit Guarantees Washington, DC, Trinity College Dublin, 13-14 March.

[48] Honohan, P. (2010). Partial Credit Guarantees: principles and practice. Journal of Financial Stability, (6), 1-9, p.3

[49] Iihyock Shim. (2006). Corporate credit guarantees in Asia. BIS Quaterly Review.

[50] Jonsson, M. (2009). Performance of Credit Guarantee Schemes (CGS)'. Secretaria General Iberoamecicana, Madrid, Spain.

[51] Julien Lifilleur. (2009). Financing SMEs in a context of strong information asymetry. Issue 1 May 2009, Proparco's magezin.

[52] Kang, J., & Heshmati, A. (2008). Effect of credit guarantee policy on survival and performance of SMEs in Republic of Korea. Small Business Economics, 31(4), 445-462.

[53] Korea Credit Guarantee Fund. (2012). Credit guarantee and credit evaluation system for SME development in Kazakhstan. Knowledge sharing program.

[54] Kovács Levente. (2012). The Hungarian Banking Sector and its Challenges. Hungarian Financial Almanac 2012-2013, ISSN 2063-188X, pp. 84-89.

[55] KPMF. (1999). An Evaluation of The Small Firms Loan Guarantee Scheme. London: DTI.

[56] KPMG. (2012). Credit access guarantees: a public asset between the State and the Market. International survey on guarantee market player, KPMG Advisory.

[57] Krisztián, T. C and József, F. (2014). Bank financing of Hungarian SMEs: Getting over to credit crisis by state interventions. Research Journal of Finance and Accounting, ISSN 2222-1697 (Paper), Vol.5, No.5, 2014, pp. 1-15

[58] László Demeter. (2010). The Role of Subventioned Micro Credit in Financing Small and Medium-sized Enterprise in Hungary. Periodica Oeconomica, October 2010, pp. 130-139.

[59] Leistner, M. (1999). The growth and environment scheme. Greener Management International, 1(27), 79

[60] Lelarge et al. (2008). Entrepreneurship and Credit Constraints, Evidence from a French Loan Guarantee Program. National Bureau of Economic Research.

[61] Levitsky, J. (1997a). Credit guarantee schemes for SMEs–an international review. Small Enterprise development, 8(2), 4-17.

[62] Levitsky, J. (1997b). SME guarantee schemes: a summary. The financier, 4(1/2), 5-11.

[63] Levitsky, J., Ranga, N. P. (1989). Credit Guarantee Schemes for Small and Medium Enterprises. World Bank technical paper number 58.

[64] Linda Deelen & Klass Molenaar. (2004). Guarantee Funds for Small Enterprises A manual for guarantee fund managers. ISBN 92-2-116033-5

[65] Magyar Nemzeti Bank. (2012). Report on financial stability. Magyar Nemzeti Bank, November 2012.

[66] Magyar Nemzeti Bank: http://felugyelet.mnb.hu

[67] Makhool et al. (2005). Financing Palestinian SME's. Palestinian Economic Research Institute (MAS), 6 September.

[68] Mankiw et al. (1986). The Allocation of Credit and Financial Collapse. The Quaterly Journal of Economics, August: 455-70.

[69] María del Carmen et al. (2004). Export Credit Guarantees, Moral Hazard and Exports Quality. Bulletin of Economic Research 56:4, 2004, 0307–3378.

[70] Mendizabal et al. (2014). Degree of Guarantee Rationing and Banking Relationship of Spanish SME. Procedia - Social and Behavioral Sciences, Volume 109, 8 January 2014, Pages 753–757

[71] National Economic Research Associates (Nera). (1990). An Evaluation of The Loan Guarantee Scheme. Research Paper, No.74. London: Department of Employment.

[72] Negussie Efa Gurmessa and Catherine Ndinda. (2014). The Role of Loan Guarantees in Alleviating Credit Constraints: Lessons for Smallholder Farmers Cooperatives. International Journal of Business and Social Science Vol. 5, No. 5(1); April 2014

[73] Neil Burton. (2011). EC review of Small Business Act (2011). Retrieved from https://www.finextra.com/blogposting/5029/ec-review-of-small-business-act

[74] Nigrini, M., & Schoombee, A. (2002). Credit guarantee schemes as an instrument to promote access to finance for small and medium enterprises: an analysis of Khula Enterprises Finance Ltd's individual credit guarantee scheme. Development Southern Afica, 19(5), 735-750.

[75] Nitani, M & Riding, A. (2005). Promoting enterprise development or subsidizing tradition? International Small Business Journal, 23(1), 48.

[76] OECD (2016). OECD Territorial Reviews: Córdoba, Argentina. OECD Publishing Paris. Retrieved from http://dx.doi.org/10.1787/9789264262201-en

[77] OECD (2006). The SME Financing Gap (Vol. II) Proceedings of the Brasilia Conference. 27-30 March 2006

[78] OECD. (2004). The SME Financing Gap. Theory and Evidence. Volume I, OECD, Paris. Deelen and Molenaar, 2004.

[79] OECD. (2010). Assessment of Government Support Programmes for SMEs' and Entrepreneurs' Access to Finance during the Crisis, OECD, Paris.

[80] OECD. (2012). Financing SMEs and Entrepreneurs. An OECD Scoreboard 2012, OECD Publishing,

[81] OECD. (2013). Improving access to Finance for SMEs in Central Asia through Credit Guarantee Schemes. Policy Handbook, May 2013.

[82] OECD. (2013). SME and Entrepreneurship Financing: The Role of Credit Guarantee Schemes and Mutual Guarantee Societies in supporting finance for small and medium-sized enterprises. Center for entrepreneurship, SMEs and local development, Final Report, 30-Jan-2013.

[83] Oh et al. (2006). Evaluation of Credit Guarantee Policy using Propensity Score Matching. Small Business, 33.

[84] Oh et al. (2009). The Effect of Mutual Guarantee Consortia and SME Finance. Munich Personal RePEc Archive: 14032

[85] Paola Leone et al. (2012). Credit guarantee Institutions and SME Finance. Palgrave Macmillan studies in banking and financial institutions, 2012, ISBN 978-0-230-29539-1Paris.

[86] Pieda. (1992). Evaluation of The Loan Guarantee Scheme. London: Department of Employment.

[87] Pombo P. (2010). 15 Anos de Evolución de los Sistemas de Garantías Iberoamericano, XV Foro Iberoamericano de Sistemas de Garantía y Financia miento para la Micro y Pyme, Mexico, 30 September −1 October 2010

[88] Pozzolo, A. F. (2004). The Role of Guarantees in Bank Lending. Economics and Statastics Discussion Paper No.21/04, Dept. SEGeS, University of Molise, Italy.

[89] PSZÁF (2013): A részvénytársasági hitelintézetek (MFB, EXIM, KELER nélkül) mikro-, kis- ésközépvállalkozásoknak nyújtott hiteleinek alakulása

[90] Riding et al. (2007). Incrementality of SME Loan Guarantees. Small Business Economics, 29: 47-61.

[91] Riding, A. L. and Haines, G., Jr. (2001). Loan Guarantees: Cost of Default and Benefits to Small Firms. Journal of Business Venturing, 16(6): 595-612.

[92] Roodman, D., & Qureshi, U. (2006). Microfinance as business. Center for Global Development.

[93] Rural Credit Guarantee Foundation: www.avhga.hu

[94] Saadani et al. (2010). A Review of credit guarantee schemes in the Middle East and North Africa region. Financial Flagship, October 2010

[95] Schmidt et al. (2010). Macroeconomic Benefits of German Guarantee Bank's. Institution for Small and Medium-sized Enterprises at University of Trier, Trier, 30 June

[96] Stiglitz, J. E. and Weiss, A. (1981). Credit Rationing in Markets with Imperfect Information. The American Economic Review, 71(3), June: 393-410.

[97] Szerb, L. (2000). Kisvállalati gazdaságtan és vállalkozástan. Pécs: Bornus Nyomda.

[98] Thai Binh Dang. (2016). Assessing the impact of the credit guarantee fund for SMEs in the field of agriculture - The case of Hungary. 4th Central European PhD Workshop on Regional Economics and Business Studies.

[99] Uesugi, I., Sakai K., and Yamashiro, G. M. (2010). The Effectiveness of the Public Credit Guarantees in the Japanese Loan Market. Journal of the Japanese and International Economies 24, 457-480.

[100] Zecchini, S and Ventura, M. (2009). The Impact of Public Guarantees on Credit to SMEs. Small Business Economic, 32: 191-206.

[101] Zsolt Zsombori. (2015). Experiences of lending aimed at the development of small and medium-sized enterprises. PhD Thesis Booklet 2015, p.7

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1. Dang Thai Binh. (2015). Credit guarantee system for SMEs in Vietnam and lessons learned from the success of Japan. Tavaszi Szél 2015 conference, ISBN 978-615-5250-11-8.

2. Dang Thai Binh. (2015). Economic Impact of Credit Guarantee System-Hungarian case study. Theory, Methodology, Practice Journal, Volume 11: 2015, Pages 25-35

3. Dang Thai Binh. (2015). Study on the credit guarantee system: The case of the V4 countries. Challenges in Economic and Technological Development Conference, October 2015, ISBN 978-963-358-100-1

4. Dang Thai Binh. (2015). Credit guarantee system for SMEs in ASEAN: Evidence from Thailand. Indonesia and Malaysia. Managerial Challenges of the contemporary scociety International scientific journal, Vol 8: no1, 2015, ISSN: 2069-4229.

5. Dang Thai Binh. (2015). Challenges for small and medium enterprises of Vietnam in the process of globalization. Small and medium sized enterprises in a globalized world, The International Conference, September 2015.

6. Dang Thai Binh. (2016). Assessing the impact of the credit guarantee fund for SMEs in the field of agriculture - The case of Hungary. 4th Central European PhD Workshop on Regional Economics and Business Studies.

7. Huu Phuoc Dai Nguyen, ZoltÁn Rajnai and Thai Binh Dang. (2016). The impact of E-learning towards small and medium sized enterprise in Vietnam. 3rd International Conference on Finance and Economics, Vietnam June 15th - 17th, 2016.

8.Dang Thai Binh, Hoang T Huong. (2016). The solutions to improve the efficiency of the credit guarantee system for SMEs in Vietnam. the 5th International Conference on Emerging Challenges: Partnership Enhancement, Hanoi University of Science and Technology and Leipzig University (Germany), 2016