



ADB Working Paper Series

**THE ROLE OF CREDIT GUARANTEE SCHEMES IN
THE DEVELOPMENT OF SMALL AND MEDIUM-
SIZED ENTERPRISES WITH AN EMPHASIS ON
KNOWLEDGE-BASED ENTERPRISES**

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Abstract

Small and medium-sized enterprises (SMEs) in their growth stage reach the point where, on the one hand, personal resources do not meet their needs, and, on the other, they do not have enough collateral to attract external finance. Access to finance can be facilitated by obtaining loans from financial institutions backed by governmental credit guarantees. Therefore, the development of a sound credit guarantee scheme will be an important step in filling the financing gap of SMEs.

We investigate the situation of the credit guarantee scheme for SMEs in Iran by using the available data and interviews with activists from this field with the grounded theory method. We show the weaknesses of the Iranian credit guarantee scheme, and based on the analysis, present solutions and policy recommendations in accordance with the social and economic environment of the Islamic Republic of Iran. The most important problem is the lack of a credit database for comprehensive assessment of SMEs, especially knowledge-based enterprises. The lack of a robust database makes it impossible to carry out a comprehensive evaluation because these models require a large amount of data. The lack of accurate models makes it difficult to rate credit status and thus to issue credit guarantees. In addition, the current level of the capital of the credit guarantee funds in Iran is not sufficient given the large number of SMEs in the country.

Keywords: small and medium-sized enterprises (SMEs), knowledge-based enterprises, credit guarantee scheme (CGS), comprehensive credit evaluation

JEL Classification: G32, H81, C52, O1

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1. INTRODUCTION

Iran has a developing economy. According to the Global Competitiveness Report (GCR)¹, development consists of three main and two transition phases. The three main phases are: factor-driven development, efficiency-driven development, and innovation-driven development. With regards to the aforementioned report (Schwab and Sala-i-Martin 2017), Iran has passed the first and intermediate (transition) phases; the country is currently passing through the efficiency-based stage of development. Thirty countries, including the People's Republic of China (PRC) and Brazil, are currently in the same stage. A recent report at the World Economic Forum shows that the global competitiveness index of Iran has reached 76, with seven steps of improvement compared to the two previous years (Schwab and Sala-i-Martin 2017).

According to a census report (2002), more than 99% of enterprises have had between one and 50 employees. Currently, no other census report exists; however, data and evidence show that no tangible change has been made so far. These enterprises are one of the main driving forces of employment and value added in the Iranian economy, and likewise the rest of Asia. They should cooperate with large companies as suppliers in their value chain to bring about competitiveness and macroeconomic growth. According to Yoshino and Taghizadeh-Hesary, Charoensivakorn, and Niraula (2016), Yoshino and Taghizadeh-Hesary (2015), Baghdadi et. al (2014), Yoshino and Taghizadeh-Hesary (2014), and Yoshino and Taghizadeh-Hesary (2017) these enterprises are confronting finance gaps, because they are developing but they may not be financed due to their lack of ability to provide guarantee and collateral, which endangers their growth in many developing economies including Iran.

Filling the gap needs policy and institutionalization leads to enhancing the credit status of these companies. Credit rating institutions, credit risk databases, comprehensive technical and financial evaluations, and credit guarantee corporations/funds are all considered solutions adopted by various countries to solve the problem.

In this chapter, the role of small and medium-sized enterprises in the Iranian economy will be discussed. Different dimensions of the influence on the Iranian economy of these industries will be explained. Since the early 2000s, policy makers have paid attention to the knowledge economy in Iran. The most important reason for this was the transition from the oil economy to a knowledge-based economy. Therefore, this issue was noted in the third Five-Year development plan and followed by a permanent law. The term "knowledge-based economy" stems from this fuller recognition of the place of knowledge and technology in the economy, an economy that is directly based on the production, distribution, and use of knowledge and information (OECD 1996). The increasing role played by knowledge-based companies in Iran stems from supportive development policies adopted by the Iranian government during the past five years, based on the law on protection of knowledge-based companies. Section three has been allocated to a review of the status of these companies. Section four deals with the Iranian credit guarantee scheme and its analysis by emphasizing knowledge-based companies. Finally, some strategies for strengthening and modifying the system have been proposed, taking into consideration the analysis performed, which is also applicable to, and useful for, the rest of developing Asia.

¹ The Global Competitiveness Report (GCR) is published by the World Economic Forum within the framework of the System Initiative on Shaping the Future of Economic Progress.

2. THE ROLE OF SMES IN THE IRANIAN ECONOMY

2.1 Definition of an SME in Iran

The definition of an SME in Iran varies from one organization to another. Various organizations have defined the size of enterprises (small, medium, large) based on their own work requirements. Some definitions are provided in the following table:

Table 1: Definition of an SME in Iran

Institution	Definition	Source
Cabinet ^a	Those enterprises with less than 50 employees are called SMEs	Cabinet decree ^b
Statistical Center of Iran	Enterprises classified into four groups according to the number of employees: micro (1–9), small (10–49), medium (50–99), and large (more than 100)	Statistical Center of Iran, Statistical Yearbook 2015 (1394)
Central Bank of Iran	Micro (less than 10), small (10–49), medium (50–99), and large (more than 100)	Central Bank Instruction ^c

^a The definition provided by the Cabinet has been used by both the Ministry of Industry, Mine, and Trade and the Ministry of Agriculture.

^b The Cabinet decree titled “Circular addressed to all administrative organizations regarding exclusion of companies subject to funding instruction of small and medium size enterprises,” No. 53097/18549, dated 8 May 2016.

^c Central Bank Instruction titled “Instruction on funding small and medium size enterprises,” No. 96/81160, dated 10 June 2017.

Source: Cabinet decree, Statistical Center of Iran, Statistical Yearbook 2015 (1394), Central Bank Instruction.

For example, Table 2 shows the definition of SMEs in Japan:

As can be seen in the table, various organizations have provided different definitions of SMEs in Iran. In developed countries, however, the definition is set by law. From among the aforementioned organizations, the “Iran Small Industries and Industrial Parks Organization” oversees SMEs. So the definition is expected to be provided by the same organization, and other organizations have to use the definition, as this is the first and most important required step when the government wants to support the SME sector. On the other hand, definitions provided in Iran are just based on the number of employees. However, in many other countries, such as Japan, the US, and Germany (OECD 2005), different indexes such as sales volume, amount of assets, capital, number of employees, and even categorization based on the field of activity are used.

**Table 2: Example: Definition of SMEs in Japan
(Based on Number of Employees, Capital for Each Field of Activity)**

Industry	Capitalization	Number of Employees
Manufacturing, etc.	Up to \$3 m	300 or less
Wholesale	Up to \$900 k	100 or less
Retail	Up to \$450 k	50 or less
Services	Up to \$450 k	100 or less
Health care, etc.	–	300 or less

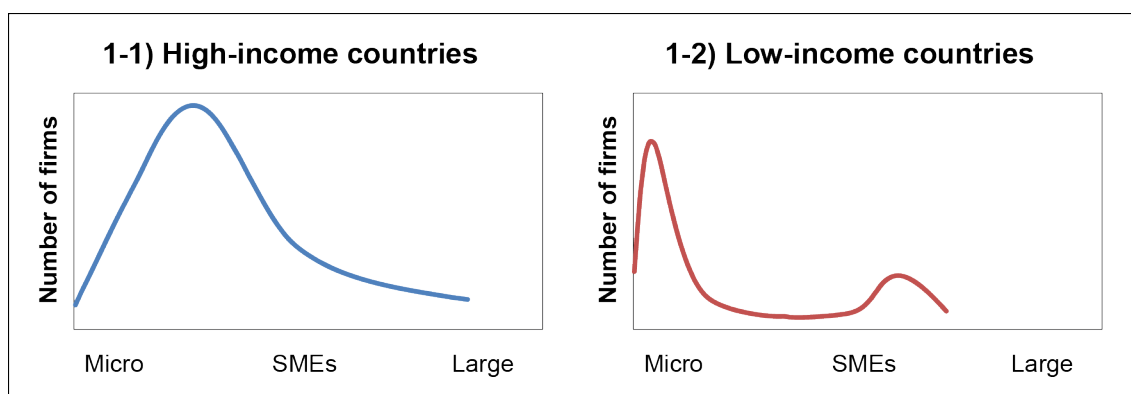
Source: JFG (2014).

2.2 Statistics of SMEs in Iran

In this section, using official public statistics, the status of SMEs in Iran will be analyzed. Then, taking into consideration the Iranian industry structure, a brief analysis will be provided regarding the above status. To evaluate the status of such enterprises, the concept of “missing middle” will be presented. Accordingly, the status of SMEs in Iran will be studied. Then, the evaluation will be completed through the following criterion: the value-added percentage of SMEs compared to the economy’s total value added.

If there are a lot of micro and small companies and a few medium companies it shows that companies cannot grow easily. This is due to a variety of reasons, and Beck notes that they are more constrained by financing and other institutional obstacles than large enterprises, exacerbated by the weaknesses in the financial systems of many developing countries (Beck 2007). The lack of medium-sized companies in less developed countries is called the “missing middle” (Advance Global Capital 2015). Figure 1 clearly shows the concept of the missing middle.

Figure 1: “Missing Middle” in Low-income Countries



Note: SMEs = small and medium-sized enterprises

Source: Advance Global Capital, Ltd (AGC) 2015.

Table 3 and Figure 2 show the status of statistics related to the number of industrial enterprises in Iran, in small, medium, and large size categorization:

According to the definition of the Statistical Center of Iran (Table 1) regarding the size of enterprises, the missing middle is obvious in the industrial structure of production in the country based on Table 3 and Figure 2. Occurrence of the missing middle means that many micro and small businesses are not capable of surviving safely in the business environment of the country and are unable to grow to become medium-sized. Hence, considerable numbers of them will be removed from industrial production. This defective mechanism occurs due to numerous obstacles existing in the business environment (Mostafazadeh 2015).

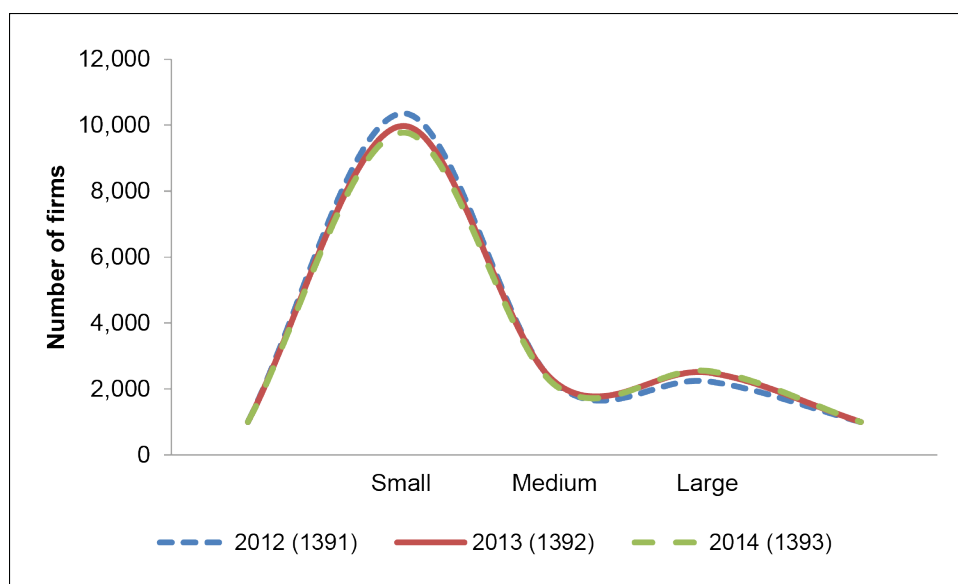
Table 3: Number of Industrial Enterprises in Iran Based on Size

Year	Overall Number of Employees		
	10–49 Employees Small	50–99 Employees Medium	100 and More Employees Large
2006 (1385)	12,151	1,856	2,050
2010 (1389)	10,711	2,229	2,361
2011 (1390)	10,481	2,138	2,343
2012 (1391)	10,355	2,200	2,232
2013 (1392)	9,973	2,225	2,499
2014 (1393)	9,772	2,132	2,548

Note: The years in parenthesis are Iranian calendar year (Hijri Shamsi) and the years out of parenthesis are Gregorian calendar year.

Source: Statistical Yearbook of Statistical Center of Iran (2006–2015).

Figure 2: Schematic View of Missing Middle in Iranian Enterprises (2012–2014)



Note: The figure is based on the Statistical Center of Iran’s definition of SMEs.

Source: Statistical Yearbook of Statistical Center of Iran (2006-2015).

The percentage of value added in SMEs, compared to the total value added in the industry sector, is also considered another important criterion for the evaluation of SME status in an economy. The ratio in the Iranian economy and during recent years has been about 14%, which shows the insignificant role played by industrial SMEs. Table 4 shows the share of SMEs in the total production value added in Iran. The ratio for a country such as Germany has been 53% on average during recent years (SBA 2017).

Table 4: Value Added Share of SMEs and Large Enterprises in Iranian Economy

Year	Ratio of Value Added of SMEs in Total Value Added of the Economy	Ratio of Value Added of Large Enterprises in Total Value Added of the Economy
2005 (1385)	0.14	0.86
2007 (1386)	0.15	0.85
2009 (1388)	0.14	0.86
2010 (1389)	0.14	0.86
2011 (1390)	0.15	0.85
2012 (1391)	0.15	0.85
2013 (1392)	0.12	0.88
2014 (1393)	0.13	0.87

Note: The years in parenthesis are Iranian calendar year (Hijri Shamsi) and the years out of parenthesis are Gregorian calendar year.

Source: Statistical Yearbook of Statistical Center of Iran (2006–2015).

3. STATUS OF KNOWLEDGE-BASED ENTERPRISES IN IRAN

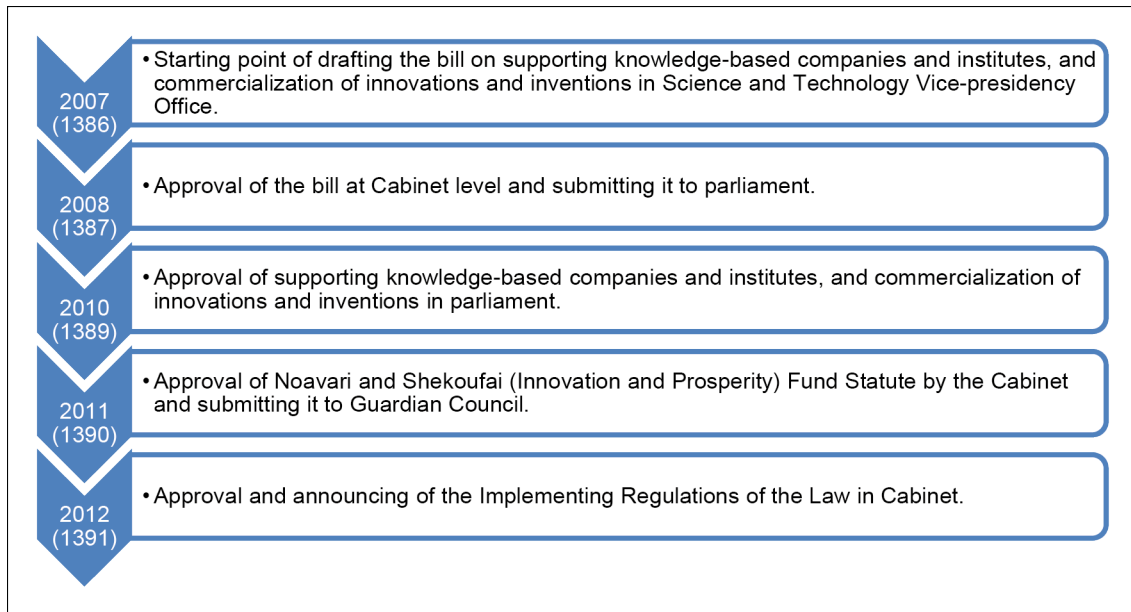
The knowledge-based economy has been taken into consideration seriously by authorities in the I.R. of Iran since the 1990s, and several measures have been taken by the government and the parliament to support the knowledge-based economy. With the progress of government initiatives, high-tech SMEs play an increasingly important role in the development and innovation of a country. However, the financing of the high-tech SMEs, which are known as “knowledge-based enterprises” in Iran, faces a serious market failure, and the government has to intervene.

Education plays a driving role in promoting the knowledge economy. Universities are seen as key drivers towards the knowledge economy (Peters 2003). In Iran, the number of university students increased from 250,709 in 1988 (1367)² to 4,802,721 in 2017 (1396) (Statistical Center of Iran, 1394). During the 1380s, research was also taken into consideration; so research programs at universities and higher education institutes were expanded. From the late 1380s, innovation became the center of interest, and knowledge-based law emerged (UNCTAD 2016), as briefly presented in Figure 3:

In accordance with the law, knowledge-based companies have been defined, and a special workgroup has been formed in the Vice-Presidency for Science and Technology for the competency of these companies to be verified. These companies are divided into three knowledge-based types of companies – i) startups, ii) production, and iii) industrial companies – with financial, tax, and even customs support specified for each. The number of incentives provided to knowledge-based companies reaches 110, as explained by the Vice-Presidency for Science and Technology in a book titled *110 Programs in Support of Knowledge-Based Companies* (Vice-Presidency for Science and Technology 2017 (1396)). Statistics related to these companies will be presented.

² Years outside parentheses are based on Solar Hijri years and years inside parentheses are based on the Gregorian calendar. In Solar Hijri, the year begins on 21 March.

Figure 3: Process of Approval and Announcing of the Support of Knowledge-based Companies Act



Source: National System of Laws and Regulations of the Islamic Republic of Iran. <http://dotic.ir/Home> (accessed 20 May 2018).

The Iranian authorities taking the knowledge-based economy into consideration during the past few years has resulted in the development of such activities, especially in the nanotechnology sector, and currently more than 3300 knowledge-based enterprises are active in various fields. They are categorized into startup, production, and industrial enterprises. Table 5 shows the number of knowledge-based enterprises separated based on such a categorization in 2017.

Table 5: Number of Knowledge-based Enterprises in Iran, 2017

Knowledge-based Startups ^a	Knowledge-based Production Enterprises ^b	Knowledge-based Industrial Enterprises ^c	Total Number of Knowledge-based Enterprises
1,722	835	793	3,350

^a Enterprises that have produced goods or services at the prototype level and have not yet received operating revenues.

^b At least 50% of the enterprises' operating income is from the sale of knowledge-based products.

^c Knowledge-based enterprises that have at least one engineering, contracting, and manufacturing project.

Source: The Schedule of Evaluation of Knowledge Companies 2018. <http://daneshbonyan.isti.ir/index.aspx?siteid=2&fkeyid=&siteid=2&fkeyid=&siteid=2&pageid=2994>. Accessed: 20 May 2018.

Source: Performance Report of Vice-Presidency for Science and Technology 2018.

To explain the performance of such enterprises, statistics published by related organization institutions must be referred to. Table 6 shows the statistics of the sales of knowledge-based enterprises in Iran:

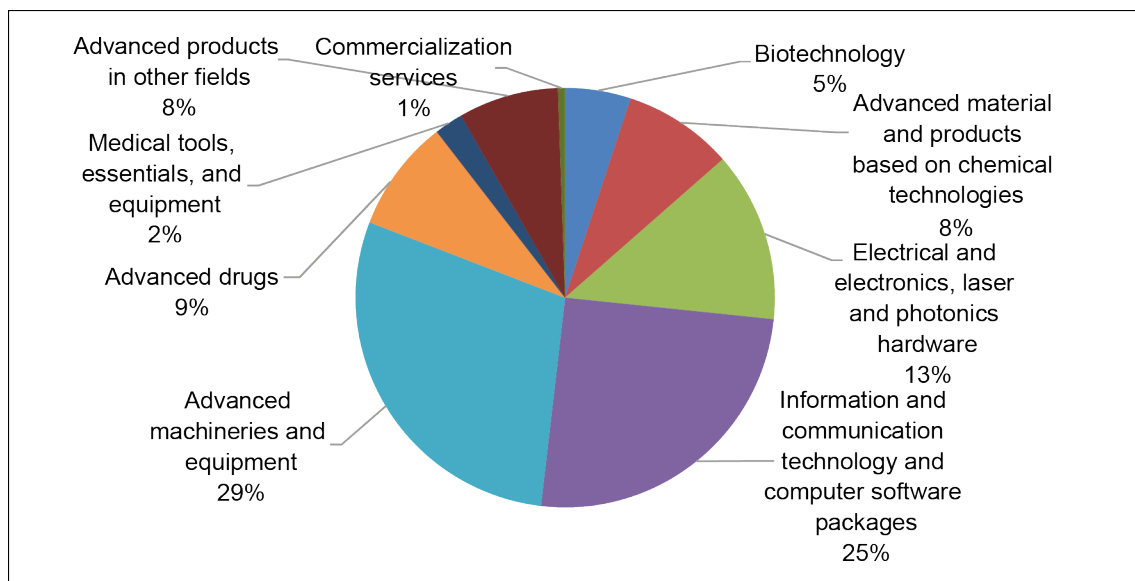
Table 6: Sales of Knowledge-based Enterprises in Iran (2013–2017)

Year	Total Amount of Sales of Knowledge-based Enterprises (IRR billion)
2013 (1392)	2,563
2014 (1393)	32,399
2015 (1394)	123,975
2016 (1395)	202,606
2017 (1396)	221,409

Source: Performance Report of Vice-Presidency for Science and Technology 2018.

Figure 4 also shows the statistics of the employment of knowledge-based enterprises by sector of activity. The figure shows that the information and communication technology and computer software packages and advanced machineries and equipment have higher employment rates than other sectors of knowledge-based companies.

Figure 4: Statistics of Knowledge-based Company Employment in Each Activity Sector

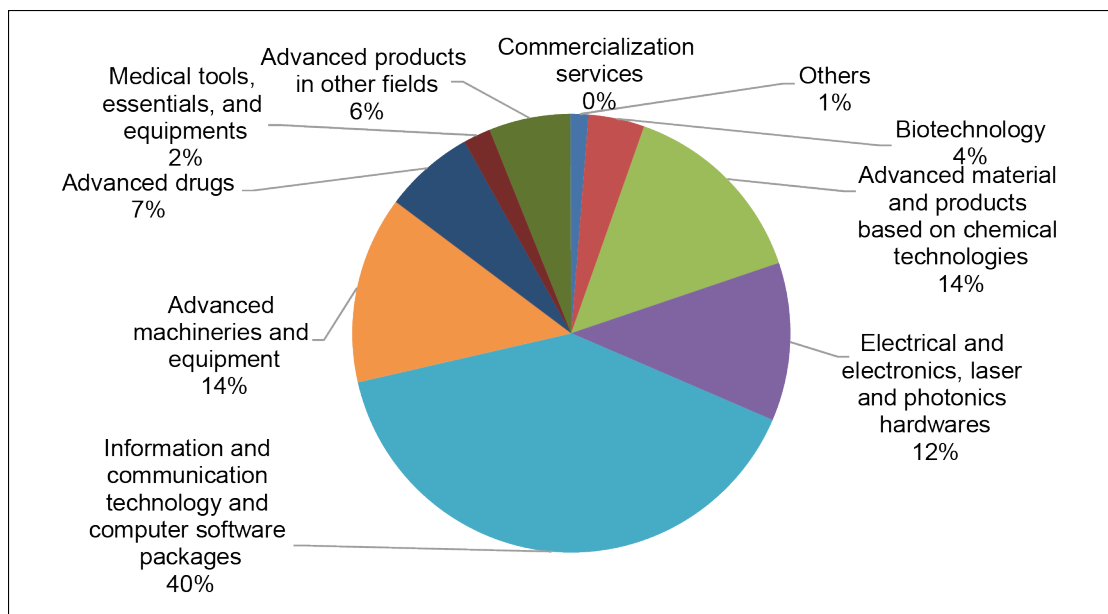


Source: Performance report of Vice-Presidency for Science and Technology 2017.

As shown in Figure 4, the companies were divided into nine main sectors. Figure 5 shows the production share of each of these sectors in the knowledge-based economy:

The above statistics show the formation of the knowledge-based economy in Iran, especially in the IT and biotechnology sector; however, the knowledge-based economy boom in Iran and the country entering the innovation development phase need considerable growth of activities performed by knowledge-based companies.

Figure 5: Production Share of Knowledge-based Companies in Knowledge-based Economy



Source: Performance Report of Vice-Presidency for Science and Technology 2017.

Although a lot of support is provided by the government to this kind of company compared to other companies, the current status of knowledge-based enterprises in the Iranian economy in comparison to the purpose of the government is not satisfactory. The reason is that there are still several obstacles existing for the growth of this sector. From now on, the government needs to target support and make it more effective and efficient. Among the financial obstacles are firstly the lack of collateral due to intangible assets in these companies and many banks are reluctant to lend to this sector because of the high existing risk (from the banks' point of view); and secondly, the lack of an efficient credit guarantee scheme (CGS) because of the major difficulties in accessing finance for startups and knowledge SMEs.

In Iran, banks dominate the financial system, so facilitating access to bank resources may play a more important role in financing these companies. In 2015, 94% of the domestic finance in Iran was provided by banks and the share of the capital market was only 6%.³

Therefore, one policy in support of enterprises is facilitating accessibility to bank resources. One of the important strategies in this respect is developing a credit guarantee scheme. As SMEs are not very capable of providing guarantees, facilitating the accessibility of such enterprises to bank resources by government-backed guarantees will secure their growth. SMEs make up 82.8% of the total number of enterprises in Iran (Statistical Center of Iran 2015). Despite such a big share in the economy, there is just one governmental fund specialized in SMEs (Small Industries Investment Guarantee Fund) with just IRR500 billion (about \$12 million approximately) capital that issues guarantees for SMEs (Small industries investment guarantee fund 2016) and 14 nongovernmental research and technology funds with overall IRR795 billion (\$19 million approximately) capital that issue guarantees for knowledge-based companies (Iranian Venture Capital Association Report 2017). Therefore, it should be

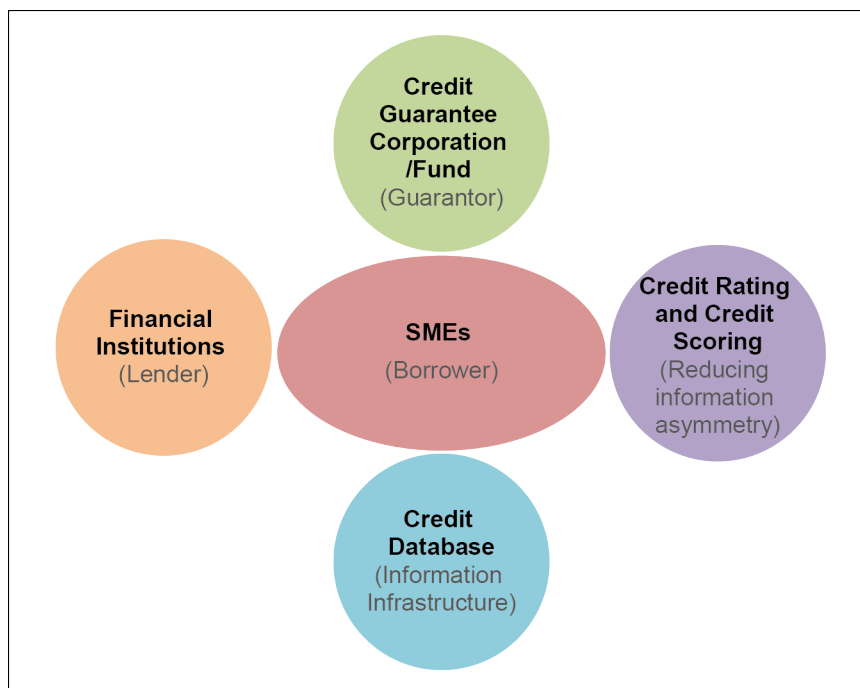
³ Economic time series databank of the Central Bank of Iran and Performance Report of the Capital Market Central Asset Management Co. 1395 (2016).

noted that one of the requirements is increasing governmental support, through the development of guarantee institutions with sufficient capital.

4. STATUS OF SME CREDIT GUARANTEE SCHEME (CGS) IN IRAN

Analysis of the financing system of SMEs and specifically knowledge-based companies includes several main actors. These main actors are SMEs, a credit database, financial institutions (banks, capital market, etc.), a credit rating agency, and finally a credit guarantee fund/corporation (Figure 6). In some countries like Japan, the function of credit rating/credit scoring and a credit database are run by the same entity, which is the so-called Credit Risk Database (CRD) (Kuwahara et al. 2016). The guarantees that are needed by firms include contractual guarantees (such as performance bonds, advance payments, and tenders), credit guarantees, investment guarantees, and export guarantees.

Figure 6: Players of the Credit Guarantee Scheme (CGS)

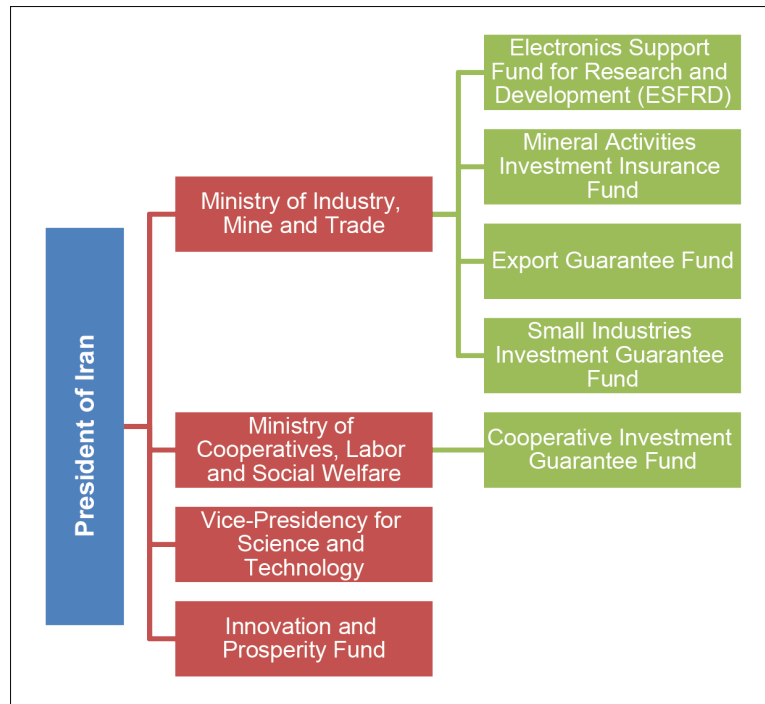


Note: SME=small and medium-sized enterprise.

Source: Authors' compilation.

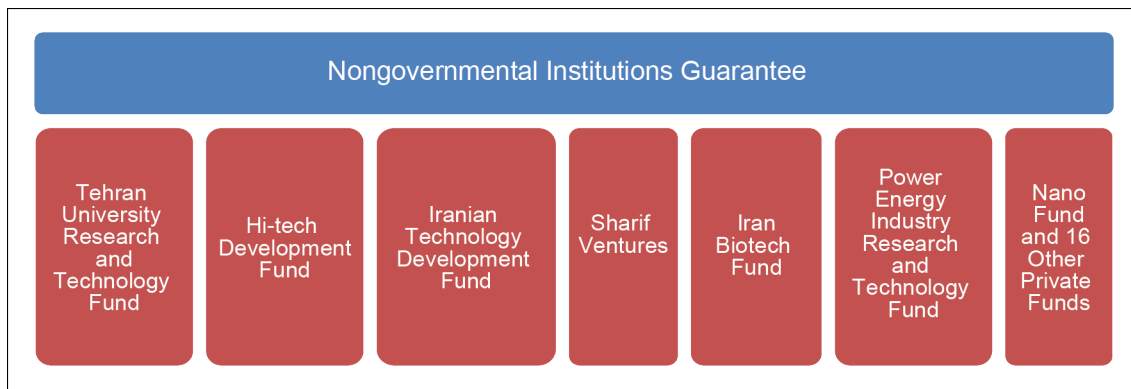
Due to the focus on guarantees in this chapter, reviews are merely focused on credit guarantees. Meanwhile, the institutional status of governmental and nongovernmental guarantees will be dealt with. The credit guarantee scheme (CGS) in Iran can be defined with two sets of institutions included. One of them may be considered as the governmental guarantee institution, and the other may be the set of nongovernmental institutions. Figure 7 shows the hierarchy of governmental institutions responsible for guarantees in Iran and Figure 8 shows the nongovernmental guarantee institutions in Iran.

Figure 7: Hierarchy of Governmental Institutions Responsible for Guarantees in Iran



Source: Authors' compilation.

Figure 8: Nongovernmental Institutions Responsible for Guarantees



Source: Authors' compilation.

Each of the nongovernmental funds has been established according to the Islamic Republic of Iran Development Laws and based on the need in various time periods. However, there is no upstream supervisory institution for them. These funds operate based on their own articles of associations, and they are responsible for their own board of custodians. Their performance will be explained clearly in the next section. Nongovernmental funds have been permitted to be established according to Article 100 of the Law on the third Five-Year Development Plan for the Islamic Republic of Iran, and Article 45 of the fourth Economic and Sociocultural Development Plan for the Islamic Republic of Iran. Their scope of activities includes providing services like loans, guarantees, investment, and brokerage. Some of the funds have been focused on guarantee services, analysis of which will also be provided in the next section.

5. THE ROLE OF CGSS IN ADDRESSING GAPS IN SME FINANCING IN IRAN

Currently in Iran lending to SMEs is mainly based on receiving land as collateral. These enterprises face big problems in terms of providing such guarantees. Therefore, a credit guarantee is used as a factor for correcting the process and filling the gap.

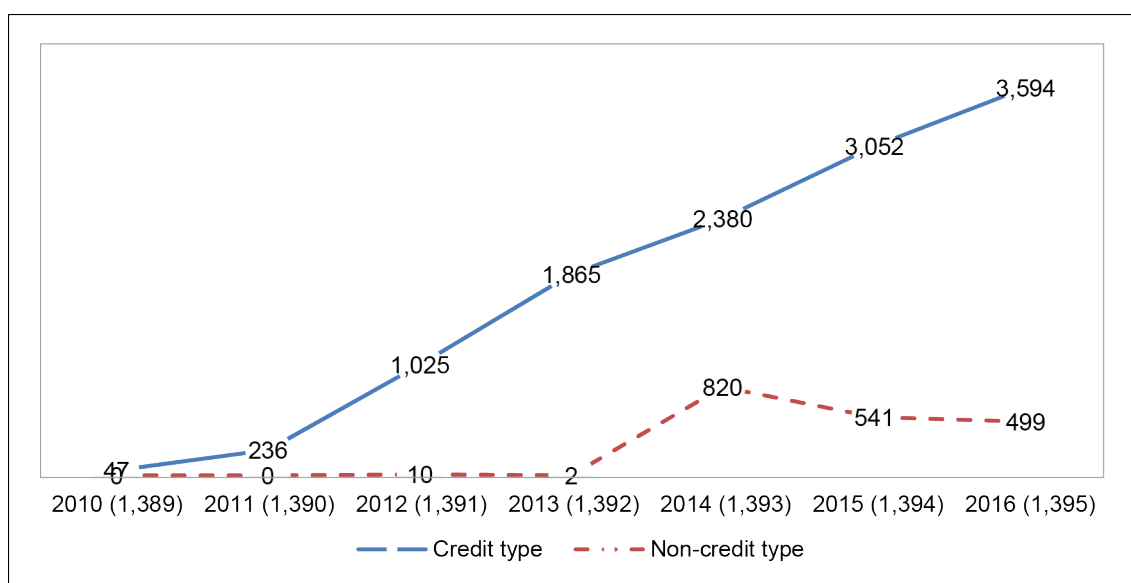
To study the role of a CGS in removing the financial gap, letters of guarantee (L/Gs) issued by them have to be reviewed. Since guarantee funds usually issue other types of guarantees in addition to credit guarantee, these types have also been dealt with. Other types of guarantees also help in reducing the financing gap for SMEs. In this section, the role of governmental and nongovernmental funds will be studied.

5.1 Role of Governmental Funds in the Guarantee Scheme of Iran

5.1.1 Cooperative Investment Guarantee Fund

The fund was established with the aim of developing the cooperative sector in the Iranian economy, and achieving better accessibility of the country’s cooperatives to credit, especially through the Cooperative Development Bank (Tose’e Ta’avon Bank), which operates under the supervision of the Ministry of Cooperative, Labor and Social Welfare. The capital of this fund is IRR2,400 billion (\$5.7 million approximately), of which IRR1,200 billion have been paid. Therefore, this fund has a guarantee of IRR12,000 billion (capital adequacy of 10%). Thus, the fund is considered to be one of the most important governmental guarantee funds in Iran. Figure 9 shows the amount of guarantees issued by this fund, separated by guarantee type (credit or noncredit) from 2010 until 2016. The fund is mainly focused on the scope of credit guarantee.

Figure 9: Amount of Guarantees Issued by Cooperative Fund by Their Types (IRR billion)



Note: IRR = Iranian rial, US\$1 = IRR42,000 (April 2018 fixed exchange rate policy); the years in parenthesis are Iranian calendar year (Hijri Shamsi) and the years out of parenthesis are Gregorian calendar year. In Solar Hijri, the year begins on 20 March.

Source: Performance report of Cooperative Investment Guarantee Fund 2018.

5.1.2 Small Industries Investment Guarantee Fund

The other fund is the Small Industries Investment Guarantee Fund, which is under the supervision of the Ministry of Industry, Mine and Trade, and especially supports the small and medium-sized industrial enterprises (SMIEs). This fund currently operates with a capital of IRR500 billion (\$12 million approximately). At the beginning of its activity, it was responsible for providing a credit guarantee for part of the collateral for SMIEs to bank. To overview the performance of the “Small Industries Investment Guarantee Fund”, statistics related to issued guarantees separated by amount and number can be seen in Table 7. From the beginning of its activity in 2007 (1386) until now, various types of guarantees equal to about IRR4,800 billion (\$114 million approximately) have been issued by the fund. Meanwhile, about IRR2,800 billion (\$66 million approximately) of them is related to the 5 years under study leading up to 2016 (1395). The number of issued guarantees has significantly increased since 2014 (1393).

Table 7: Guarantees Issued Separated by Number and Amount

Year	Number of L/Gs	Amount of L/Gs (IRR million)
2012 (1391)	20	156,890
2013 (1392)	29	154,905
2014 (1393)	57	201,242
2015 (1394)	252	982,959
2016 (1395)	233	1,286,395

Note: L/G = letter of guarantee, IRR = Iranian rial, US\$1 = IRR42,000 (April 2018 fixed exchange rate policy). The years in parentheses are based on the Solar Hijri (Hijri Shamsi, Iranian calendar) calendar and the years outside of the parentheses are based on the Gregorian calendar. In Solar Hijri, the year begins on 20 March.

Source: Performance report of Small Industries Investment Guarantee Fund 2017.

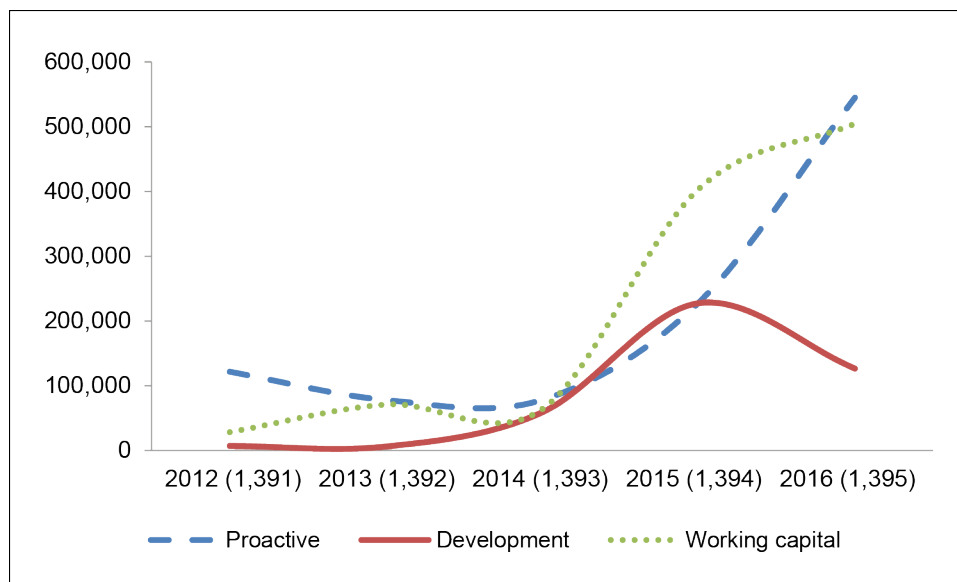
Such growth in the issuance of L/Gs was more focused on working capital, while it dealt less with fixed capital. The focus on loans based on working capital continued until 2016 (1395), with the aim of eliminating the financial problems of SMIEs. The fund began its activity in contractual guarantees in 2015 (1394), so it had a lower share in the guarantee portfolio of the fund. Similarly to a “cooperative investment guarantee fund,” this fund also seeks to issue credit guarantees. This process can be seen in the following figure.

In view of the need to provide other guarantees for SMEs, the fund has issued noncredit guarantees since 2015, as shown in the following table:

5.1.3 Electronics Support Fund for Research and Development (ESFRD)

The Electronics Support Fund for Research and Development (ESFRD) is another governmental fund active in the field of guarantee issuance. The Electronics Support Fund for Research and Development, affiliated to the Ministry of Industry, Mine and Trade, is a 100% governmental entity, whose law was passed in 1997 and its statute was approved by the Cabinet of Ministries in 1998. The fund began its activities by awarding grants or loans at preferential rates to natural or legal persons with a focus on venture capital and expert services and financial and credit support for the research and development of the electronic industry in private and cooperative sectors.

Figure 10: Credit Guarantees Issued by Type
(IRR million)



Note: L/Gs refer to credit guarantees issued for proactive, development, and working capital loans.

An establishment loan is a loan used to start a business.

A development loan is a loan used to develop the new plan of a company.

IRR = Iranian rial, US\$1 = IRR42,000 (April,2018 fixed exchange rate policy).

Source: Performance Report of Small Industries Investment Guarantee Fund 2017.

Table 8: Amount of Noncredit Issued L/Gs Based on Type of Guarantee
(IRR million)

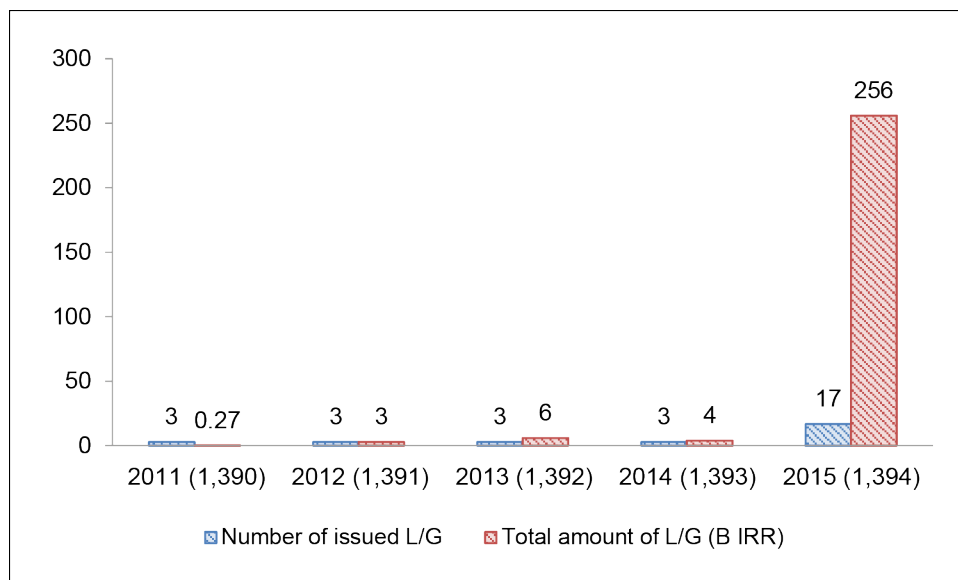
Type of Guarantee	Buyer's Credit	Advance Payment	Performance	Tender
Year 2015 (1394)	75,100	24,505	17,619	5,740
2016 (1395)	29,430	39,214	23,494	18,148

Note: L/G = letter of guarantee, IRR = Iranian rial, US\$1 = IRR42,000 (April,2018 fixed exchange rate policy). The years in parentheses are based on the Solar Hijri (Hijri Shamsi, Iranian calendar) calendar and the years outside of the parentheses are based on the Gregorian calendar. In Solar Hijri, the year begins on 20 March.

Source: Performance Report of Small Industries Investment Guarantee Fund 2017.

Before 2015, the fund was not very focused on guarantees; however, since then and through changing business policies, it has rendered services such as the issuance of credit and contractual guarantees. In the same year (2015), the fund issued about IRR265 billion (approximately \$6.3 million) of guarantees.

Figure 11: Number and Amount of L/Gs Separated by Year of Issuance



Note: L/Gs = letter of guarantee, IRR = Iranian rial, US\$1 = IRR42,000 (April 2018 fixed exchange rate policy). The years in parentheses are based on the Solar Hijri (Hijri Shamsi, Iranian calendar) calendar and the years outside of the parentheses are based on the Gregorian calendar. In Solar Hijri, the year begins on 20 March.

Source: Performance Report of ESFRD 2016. <http://www.esfrd.ir/fa/entesharat> (accessed 20 May 2018).

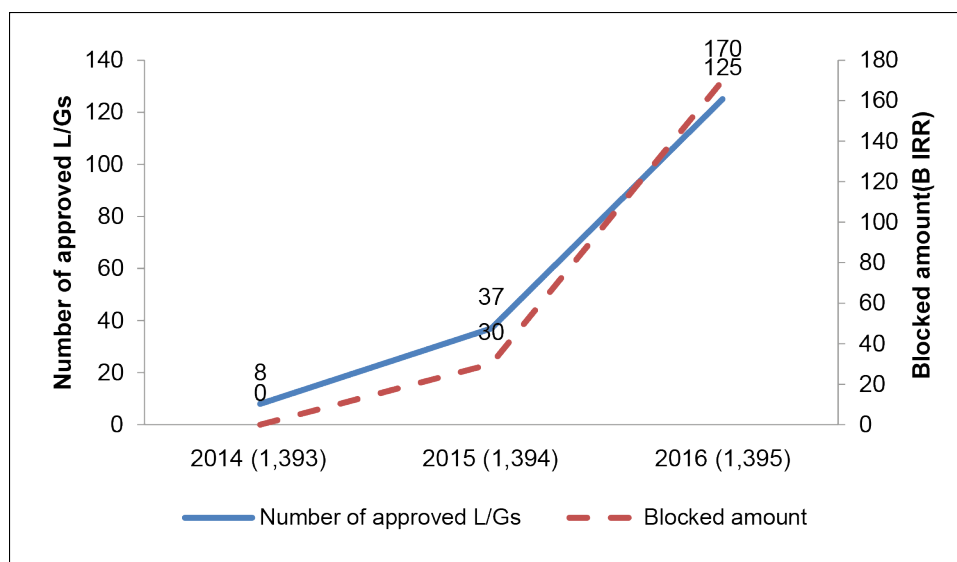
5.1.4 Innovation and Prosperity Fund

The Innovation and Prosperity Fund (Noavary and Shekoufaie) is another governmental fund based on the Knowledge-based Company Act.⁴ The capital of this fund is IRR30,000 billion (\$714 million approximately) and it is under the presidency of the I.R. of Iran (Innovation and Prosperity Fund 2016).

It has deposited an amount equal to IRR1,000 billion (\$24 million approximately) in some Iranian banks, and they issue guarantees in two forms of risk taking and leveraging. Taking a risk equal to IRR200 billion (\$5 million approximately), it has issued 170 L/Gs with a value of IRR1000 billion (\$23 million approximately). In addition to risky guarantees, 127 leveraging guarantees equal to IRR630 billion (\$15 million approximately) have been issued by the fund for knowledge-based companies. During the period 2014–2016, the following procedure was used for the issuance of guarantees:

⁴ Knowledge-based Company Act 1389 (2010). Number 258/57953. Islamic Consultative Assembly of I.R. Iran.

Figure 12: Number of Guarantees and the Related Amount of Deposit



Note: The years in parentheses are based on the Solar Hijri (Hijri Shamsi, Iranian calendar) calendar and the years outside of the parentheses are based on the Gregorian calendar. In Solar Hijri, the year begins on 20 March.

Source: Performance report of Innovation and Prosperity Fund 2017.

5.1.5 Mineral Activities Investment Insurance Fund

The Mineral Activities Investment Insurance Fund is also affiliated to the Ministry of Industry, Mine and Trade. The fund was established to facilitate mineral activities. The fund’s current capital amounts to IRR724 billion (\$17 million approximately) (Information site of the Investment Fund for Mining Activities 1396).

This fund covers part of or all unintentional losses imposed on mineral activities during all stages of exploration, mining, ore preparation, and processing. It also guarantees all or part of loans received by investors in the mining sector, through the issuance of a credit insurance policy, while it has covered the majority of risks and losses in this sector. The fund receives a premium so that losses incurred by investors in terms of mineral activities will be covered.

5.1.6 Export Guarantee Fund of Iran

The Export Guarantee Fund of Iran was established in 1973 (1352) in cooperation with the United Nations Conference on Trade and Development (UNCTAD), with the aim of ensuring the financial safety of Iranian exporters, which has resulted in the effective development of nonoil exports of the country. This is the only governmental fund active in the field of export credit insurance. The fund is affiliated to the Ministry of Industry, Mine and Trade, and its activities are supervised by the Export Development Center of Trade Promotion Organization of Iran. The capital of this fund is currently more than IRR1,000 billion (\$24 million approximately).

Reviewing the performance of governmental funds in the field of guarantees shows that in practice the two following funds have been formed mainly with the aim of providing credit guarantees: the Cooperative Investment Guarantee Fund and the Small Industries Investment Guarantee Fund.

The ESFRD is responsible for other tasks such as granting loans, and investment, while the Mineral Activities Investment Insurance Fund and the Export Guarantee Fund of Iran mainly play an insurance role. A look at these funds’ capital shows that the amount of

loans needed by enterprises surpasses the financial strength of these funds. In fact, sometimes guarantees issued by these funds are not accepted in the financial system of Iran (banks). Therefore, these funds must be supported in legal and capital terms; however, it can be seen that a privatization approach has been taken towards them, and that will make the situation tougher. Of course, in the laws of I.R. Iran, developmental organizations are excluded from this approach; however, guarantee institutions are not included in this exclusion. The supportive mission of these institutions in addition to the success of governmental guarantee plans in some countries, such as the Republic of Korea and Japan, show the necessity for such institutions not to become privatized. Although private sectors are permitted to be active in the field of guarantees, considering supportive approaches through an efficient guarantee tool becomes possible through governmental guarantee funds. Therefore legislators in Iran must modify the law so that governmental guarantee funds can also be included in developmental organizations, in addition to the need for the capital of these funds to be increased in order to be sufficient to support the development of SMEs in the Iranian economy.

5.2 Role of Nongovernmental Research and Technology Funds in Reducing the Financing Gap

These funds were established according to Article 100 of the Law on the third Economic and Sociocultural Development Plan for the Islamic Republic of Iran (1380–1384/2001–2005) with the aim of creating appropriate ground for partnership and investment of nongovernmental sectors in the research and technology scope of activities, boosting commercialization, creating new businesses with high value added in various fields of advanced technologies, etc. They were created based upon a partnership between the government (up to 49%) and the private sector. Table 9 shows the number of L/Gs issued by these funds, and the total amount guaranteed.⁵ From among those funds studied, three funds have issued more than 80% of guarantees (in terms of value). The statistics show that a few funds have focused on guarantee issuance from among 14 active nongovernmental funds. Others have been mainly focused on other services such as granting loans, leasing, etc. One of the reasons is the expertise created in these funds as with the issuance of guarantees.

Table 9: Number and Value of L/Gs Issued by Nongovernmental Research and Technology Funds

Year	Number	Volume (IRR million)
2012 (1391)	217	336,474
2013 (1392)	588	738,435
2014 (1393)	912	1,869,199
2015 (1394)	577	1,436,299
2016 (1395)	713	1,040,617
Total	3,007	5,32,954

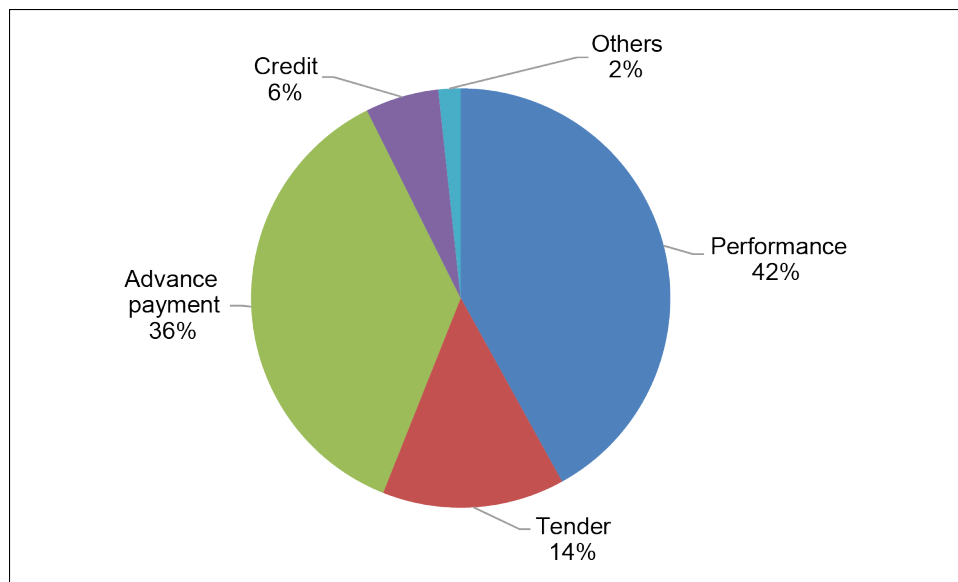
Note: L/G = letter of guarantee, IRR = Iranian rial, US\$1 = IRR42,000 (April 2018 fixed exchange rate policy). The years in parentheses are based on the Solar Hijri (Hijri Shamsi, Iranian calendar) calendar and the years outside of the parentheses are based on the Gregorian calendar. In Solar Hijri, the year begins on 20 March.

Source: Performance Report of Iranian Venture Capital Association.

⁵ Names of funds are not mentioned for confidentiality reasons.

The types of guarantees issued by these funds are among other issues to be studied in this respect. The composition of guarantees issued by these funds is shown in Figure 13. Among nongovernmental funds, the percentage of performance guarantees issued has been the highest, followed by advance payment and finally tender and credit guarantees, respectively. The guarantee for advance payment on average has the lowest commission cost among other types of guarantees issued. This type of guarantee has a slight income and increases the risk of the fund by the same amount it has increased.

Figure 13: Ratio of Various Guarantees Issued by Nongovernmental Research and Technology Funds



Source: Performance Report of Iranian Venture Capital Association.

6. EMPIRICAL ANALYSIS OF THE CREDIT GUARANTEE SCHEME IN IRAN

In previous sections, a description of institutions involved in credit guarantee in Iran has been provided. Each of these institutions, whether in the public or private sector, has some functions that will be analyzed. For empirical analysis, grounded theory has been used as the research method (Appendix). Accordingly, and through interviews and qualitative data collection, a pathology of the current status has been made. Then, policy recommendations and solutions have been presented.

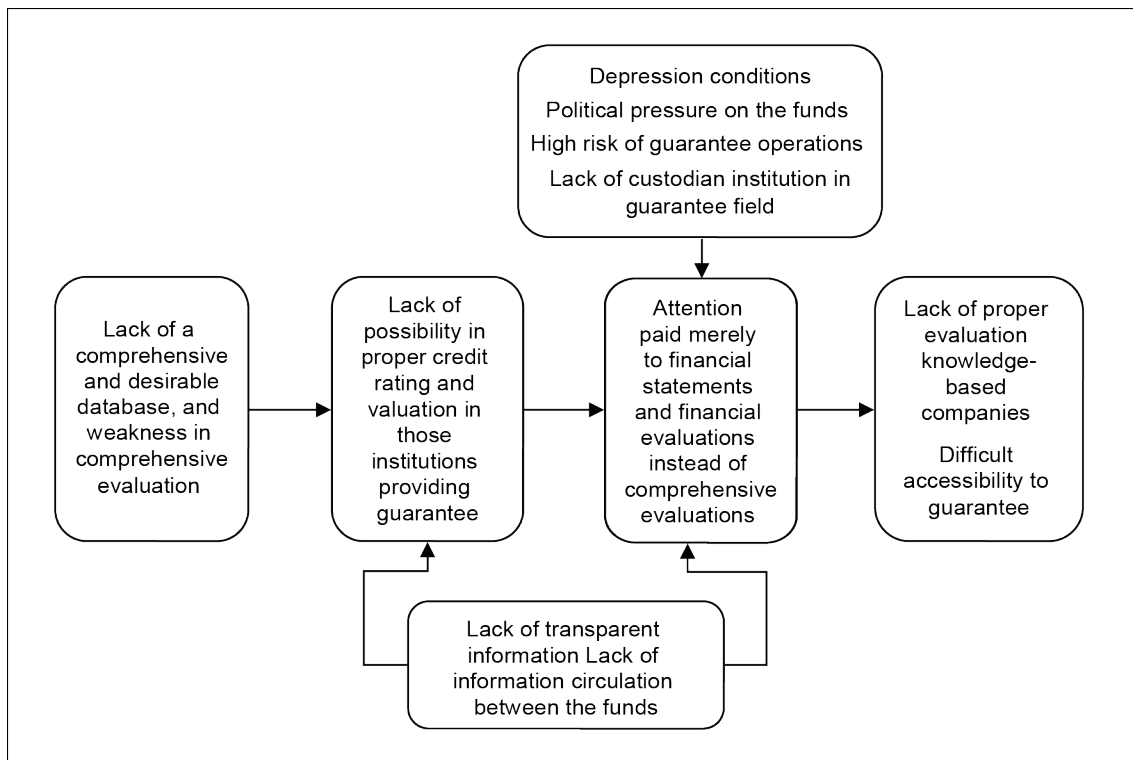
This analysis has been based on grounded theory⁶ and a model must be developed accordingly, based on the guarantee conditions in Iran. To do so, a paradigm model presented by Corbin and Strauss (2014) has been used after axial coding for theoretical description and selective coding. To extract the model, the concepts related to the modes have to be specified as the following (Corbin and Strauss 2014):

- **Causal condition:** Those conditions effective on axial category. These conditions are necessary; however, they are insufficient for achieving outcomes from applying the strategy. Considering the results from interviews with experts in the field, causal condition means the lack of a comprehensive and desirable database, and weakness existing in comprehensive evaluation.
- **Main category:** Existing shortcomings in providing guarantee services to knowledge-based companies including the “lack of possibility of proper credit rating and valuation in those institutions providing guarantee services.”
- **Intervening conditions:** According to interviews, they may be classified into two sections. First, a lack of transparent information as an obstacle to creating a database. This way, enterprises do not release much of their information. Also, a lack of information circulation between the funds has prevented even this little amount of information being pooled in a database. The second is the low level of non-governmental funds’ capital, which prevents them from issuing sufficient numbers of guarantees upon expertise evaluation.
- **Contexts:** This refers to environmental factors affecting the whole system. The guarantee procedure is directly affected by the economic condition, which will increase the level of default under economic depression or political pressure, and increases the operation risk. The lack of a custodian institution in the field of guarantees leads to no supervision of activities performed by these institutions. The lack of supervision of the system causes a reduction of trust by stakeholders.
- **Strategies:** The lack of technical evaluation and a strong database has led to attention being paid merely to financial statements and financial evaluation. This prevents the capabilities and assets of knowledge-based companies from being properly evaluated. On the other hand, the low level of capital in nongovernmental funds has led to a reduction in their capacity to issue guarantees and the lack of a custodian institution in the field has reduced acceptance to the stakeholders.
- **Outcomes:** The system outcome is the current guarantee condition, distanced from the desirable level. Having access to guarantees will become hard and costly.

Figure 14 is a schematic of the model:

⁶ Further details on the methodology and discussion of the grounded theory are given in Appendix 1.

Figure 14: Extracted Model Based on Grounded Theory



Source: Authors' compilation.

7. CONCLUSION AND POLICY RECOMMENDATIONS

The importance of SMEs, especially knowledge-based companies, in the Iranian economy has been explained in this chapter. In addition, an overview of the financing scheme in the Iranian economy showed that facilitating the accessibility of enterprises to bank resources is an important step to be taken in bridging the financial gap existing for financing these enterprises. One of the most important policies in this respect is the development of the credit guarantee scheme. The results have shown that credit guarantee has been formed in the country; however, major challenges make access to guarantees difficult for SMEs. A review of the existing condition in Iran and its pathology indicated some policy measures required to be taken for the development of a credit guarantee scheme. Some of these measures are fundamental and some strategic. Fundamental measures include such cases as the establishment of a custodian institution for guarantee funds, the establishment of a comprehensive database for enterprises (such as the CRD in Japan), and the expansion of nonfinancial evaluations. Strategic measures include such cases as increasing interaction with banks, using risk-sharing mechanisms, and more interaction with existing funds. All the aforementioned measures will be discussed in detail.

7.1 Fundamental Measures to Improve the Credit Guarantee Status of SMEs

By fundamental measures, we mean those measures requiring macro decision-making by the parliament and the Cabinet, while their success necessitates the cooperation of institutions and governing organizations at the highest levels. For example, currently establishing a new governmental institution in Iran is very difficult, with numerous laws impeding the procedure. Removing these impediments requires the cooperation of parliament, the government, the Guardian Council of the Constitution, and the Expediency Discernment Council, among others. So some required measures for the development of a credit guarantee scheme in Iran must be decided upon in this way. The fundamental measures for developing a credit guarantee scheme in Iran will be explained.

7.1.1 Establishment of a Backup Institution (Custodian) in the guarantee Field

One of the issues discussed in the interviews with experts was the lack of a custodian institution in the field of credit guarantee. Of course, the point is also clear from studying those institutions existing in the field whose regulatory and institutional framework is very important in developing a credit guarantee scheme (OECD 2017). Currently, non-governmental research and technology funds operate under the supervision of a workgroup in accordance with Article 44 of the law on removing obstacles of competitive production and promoting a financial system of the country approved in 2015 (1394). Governmental guarantee funds also work according to their statute approved by the Cabinet. These types of supervision conditions may be compared through the supervision pattern imposed by the Central Bank of Iran on other banks and credit institutions. In this desirable situation, the Central Bank is continuously supervising and regulating banks and other depository financial institutions, central insurance supervises the insurance companies and securities, and the exchange organization of Iran does the same for the capital market and issues directives and regulations, in line with requirements. However, such a dynamic is not seen in supervision carried out by the workgroup and the Cabinet for the guarantee funds. The existence of such a mother organization will create a uniform procedure in regulating routines; on the other hand, it will increase the credibility and creditworthiness of the guarantee institutions. L/Gs issued by some guarantee funds are not accepted by some private or governmental organizations because they believe that in the case of default, they have no compensatory action that can be taken. They consider a lawsuit to be a costly and time-consuming procedure, in regard to claiming their rights. A custodian institution may also support a guarantee fund; it may protect them under special circumstances through such mechanisms as risk taking, mostly. In some countries like Japan, the risk of credit guarantee corporations is taken by another government entity that provides the credit insurance, and acts as a reinsurer, or guarantor. This entity in the case of Japan is the Japan Finance Corporation (JFC), which provides insurance services to credit guarantee corporations, and guarantees the risk of the guarantor (Yoshino and Taghizadeh-Hesary 2016).

7.1.2 Lack of Comprehensive Evaluation Mechanism

Evaluating companies is considered a fundamental way of supporting them and providing service to them. If evaluations are accurate and lead to appropriate ranking of companies, the allocation of credit and financial support will be made more easily and more efficiently because the information asymmetry will be reduced. One of the problems occurring in the evaluation of companies by financial institutions is their focus on financial evaluation. What is important is the point that evaluation can provide good feedback of companies' ability to fulfill their financial, technical, and managerial obligations etc. So mere financial evaluation does not reflect companies' capabilities in terms of nonfinancial aspects. Comprehensive financial, technical, and managerial evaluations etc. are considered one of the needs in interacting with knowledge-based companies, in addition to maintaining market share. Ranking resulting from comprehensive evaluation is more dependable. It can be used for financial support and issuance of guarantees, according to resulting priorities.

Comprehensive evaluation is best due to the review carried out on major aspects of the company. To achieve comprehensive evaluation, experts in each field may be of help. Financial experts have always helped in ordinary evaluations. Even financial software packages can evaluate financial indices. However, to evaluate other aspects, such as managerial or technical capabilities, there must be expertise. This is provided by experts in industries, at universities, and/or in the fields under evaluation. Evaluations performed using their views are called "expert evaluations." For such a mechanism, the following points must be taken into consideration:

- I. Selecting accurate indices;
- II. Being centralized;
- III. Evaluating through a network to minimize cost;
- IV. Using a very precise evaluation system;
- V. Using standards in the evaluation process;
- VI. Independence of the evaluator institution.

Another requirement for nonfinancial and comprehensive evaluations is the existence of high-quality and rich databases. In Iran, there is room for such a database to be created as one of the most fundamental measures in improving guarantee status and removing information asymmetry. This could be done by taking advantage of successful international samples as models. One of the most successful examples of such a database is the Credit Risk Database (CRD) for SMEs in Japan, which may be considered a good model for Iran (see Kuwahara et al. 2016 for more information on the CRD).

7.2 Strategic Measures to Improve Guarantee Status in Iran

These kinds of measures are feasible through existing institutional facilities, unlike previous ones. They have a significant effect on the development of credit guarantees in Iran. In brief, they can be listed as below:

7.2.1 Risk-sharing Mechanisms Applied by Supportive Institutions

The low level of capital is one of the problems confronting non-governmental research and technology funds. This causes two problems. Firstly, their volume of guarantees will become limited, and in turn, they may not be able to take high risks. An inappropriate solution would be the injection of resources into these funds by the government or shareholders, which is simple but accompanied by a moral hazard, i.e. related funds may reduce the accuracy of their evaluations. This will result in the level of dishonored guarantees becoming high.

Another solution is a risk-sharing mechanism that increases the strength of funds in the issuance of guarantees. On the other hand, this prevents the funds from reducing the accuracy of their evaluations, because dishonoring guarantees results in their own losses too. A model of such a method is used by the government in Japan, i.e. supporting issued guarantees through the Japan Finance Corporation (JFC) as a public corporation wholly owned by the Japanese government (see <https://www.jfc.go.jp/n/english> for more information on credit insurance programs). The procedure adopted by the corporation concerns the payment of default guarantee funds, after their assurance of no problem existing in evaluating the related fund.

7.2.2 Guarantee Funds Networking

Based on the player situation in the CGS in Iran the funds have no interaction and cooperation with each other. For example, they can share their information regarding noncreditworthy clients to prevent others from dealing with them. Cooperation in terms of funds may begin before the formation of a custodian institution.

The first step would be to knowledge the transfer of experiments in the evaluation field and cooperation in assessing applications and sharing risk assessment methodology. The next step would be making the effort to create a coordinated mechanism, cooperating in terms of issuing joint guarantees, etc., which demands higher levels of cooperation. This may pave the way for establishing a successful custodian institution.

For example, small funds can be representative of large funds; that is, nongovernmental research and technology funds with lower capital than governmental ones may issue guarantees, in cooperation with governmental guarantee funds. In this respect, a “small industries guarantee fund” has been prepared to issue guarantees based on evaluations made by nongovernmental research and technology funds including the one directed by the University of Tehran Science and Technology Park.

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APPENDIX

Methodology

Analysis of the current status in Iran has been performed based on grounded theory. In fact, grounded theory is a method of recognizing the subject under study and subject(s) not comprehensively studied before, of which we have limited knowledge (Creswell 2014).

However, the following phases are agreed upon by those who suggest them, and also people researching the method (Glaser and Strauss 1967):

- I. **Data collection** (theoretical sampling)
- II. **Coding** (content analysis): Any content in the research based on grounded theory has to have a unique marker so that it can be recognized through it. In this way, reference can be made to it simply during the next phases. These markers are used in the conceptualization and categorization so that they will be documented within each of the concepts and categories. To avoid the repetition of content and prolongation of tables, a marker (code) is used, instead of writing the content.
- III. **Conceptualization**: This is a mental and creative process that takes place with the aim of grabbing conceptual commonalities from among numerous objectivities.
- IV. **Categorization**: Here, relationships between concepts are explored and stated.
- V. **Modeling**: In grounded theory, modeling includes several general topics. They include causal conditions, the main categories, intervening conditions, contexts, strategies, and outcomes.

The report data were collected in December 2016. Interviews were organized according to theoretical literature and a review of international experience, especially that related to the developed countries (Yoshini and Taghizadeh-Hesary 2015, 2017; Aboojafari et al. 2017). Accordingly, a credit guarantee scheme and the main elements of operations performed by its components were extracted, specifically those related to guarantee institutions. To study the status of the world and for pathology purposes, semi-structured interviews were used to collect qualitative data. Interviews were started with questions related to: i) the operation of the company, ii) the method of initial financing, iii) requirements related to the field of guarantee, and iv) challenges related thereto (open interviews). The remaining parts of questions were based on responses made by the interviewees. All interviews were recorded and reviewed several times, with the aim of extracting key points. Taking into consideration the priorities set by the research, interviews with two groups were organized. The first group included those individuals with proper experience of knowledge-based companies in terms of problems and challenges. These companies were selected from different sector and their managers having good analysis of business environment. The second group consisted of those funds with effective activities in the field of issuing guarantees. All phases considered in the grounded theory-based method were followed in order for the paper to be written.

From among the interviews, 268 codes were extracted with the inclusion of repeated similar propositions. After coding, repetitive propositions were selected. From among them, the need for technical evaluation with the highest number of repetitions (15) was emphasized. Important and repetitive propositions in terms of theoretical literature (Yoshini and Taghizadeh-Hesary 2015, 2017; Aboojafari et al. 2017) are presented in the following table, after providing brief information about the interviewees:

Table 10: Sample Size of Interviewees

Research-related Section	Number of Interviewees
Knowledge-based companies manager	13
Guarantee funds manager	8

Source: Authors' compilation.

Table 11: Categories Extracted from Interviews

Category	Concepts	Codes
Financing and insurance	High interest rate is a problem for knowledge-based companies	A.8.10, A.10.10
	Long serving time of receiving financial services and low credit limit	A.4.6, A.5.3, A.8.2
	Lack of financing in semi-industrial phases	A.2.6, A.10.14, A.12.3
	Lack of insurance record of new products	A.8.7, A.1.3
	International insurance requirement	A.10.11
	Lack of reinsurance as a possible choice	B.1.18, A.1.16, B.2.9, B.4.8
	Lack of comprehensive credit insurance scheme in the country	A.13.14
Guarantee	Existence of institutions over the need, and lack of custodian institutions	A.3.5, B.1.15, B.1.17, B.2.7, B.4.13, B.4.10, B.1.14
	High risk of guarantee activities in the country	B.8.2, B.6.8
	Obstacle for providing guarantees	A.12.6, A.9.1, A.1.15, A.10.10, A.8.3
	Discriminatory conditions of accessibility to guarantee	A.13.7
	Contractual guarantees	A.1.15, A.5.1, A.5.2, A.5.9, A.9.2, A.13.1, A.13.2, A.13.6
	Technological guarantee	A.1.9, A.1.10, A.1.11, A.1.12, A.1.13, A.4.10, A.8.8, A.9.5, A.13.12, B.1.18, B.1.19, B.3.19
Credit rating	Lack of comprehensive evaluations	A.7.5, A.8.5, A.8.6, A.8.10
	Expert evaluation	A. 3.14, A.1.6, A.1.7, A.2.8, A.2.11, A.2.10, A.2.12, A.4.4, A.5.5, A.13.16, B.2.3, B.2.12, B.3.5
	Governmental credit rating is not efficient	A.2.9
	Just academic evaluation is not enough	A.9.7, A.13.33, A.4.6, A.5.5, A.7.4, A.13.33
	Third-party evaluation needs a very strong, credible institution with low level of bureaucracy	B.1.12, B.1.13, B.1.14

Note: In codes, **A** refers to the first group that interviewed with them and **B** refers to second group.

The first number refers to the number of interviewed persons in each group and the second refers to the number of propositions made by the interviewer.

Some of these propositions are related to current weakness, and some others present solutions for exiting from the existing situation. After summing up the views regarding the pathology of the current situation in Iran, a framework was achieved.