

# The Impact of Information Asymmetry on the Bank Financing of SMEs in Algeria: An Econometric Study

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**Abstract** Improving the access of small and medium-sized enterprises to funding sources is an interest shared by governments, central banks and supervisory ministries ... this interest explains in an important aspect the problem of asymmetric information which is become more and more interesting, especially after the development of the information economy and economies of uncertainty since the early eighties. Banks consider that the lack of information production and the weak financial structure of small and medium enterprises are key factors in the mistiness of their relationship, which explains why banks are hard to deal with this type of institution. The theory of microeconomics addresses the problem that is at the heart of the modernization of microfinance theory. We will try to identify the most important implications for the financing decisions of banks under asymmetric information, and then drop those concepts on the case of Algeria by addressing the following axes:

- The problem of asymmetric information in economic theory
- The impact of asymmetric information on the financing decisions of banks towards small and medium enterprises
- The impact of asymmetric information on the banking finance of small and medium enterprises in Algeria.

**Keywords** Small and Medium-Sized Enterprises, Information Economy, Asymmetric Information, Bank Financing, Algeria

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## 1. Introduction

The importance of small and medium enterprises for economic and social development has been dictated by the transformations and economic developments resulting from the phenomenon of globalization and economic blocs, which led investors and businessmen to reconsider their interventions, especially in the field of investment, where they favor the trend towards the small and medium enterprises Which are characterized by the ability to adapt quickly with economic changes, rather than the huge economic structures that have often been disrupted by the economic crises in the world.

Locally, the economic choices of the past have encouraged the achievement of big economic groups. Thus, small and medium enterprises in Algeria do not have a tradition of value, which requires giving it a chance in the process of restructuring the national economic structure, especially as it is better aligned with the demands of market economy.

Accordingly, we will proceed from the following question: What is the impact of asymmetric information on the banking finance of small and medium enterprises in Algeria Where the study focuses on the period after the year 2001 as a time frame for the study, especially after the issuance of the Guideline law for Small and Medium Enterprises.

## 2. Literature Review

### 2.1. The Problem of Asymmetric Information in Economic Theory

The general equilibrium theory assumes that all goods are homogeneous and that prices are determined according to supply and demand, but this analysis is not always the case. Sometimes the quality of a commodity is not known to one of the parties [1]. GEORGE AKERLOF contributed through his founding article In the clarification of the impact of Quality on price by the famous example about the used car market [2]. AKERLOF assumes that there are 100 sellers and 100 buyers in a used car market. To simplify, 50 cars are supposed to be in good condition and 50 are in bad condition. Only sellers know the quality of their cars. Bad car owners are asking for a price of \$ 1,000 to \$ 1,200, while good car owners are asking for a price of \$ 2,000 to \$ 2,400. If it is possible to distinguish between the qualities of cars by observation, it is not a problem, and the owners of bad cars

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will sell their cars at prices ranging between 1000 and 1200 dollars, and the owners of good cars sell their cars at prices between 2000 and 2400 dollars. But what if the quality of cars cannot be distinguished?

In this case, buyers will predict the value of each car, and as long as the probability of get a good car is equal to the probability of get a bad car, buyers are willing to pay the price:  $2/1 \times 1200 + 2/1 \times 2400 = 1800$ .

According to this price, good car owners will refuse to sell their cars and will go out of the market and buyers will get bad cars with prices higher than the real prices.

The distortion that led to this situation is what can be called the problem of asymmetric information, where one party has all the information about the transaction at the expense of the other party, without cost, leading to economic decisions are not sound.

This problem is particularly prominent in the field of insurance economics (the contract between securer and secured), financial markets (through nominal value and real value of securities), banking economics (the relationship between lender and borrower).

Two major problems can be results from the situation of information asymmetry:

#### 2.1.1. Adverse Selection

According to Akerlof's conclusion on the used car market, bad goods eliminate good goods because of the high cost of owning the information [3]. If we drop the example on the reality of bank financing for small and medium enterprises, this phenomenon arises as a result of the bank's offer the same rate of interest for Projects with varying degrees of risk [4]. Institutions that are in a difficult position are more willing to accept loans no matter how high the interest rate is, while good institutions respond negatively to accept loans with increasing of interest rates, which leads to the following result:

"Because of the problem of information asymmetry, the most insistent SMEs in obtaining loans are most likely to produce unsatisfactory results for lenders (because of high risk), while at the same time they are more likely to get loans."

We note that adverse selection is located from a time perspective before contracting [5].

#### 2.1.2. Moral Hazard

Unlike the adverse selection problem that can occur prior to a transaction, the problem of moral hazard appears only after the contract, so that the borrower uses the finance obtained in unproductive or high risk activities, which increases the likelihood of default. This is Usually associated to the problem of agency [6], especially in the financial markets through the inability of managers of companies as agents of shareholders to maximize the wealth of these individuals, and bondholders also may be exposed to this type of problems, which raises the problem of how to guide the behavior of these agents in the direction of achieving the

objectives of securities Campaign [7]. The reason for a lender's or investor's exposure to risk of moral hazard remains the inability to consistently monitor the activities of the borrower or issuer, as this process requires the costs of time and effort that he cannot afford and even with the lender's insistence that the borrowing contract Limits the borrower's ability to undertake high risk activities, but is still exposed to these risks if he does not consistently monitor the activities of the borrower to determine compliance with the terms of the contract.

The problem of moral hazard can be summed up as a problem with the behavior of the borrower, which the lender cannot predict [8], and it is more likely present in financing of small and medium-sized enterprises compared to financing big enterprises because of their lack of financial transparency, ownership structure and their owners' concealment of the real purpose of the project [9].

## 2.2. Impact of Asymmetric Information on the Banks Financing Decisions towards SMEs

### 2.2.1. The Relation Bank/SME

Although there is a very strong correlation between banks and small and medium enterprises, which is considered as first source of her financing, the nature of the relationship between them Characterized by conflicting interests because of the divergence of objectives and interests of both parties [10]. some economists [Mayer, Porter] see that the long-term relationships between banks and small and medium enterprises is a positive indicator of economic growth and prosperity - and support their views on both the German and Japanese economies - others in particular [Hellwig] see that this relation is a source of many problems, Banks are forced to bear bad customers for too long, and this is in the interest of small and medium enterprises, whose behavior becomes opportunistic and exploitative, which leads to inefficient allocation of loans at the macroeconomic level, and this is detrimental on the level of economic growth [11]. The analysis of the status of bank loans for small and medium enterprises is not a microeconomic concern, but rather an examination of ways of promoting and improving the relations between small and medium enterprises in order to promote economic growth.

### 2.2.2. Impact of Asymmetric Information on the Efficiency of the SME Loan Market

The theory of market efficiency, according to its founder Fama (1965), is based on the premise that "prices find their effect directly on the market and reflect all available information [12]." The efficient market can be defined as a market where all pertinent information is available to all participants at the same time, and where prices respond immediately to available information, and this assumes that all market participants can access information whether it is current or past information. Stock markets are considered the best examples of efficient markets.

Grossman and Stiglitz (1980) argue that even in highly efficient markets, the expectation of the evolution of financial asset prices and transactions is not possible because competency requires multiple conditions (free circulation of information, useful information and no costs, Rationalizing

the behavior of investors, ...) [13], which confirms the ongoing debate about the relative efficiency of markets. However, it is difficult to achieve all the efficiency requirements combined in the SME loan market [14].

**Table (1).** The most important conditions of efficiency that cannot be achieved in SME loan markets

Conditions of efficiency	Elements that cannot be achieved in SME loan markets
<p><b>The free circulation of information:</b> The information must be available to all economic agents and analyze and benefit from them in real time (Philippe Gillet 1999)</p>	<p>In the SME loan markets, banks have some kind of monopoly power over their former customers (the bank has additional information about these customers compared to other banks, which leaves it inefficient to rent money. Sharpe (1990)</p>
<p><b>Provide of useful information at no cost:</b> All economic operators must have access to useful information, without costing them additional costs. (Philippe Gillet 1999)</p>	<p>An important part of the difference in interest rates charged to institutions explains by the cost of obtaining information when it comes to small and medium enterprises. (Christian Picory 1995)</p>
<p><b>Absence of transaction costs:</b> There are no costs or fees that may restrain or eliminate potential profits. (Philippe Gillet 1999)</p>	<p>Banks have the ability to not change their lending terms if the expected benefits under ideal conditions outweigh the adjustment costs (informing clients of policy changes, ...). (Kosekela1976)</p>

### 2.3. Financing Decisions in Case of Asymmetric Information

Decision making process is important in economic analysis, any economic action resulting from a decision or set of decisions taken under certain conditions and with regard to the financing decisions taken by banks under conditions dominated by the problem of information asymmetry, it can be summarized in figure (1).

It is clear that the lack of information in the SME loan market only leads to more banks' problems in knowing the quality of borrowers. Many studies of bank financing for small and medium enterprises indicate that the overall trend of bank behavior in case of information asymmetry is either rationing Loans or grant them at an additional cost, economic literature on this subject is based on two main approaches to overcoming the problem of asymmetric information, Stiglitz et Weiss (1981).

- Rationing Loans: Banks tighten the supply of loan contracts and make them more complex. Townsend (1979)
- Increasing the supervision of the institution and loans and monitoring the results: This will increase the costs of the bank, but in turn, this reduces the risk.

## 3. Problem Modelling

### 3.1. Impact of Asymmetric Information on the SMEs Banking Finance in Algeria

After presenting the problem of asymmetric information and related problems that impede the financing possibilities of small and medium enterprises through the two previous axes, we will attempt to drop these concepts on the reality of

SME financing by studying the loans granted by the local development bank and Its relationship to some explanatory variables, and we try to determine the extent to which the implications of this problem contribute to influencing the bank's financing decisions.

### 3.2. Database and Model

The database on the institutions covered by the study is based on a set of accounting information and some information related to the granting of loans at the level of the local development bank. Based mainly on the work of Catherine Refait (2002), Cieplysylvie (2002).

We try to write the estimation of a regression equation for loans granted by the local development bank Based on explanatory variables that theoretically assume that they reflect this problem.

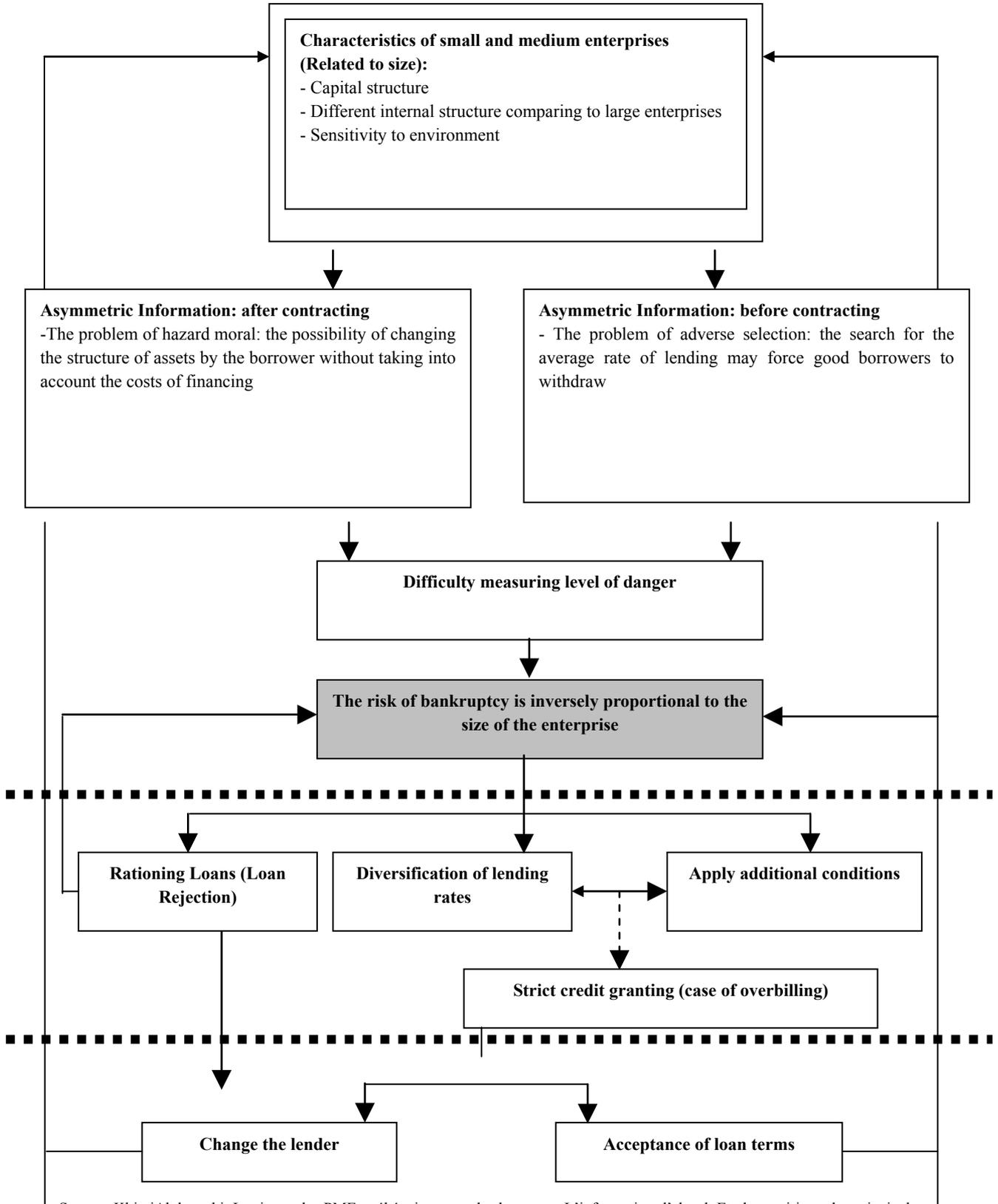
### 3.3. Variables Identified

It is very difficult to obtain the variables related to the problem of asymmetric information in the field of information economics, and it presents several problems when trying to model them, but often resort to some of the approximate variables that reduce these difficulties, and in this regard can be organized These variables are in three main groups:

These variables can be modelled using the linear regression method using EViews as follows:

$$Y = \alpha_0 + \alpha_1 NAV + \alpha_2 LC + \alpha_3 NS + \alpha_4 SIZ + \alpha_5 AG + \alpha_6 EAR + \alpha_7 EAS + \alpha_8 AIR$$

With  $y$  the amount of credit granted to the company,  $\varepsilon$  is an error term of zero mean and constant variance; model parameters measure the variables sensitivity to Grant of credit.



Source: KhiariAbdennabi, Le risque des PME québécoises pour les banques : L'information d'abord, Etude empirique des principales causes des taux d'intérêt bancaires relativement élevés, Institut de recherche et d'enseignement pour les coopératives de l'université de Sherbrooke (IRECUS), Juillet 2002, p 42.

Figure (1). Risk Assessment Model for Small and Medium Enterprises

**Table (2).** Explanatory variables used in the model

Variable used	reflected explanatory factor	Phenomenon described
Variables under the symmetric information		
Net asset value (NAV) = $\frac{\text{Productive equipment + stock}}{\text{Total assets}}$	Net asset value	trigger bankruptcy
Liquidity crisis (LC) = $\frac{\text{gross operating surplus - financial expense}}{\text{turnover}}$	Liquidity	Support cost
Net situation (NS) = $\frac{\text{Total assets}}{\text{Total indebtedness}}$	Net situation	Potentialities of recovery
Variables under the asymmetric information: Variables that will mitigate the problem of asymmetry of information		
Size (SIZ): Turnover	Size	Existence of asymmetric information
Age (AG): Number of years	Lifetime	Existence of asymmetric information
Variables under asymmetric information: variables that Reinforce the problem of asymmetric information		
Enlarged accumulation rate (EAR) = $\frac{\text{Total investment} + \Delta \text{NWC}}{\text{Capital committed}}$	Past investment	Opportunities for growth
Ease of asset substitution (EAS) = $\frac{\text{Productive equipment}}{\text{Capital committed}}$	Rigidity of the productive structure	Asset substitution risk
Apparent interest rate (AIR) = $\frac{\text{Interest charge}}{\text{Company's credit amount}}$	Debit interest rate	Asset substitution risk

In order to obtain statistically significant results, it is first necessary to diagnose the proposed model estimation problems, which relate to the possibility of dropping one of the classical assumptions of the multiple regression model.

After the discovery of multicollinearity, and after a compromise between the number of models were dropped two variables (NAV and EAR) because they are more closely associated with the EAS variable (0.61606, 0.84262, respectively), and because this method is considered the best to overcome (the mask effect) which causes this problem, with regard to the heteroskedasticity problem when the nature of heteroskedasticity it isn't known Eviews suggests the white estimator, which allows to give an unbiased covariance to the estimated parameters - which overcomes

this problem - this estimate is defined as following:

$$\hat{\Sigma}_w = \frac{T}{T-k} (x'x)^{-1} \left( \sum_{i=1}^T u_i^2 x_i x_i' \right) (x'x)^{-1}$$

However, we will use another estimate, (the Newey-west estimate) because this estimate also gives unbiased covariance of estimated parameters in the presence of heteroskedasticity and autocorrelation problems, as in the model, as follows:

$$\hat{\Sigma}_{Nw} = \frac{T}{T-k} (x'x)^{-1} \hat{\Omega} (x'x)^{-1}$$

And therefore, the model after correction becomes:

$$Y = \alpha_0 + \alpha_1 LC + \alpha_2 NS + \alpha_3 SIZ + \alpha_4 AG + \alpha_5 EAS + \alpha_6 AIR$$

## 4. Results

After modifying the studied model, the following results were obtained:

	Coefficient	Std. Error	t-Statistic	Prob
(Intercept)	3.564610	38.31508	0.093034	0.9267
LC	-0.522561	0.733678	-0.712248	0.4835
NS	-9.143346	3.604106	-2.536925	0.0184
SIZ	1.046033	0.345767	3.025254	0.0060
AG	0.532068	0.428418	1.241938	0.2268
EAS	0.975696	0.294572	3.312248	0.0030
AIR	14.21348	250.1978	0.056809	0.9552

A t-test was used to examine the influence of every independent variable in the model of Grant of credit. After testing the hypotheses by comparing the student statistics of the estimated parameters to the table student value, the results show significant of NS, SIZ, EAR at 5%. It can be seen that the coefficients of these variables are significantly different from 0 as indicated by Student calculated ratios, that are higher than the theoretical value of the Student table, the values P-value that is less than 5%, while LC, AG, and AIR variables are not significant in the interpretation of the loan granting process.

R-squared	Adjusted R-squared	F-statistic	Prob(F-statistic)
0.769815	0.709766	12.81991	0.000002

F-test was used to determine significance of the model. The results of F-test on 5% importance level was  $F\text{-estimate} > F\text{-Table}$  ( $12.81 > 2.53$ ). So the model was meaningful at 5% importance level. The results indicated that it was adequate to explain the effects of independent variables on dependent variable.

Multiple determination coefficient of the model (R-square) is 0.76, adjusted multiple determination coefficient is 0.70 and this shows that the variables in the model explain 70% of the grant of loans variable. The remaining 30 % is about the influence of unregistered or not considered factors.

## 5. Discussion

The obtained results show that LC, AG, and AIR variables do not statistically affect the decision to grant the loan, which can be explained as follows:

- the variable LC:

It appears that the bank does not care about this problem when granting the loan, and this may be due to its study of the possibilities of improvement in order to find out if this

problem is temporary or structural, and also because most of the small and medium enterprises that apply for loans suffer from this problem (It should be remembered that this variable is obtained under the symmetric information).

- the variable AG:

Can be interpreted as insignificant in the decision of lending due to the government policy that encourage the establishment of small and medium enterprises as the ministry of sector aspires to reach 1000000 institutions, in addition to the agreements with some financial institutions and banks to facilitate the financing of this type of institutions, which can explain the lack of statistical significance of this variable at the model level.

- the variable AIR:

With regard to this variable, the absence of financing alternatives for small and medium enterprises - which may offer lower interest rates or other alternative financing formulas - obliged them to be directly linked to bank financing. Therefore, the bank is not interested about the costs of interest to be paid by Small and medium enterprises (which would create a problem of hazard moral in the form of asset change).

While the variables explaining the phenomenon of granting loans at the level of the bank are:

- the variable NS:

The results show that the variable NS is negatively related to the decision to grant the loan. This means that whenever there is a negative liquidity position within the institution, there is a reservation in granting loans.

- the variable SIZ:

There is a positive influence between the size of the institution and the loan granting process, as the volume of loans increases with the size of the institution; in other words, larger institutions are more likely to obtain loans (this problem is not posed between big enterprises and SME, but list even within small and medium enterprises themselves).

- the variable EAS:

Whenever the structure of production is rigid, whenever confidence that assets cannot be easily changed and thus more likely to obtain loans.

## 6. Conclusions

The results of the econometric study based on the accounting data of the surveyed sample institutions lead us to the fact that the financing of small and medium enterprises at the level of the local development bank is characterized by:

- The theoretical results are consistent with the results obtained with regard to the net situation (NS), the size of institution (SIZ) and the ease of asset substitution (EAS) by the bank when making the financing decision.
- The bank neglects the considerations of the liquidity problem LC, the age of the corporation AG and

apparent interest rate AIR when making the decision to finance, which is contrary to the theoretical assumptions, as the bank's funding for newly established institutions make the information around them very limited, which opens a wide area of the problem of asymmetric information, The failure to take into account the high costs of interest may also lead the borrower to change the asset structure, especially in the absence of alternative sources of financing (limited to traditional financing, associated with traditional guarantees).

Thus, we conclude that the financing of small and medium enterprises - in light of the results reached - is characterized by conditions dominated by the problem of asymmetry of information, which confirms the financing problems suffered by the sector of small and medium enterprises in Algeria, In light of this difficult reality, It is very important to adjust the behavior of both banks and small and medium enterprises in order to improve the conditions of access to information, thereby enhancing confidence in their financing relationships.

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