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Factors Influencing Credit Decisions for Lending to SMEs in Algerian Banking Practices: Principal Components and Theoretical Insights

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Abstract:
This study explores the application of information asymmetry theory within the economic domain, examining its relevance and implications for credit demand among SMEs in the Algerian banking sector. By reviewing literature on information asymmetry and related theories, We focus on key concepts such as adverse selection, signaling, collateral, and screening. Our analysis identifies three principal among thirteen major components influencing credit decisions for lending SMEs. These components together explain a substantial part of the variance in credit practices, offering insights into the critical factors that influence credit decision-making. Our findings highlight the importance of guarantee demands, project profitability assessments, and applicant preparedness in shaping credit policies, thereby providing a clearer understanding of the dynamics governing credit provision to SMEs in Algeria. This research aims to inform future financial strategies and policy-making in the banking sector.

Keywords:
Information Asymmetry, Credit Demand, SMEs, Algerian Banking Sector, Principal Component Analysis.
JEL Codes: G21, G32, D82.

Introduction:

Numerous countries globally have adopted strategies to establish and expand small and medium-sized enterprises (SMEs) to stimulate economic growth, create jobs, and boost income generation, which has resulted in the worldwide proliferation of micro, small, and medium enterprises (MSMEs). The scarcity of published data on SME activities in certain countries has hindered comprehensive statistical analysis of their productivity or performance. Their agility and ability to adapt to changing market conditions make them essential drivers of economic resilience and dynamism. Several researchers have argued that the SMEs efficiency aspect is indispensible for achieving economic and social objectives. (Dewatripont & Maskin,

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1995), (Acs et al., 2008). However, despite their crucial role, SMEs face substantial barriers that hinder their ability to thrive and expand.

One of the most significant obstacles confronting SMEs is access to finance. Financial institutions often perceive SMEs as high-risk borrowers due to their limited operational histories, lack of collateral, and often insufficient financial documentation. These perceptions lead to higher costs of borrowing or outright rejection of loan applications, constraining the growth potential of these enterprises. This financial constraint is exacerbated by the phenomenon of asymmetric information, where banks and SMEs operate with unequal knowledge and information.

In the banking-SME relationship, asymmetric information manifests as banks having less insight into the true creditworthiness and business potential of SMEs compared to larger, more established firms; this information gap can lead to adverse selection, where banks are inept to differentiate amongst high-risk and low-risk borrowers, and moral hazard, where SMEs might engage in riskier behavior post-loan approval. These issues make banks more cautious and stringent in their lending criteria, further limiting SME access to necessary capital.

Addressing the challenges of financing SMEs is thus imperative for unlocking their full potential and ensuring they continue to contribute to economic development. This paper aims to explore the factors banks use to evaluate SMEs during the credit decision-making process. By identifying these factors, we can develop a framework to facilitate the lending process, thereby enhancing SME access to finance and enabling them to play their pivotal role in economic development.

Literature Review:

SMEs Definitions and Importance

Small and Medium Enterprises (SMEs) are widespread globally, representing over 90% of total enterprises in most regions. They have a crucial impact on economic progress by offering fresh job opportunities. opportunities and producing goods and services. Their growth and development are crucial, as improving the overall standard of living is hard to envision without their contribution. SMEs are essential to a country's economic development, particularly in terms of production, job creation, export contributions, and promoting equitable income distribution.

Despite their importance, there is no universally accepted definition of SMEs. For instance, the World Bank defines SMEs as firms with up to 300 employees, the UNDP sets the threshold at 200 employees, and the African Bank uses 50 employees. According to the European Commission. While the number of employees is the main determinant for categorization, net turnover and total balance sheet are also taken into account, although they may occasionally be deceptive, particularly for companies in sectors with high turnover.

Despite the critical link between SME dynamics and the overall economy, The obstacles arise from decreased global demand and constrained financial means, academic studies investigating post-crisis SME performance indicators are surprisingly limited, except for studies by Sannajust (2014) and Chowdhury (2011) ((Sannajust, 2014); (Chowdhury, 2011)). Their positive impact on the economy is

undeniable, continually emphasized by economic experts. SMEs, often more agile and innovative, can inject new dynamics into the economy, fostering sustainable and inclusive development. Therefore, encouraging and supporting SMEs has become a priority for many governments and international organizations, acknowledging their significance in building a robust and equitable economy ((Muller et al., 2014); (OCDE, 2014); (Chowdhury, 2011)).
In some emerging economies, the SME sector has shown remarkable performance, with growth rates surpassing overall economic growth. Conversely, in Turkey, although indicators for SME numbers and employment were positive post-crisis, the dominance of low-tech micro-enterprises in the business landscape remained unchanged, resulting in a declining share of SME value added.

Literature Review on SME Financing

Several authors in the literature studied the financing patterns of SMEs, Ayyagari et al. (2012), for instance, explore the institutional and economic factors that affect the SME financing patterns, focusing on. Their study reveals that bank loans are the primary external funding source, and the entry of foreign banks can boost lending. Challenges in labor productivity are attributed to limited financing access and poor management. Informal enterprises make up a substantial portion of economic activities in developing countries, with informal financing channels playing a crucial role. Clarke et al. (2005) also highlight the significant role of foreign banks in lending to businesses in some Latin American countries post-financial liberalization.
Different researchers observe that SME loan sources and terms in developing nations encompass a wide array of institutions, from large to small, private to public, and domestic to foreign. This diversity extends beyond "relational" loans, which rely on personalized interactions between credit agents and business owners.(Beck et al., 2005); (Beck et al., 2008). Small businesses in countries with weak regulatory institutions rely less on external financing. Beck et al. (2011) identify several key factors influencing SME bank financing: ownership types, the presence of foreign and national banks, different loan technologies, and organizational structures. Additionally, various cultural and institutional factors impact small business financing, including policies that favor large enterprises, limited private sector credit, underdeveloped information networks, restrictive interest rate contracts, and the reliance of some small producers on the informal credit market due to operating outside government regulation.
As financial systems develop, they enhance the accessibility and efficiency of external financing for enterprises and industries. This improved access to capital allows businesses to invest more in productive activities, innovate, and expand their operations. Consequently, enterprises and industries that benefit from external financing tend to experience faster growth, contributing to overall economic development.
Banks benefit from economies of scale and scope in information production, allowing them to efficiently gather and utilize client information across various services. (Petersen & Rajan, 1994).

Financial contracts are commonly incomplete, enabling banks and clients to strengthen their commitments through repeated transactions, which facilitates low-cost renegotiation of debt contracts. This aspect of information production underscores the inclination of banks towards relationship banking, as discussed by Lehmann and Neuberger (2001), Yoshitomi and Shirai (2001) offer valuable insights. (Lehmann & Neuberger, 2001) (Yoshitomi & Shirai, 2001)

Informational Problems in the Bank-SME Relationship:

The bank-SME relationship can be influenced by factors such as firm size and age. Berger and Udell (1995) and Cole (1998) studied firms with fewer than 500 employees and found differences in the duration of bank relationships based on firm size. Larger firms tend to form long-term relationships, while SMEs prefer short-term ones due to concerns about the leakage of private information with multiple banking partners. In long-term relationships, gradual information acquisition mitigates information asymmetry and reduces credit rationing, explaining why Japanese companies favor these relationships. SMEs, on the other hand, often establish close credit relationships to avoid liquidity constraints and information monopolies. (Berger & Udell, 1995); (Cole, 1998)

The bank relationship can be evaluated through variables like relationship duration, scope, bank control, and the number of lending banks. According to Sharpe (1990), large firms are willing to pay more to maintain stable relationships, whereas SMEs cannot afford additional costs, resulting in shorter relationships. Start-ups and micro-enterprises are seen as risky by banks, leading to financial exclusion or short-term financing to minimize default risk.(Sharpe, 1990)

Relational credit plays a crucial role in reducing information asymmetry between banks and businesses, especially when collateral is absent. Berger and Udell (1995) and Petersen and Rajan (1994) highlight the role of credit relationships in decreasing information asymmetry and improving credit access for SMEs. others discuss how collateral can mitigate adverse selection and moral hazard arising from information asymmetry. Beck et al. (2005) study financial constraints on SME growth, showing that information asymmetry and lack of external financing limit SME growth potential. Brown et al. (2009) find that information-sharing agreements improve SMEs' access to credit by reducing information asymmetry. (Beck et al., 2005), (Brown et al., 2009)

Institutional factors significantly influence information asymmetry and credit allocation. Cull and Xu (2005) examine how ownership structure and institutional development affect SME financing in China. Their findings suggest that these factors play a crucial role in credit availability for small businesses. Mian and Sufi (2009) link information asymmetry in mortgage lending to the subprime mortgage crisis. Dell'Ariccia et al. (2008) emphasize the exacerbating effects of information asymmetry on SMEs during banking crises. De Haas and Van Horen (2012) explore the international transmission of shocks through syndicated loan markets, highlighting the global impact of information asymmetry. ((Cull & Xu, 2005); (Mian & Sufi, 2009); (Dell'ariccia et al., 2008); (De Haas & Van Horen, 2012))

Jayaratne and Strahan (1996) provide evidence on how bank branch deregulation improves information dissemination and contributes to economic development. Degryse and Ongena (2005) highlight the importance of geographical proximity and relational credit in reducing information asymmetry for SMEs. ((Jayaratne & Strahan, 1996); (Degryse & Ongena, 2005);

However; the financial intermediaries aim to obtain information about the demander in order to overcome credit market imperfections and information asymmetry. The latter appears to be a major financing constraint. As a financial intermediary, banks ensure the link between economic agents with financing capacity and those in need of financing. They operate fund transfers from depositors to borrowers. Money and information processing are thus the main inputs of the banking institution. Consequently, banks and financial intermediaries, in general, are considered agents playing a key role in the financial system as information intermediaries (Crouzille et al., 2004).

The informational asymmetry of financial markets has mobilized a significant portion of banking literature, particularly the theory of financial intermediation, which has highlighted the informational superiority of banks over other intermediaries. This superiority is attributed to the peculiarity of the relationship between the bank and its clients, allowing it to have a source of private information. The bank seems to have some expertise in evaluating borrowers.

Excessive credit risk-taking in banking can be attributed to mishandling of information about the borrower's quality. Credit decision-making and risk management resulting from it require a diagnosis of the borrower's repayment capacity. Business leaders do not have the same interests as creditors (Jensen & Meckling, 1976) and have more information about the quality of their projects and their own intentions to repay loans granted. This informational asymmetry leads to adverse selection and moral hazard phenomena (Akerlof, 1970); (Stiglitz & Weiss, 1981).

The borrower may conceal important information about the risk of his project to obtain credit or benefit from more favorable credit conditions. The adverse selection phenomenon thus stems from the lender's inability to distinguish between good and bad borrowers. Once the loan is granted, the borrower may also adopt risky strategies that maximize income expectations at the expense of lenders. Moral hazard, between the borrower and the lender, arises from the lender's inability to monitor the borrower's intentions and assess their efforts after granting credit. This information would enable the bank to better estimate the risk of loan non-repayment. The bank demands collateral. It monitors the actions of borrowers and structures contracts to be able to demand repayment of loans granted.

In this context, and to guard against borrower opportunism and reduce information asymmetry, the bank chooses to impose separative credit contracts. It proposes contracts with different interest rates and levels of collateral. Moreover, by maintaining a close and lasting bank-enterprise or banking relationship, the bank can accumulate private and reliable information to overcome information asymmetry.

It is based on a more or less implicit assumption that banks are capable of developing specific procedures for acquiring information about borrowers (clients) that can give them an informational comparative advantage over other types of lenders. (Enonga, 2006, p. 2)

Agents do not possess the same level of information, creating a situation of information asymmetry. In the credit market, the lender is at a disadvantage compared to the borrower, The problem of credit risk assessment arises from this information asymmetry, making it difficult to evaluate borrowers accurately. Minimizing credit risk primarily depends on the bank's ability to effectively collect and process information about the borrower's characteristics at the selection stage and additional information to monitor the borrower's actions after credit is granted.

Banks possess extensive information about their clients due to legal or technical requirements, which is protected by banking secrecy. Banks will only disclose personal information to third parties under specific circumstances defined by law, such as a judicial subpoena. However, due to commercial necessity (global competition), banks must continuously gather more information about their clientele. Thus, the superiority of banking knowledge is justified by banks' ability to produce both objective and subjective private information about each borrower (individuals and businesses). The confidentiality and integrity services that banks must provide facilitate this revelation of private information; Disclosing such information encounters two major obstacles:

- When private information are made public can lead to its use by competitors. Confidentiality services are crucial.
- There is a risk that the financier might undertake the project themselves. Banks establish a reputation for integrity by committing not to exploit the information received from their clients for their own benefit (Duchesne et al., 2013).

In their quest for information, banks face the problem of information asymmetry, which creates two main issues: adverse selection and moral hazard.

Van Horen (2007) examines the securitization of small business loans and its impact on information asymmetry (IA) and credit availability, providing insights into credit risk transmission and SME credit allocation. Banerjee and Duflo (2005) offer a comprehensive overview of economic growth theory from a development perspective, discussing the role of IA in credit markets and its implications for economic growth and development. Bates, Kahle, and Stulz (2009) investigate the determinants of corporate cash reserves in the United States, including the influence of IA, shedding light on corporate financial behavior. (Van Horen, 2007); (Banerjee & Duflo, 2005); (Bates et al., 2009)

Gopalan, Nanda, and Seru (2007) explore the role of business group affiliation in reducing IA and facilitating financial support, providing insights into corporate finance dynamics.

Gormley and Matsa (2014) provide guidance on managing unobserved heterogeneity in empirical studies of credit markets, including those focusing on IA,

thereby enhancing the validity of empirical research. (Gopalan et al., 2007); (Gormley & Matsa, 2014). Laeven and Levine (2009) analyze the relationship between banking governance and regulation, considering the implications for IA in SME lending.(Laeven & Levine, 2009)

Hainz and Kleimeier (2012) investigate how political risk and information asymmetry affect financial constraints for SMEs in transition countries. Their study highlights that political uncertainty increases information asymmetry, leading to credit rationing and inefficient investments. Khwaja and Mian (2005) analyze the impact of political connections on credit access in emerging financial markets, demonstrating that political influence can distort credit allocation and economic rent distribution among SMEs, showing the intricate link between politics and information asymmetry in credit markets.(Hainz & Kleimeier, 2012); (Khwaja & Mian, 2005)

In another study, Khwaja and Mian (2008) explore the effects of bank liquidity shocks on credit availability and conditions for SMEs in emerging markets. They reveal how information asymmetry intensifies the impact of liquidity shocks on credit allocation and economic activity, offering insights into financial stability dynamics. Allen, Carletti, and Marquez (2011) examine the interplay between credit market competition, capital regulation, and information asymmetry in SME financing, emphasizing how regulatory policies influence bank risk-taking behavior and SME credit access.(Allen et al., 2011)

Cull and Xu (2003) study the role of bureaucratic discretion and information asymmetry in credit allocation to state-owned enterprises in China. They provide insights into how institutional factors influence credit allocation dynamics and access to financing for SMEs, particularly in state-directed economies. Brown et al. (2009) investigate the effect of information sharing among financial institutions on SME credit allocation in transition countries, demonstrating that information sharing reduces information asymmetry, thereby enhancing SME credit access and fostering financial development.

Allen and Gale (2000) explore financial contagion, focusing on how information asymmetry and credit market disruptions can spread through the financial system. Their study offers important insights into how shocks in one part of the financial system can impact credit availability for SMEs and overall economic stability. (Allen & Gale, 2000). Djankov et al. (2007) provide a comprehensive analysis of private credit markets in 129 countries, examining factors that influence credit availability and terms. Their research highlights global SME credit access dynamics, emphasizing the importance of information asymmetry, legal frameworks, and institutional quality.(Djankov et al., 2007)

The bank effectively addresses information asymmetry better than other external partners, performing key functions such as providing access to payment systems, transforming assets, managing information, and handling risks (Freixas & Rochet, 2008). It gathers private information on borrowers, which is not shared with the market, and specializes in information processing and risk management, signaling borrower quality through credit contracts.

Empirical research, however, questions the bank's role as an information producer, suggesting that its informational advantage is relative. James (1987) found that loan announcements increase market value, indicating banks have specific information. Lummer and McConnel (1989) argue that this advantage varies with the stage of the credit relationship, with positive market reactions seen primarily during loan renewals, supporting Fama's (1985) view of information accumulation over time.(Lummer & McConnell, 1989); (Fama, 1990).
While Aintablian and Roberts (2000) confirm the findings in the Canadian market.
The debate on the credibility of banking signals continues, with the event study methodology being criticized. While older studies support the bank's role in producing and signaling information, the reliability depends on factors such as the stage of the banking relationship and lender quality. Nonetheless, banks' informational superiority over other financial intermediaries remains undisputed, stemming from their ability to collect and process information and create specific credit contracts to manage finanicial problems (Diamond, 1984); (Boyd & Prescott, 1986)).. Banks also benefit from long-term relationships that provide private information at lower costs, making them effective delegated monitors for creditors. (Diamond, 1984)

Methodology:

The study employed an inductive strategy combined with a qualitative research approach, focusing on empirical research regarding banking activity, SME financing, and information asymmetry in Algeria. Data were gathered through an email and face to face questionnaires survey as well as interviews, developed after a comprehensive review of existing research, and analyzed using various statistical techniques to understand relationships between variables and draw meaningful conclusions.
The questionnaire focuses on the variables influencing Algerian banks' decisions when evaluating SME credit requests. Additionally, it evaluated measures taken by these institutions to mitigate the effects of information asymmetry.
The target population comprised credit decision makers involved in SME lending at major Algerian banks such as BEA, BNA, and BDL. the questionnaires were distributed to a diverse sample of bank personnel, including supervisors, and managers from the SME marketing and risk departments. These participants were located at the head office, branches, and centers. Data collection took place over a fourteen-month period from June 2022 to August 2023.
The methodological framework allowed for an in-depth analysis of information asymmetry phenomena, its impact on credit allocation, and the bank-SME relationship. This comprehensive approach aimed to capture an overview of banking practices in different Algerian banks, ensuring a broad representation and enabling a thorough examination of the factors influencing SME credit decisions.
The study also assesses the significance of personal contributions in SME financing, borrower repayment capacity, project profitability, the preparation of credit

applicants in building strong cases, credit request volume, and uniformity of credit processing procedures among banks.

It further investigates the average processing time for credit applications, the adequacy of required guarantees, and banks' familiarity with credit applicant entrepreneurs. Key aspects such as trust in the bank-SME relationship, the impact of the leader's gender on financing access, and collaboration among banks in the credit decision-making process are also analyzed.

Additionally, the study examines the influence of SMEs' current financial situation, business profitability, debt levels, and industry-specific conditions on credit allocation decisions. It measures variables related to borrower characteristics such as business reputation, credit history, references, and owner's personal traits to evaluate credibility, reliability, and repayment capacity during credit allocation.

Finally, the study explores the importance of economic conditions and industry-specific factors in assessing SME borrowers. Overall, it provides a comprehensive analysis of SME financing dynamics and information asymmetry within Algerian banks.

We utilize Principal Component Analysis (PCA) to reduce the dimensionality of our data and explore the complex relationships between variables. PCA serves as a powerful and versatile statistical method widely employed in empirical research to uncover the structure of multidimensional data. In our study on SME financing and information asymmetry, PCA plays a crucial role in simplifying our dataset while preserving essential information.

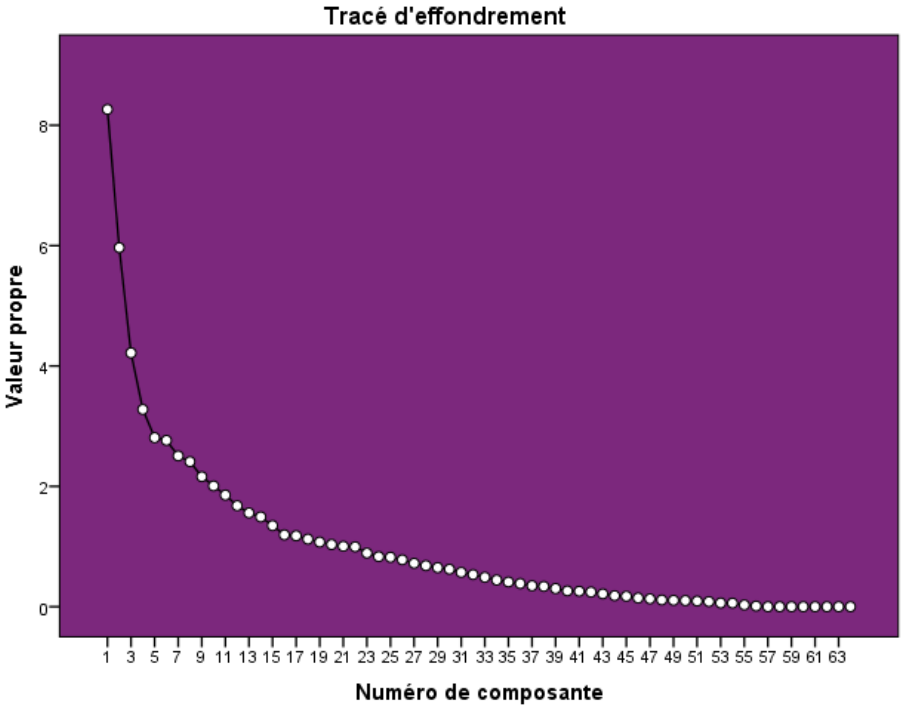
PCA helps us identify patterns, trends, and hidden relationships between the variables studied. Specifically, in the context of SME financing and information asymmetry, PCA assists in identifying key factors influencing funding availability and understanding the complex dynamics governing the relationships between different variables. By applying PCA to our dataset we identify the principal components that best explain the observed variation. We then explore the structure of factor loadings to interpret the relationships between our variables of interest. Finally, we use this information to enhance our understanding of SME financing and information asymmetry by identifying key factors influencing these crucial phenomena.

We note that we reduced the 13 components we have got in our first analysis into 3 main ones, in order to get a deepest view of our studied topic.

Results and Findings

The KMO measure evaluates the proportion of variance among our variables attributable to latent factors. Typically, a KMO index exceeding 0.5 is deemed adequate for Principal Component Analysis (PCA). Here, a KMO index of 0.887 indicates a reasonably high sampling adequacy, implying that our data is well-suited for PCA. Moreover, Bartlett's test of sphericity examines whether the correlation matrix between variables significantly deviates from an identity matrix, indicating independence among variables. A p-value (Sig.) below a significance threshold, often 0.05, suggests significant deviation from an identity matrix, validating the use of PCA. In this instance, the p-value is nearly zero (0.000), signifying statistical

significance. This indicates that variables are interrelated, supporting PCA's use to uncover the data structure.
The results indicate the data's suitability for Principal Component Analysis and validate PCA's use to explore the data structure.
The plot of the PCA analysis shows the collapse of each of the 21 components in our study.



In Component 1 of our Principal Component Analysis (PCA), we observe a strong association with repayment capacity and interbank collaboration, indicating their importance in banking decision-making. Repayment capacity shows a high positive correlation (0.883, 0.869, 0.838), suggesting its significance. Interbank collaboration also demonstrates a high positive correlation (0.838), indicating its relevance in decision-making processes. However, collateral provided by SMEs appears to have a positive but lower correlation (0.731), suggesting its comparatively lesser influence on lending decisions. Additionally, credit repayment capacity shows a positive correlation (0.720), although slightly less significant compared to other factors.
Component 2 reveals a strong association with the quality of bank-client relationship management and the importance of the credit applicant's banking history in banking decisions. Bank-client relationship management demonstrates a very high correlation (0.926), indicating its strong influence on decision-making processes. Similarly, the credit applicant's banking history shows a very high correlation (0.926), suggesting its significance in banking decisions. The relationship between the bank and the enterprise also plays a significant role, although slightly

less determinant in the variation explained by this component, with a high correlation of (0.833).

Component 3 highlights the insignificance of capital in SME credit allocation and emphasizes the importance of credit history and previous payment behavior. Capital is not a significant factor in SME credit, showing a strong correlation (0.927). Credit history and previous payment behavior also demonstrate a very high correlation (0.927), suggesting their crucial role in lending decisions. Repayment capacity, although showing a high correlation (0.908), appears to be considered but not the primary criterion. Collateral plays a minor role, with a slightly lower correlation (0.826). References and testimonials, while still relevant, show a slightly lower correlation (0.819).

Component 4 underscores the importance of adequate capital and commercial reputation/integrity in lending decisions to SMEs. Adequate capital is strongly correlated (0.881), indicating its significance. Commercial reputation and integrity also demonstrate a high correlation (0.855), suggesting their importance. However, capital is not the only determining factor, as indicated by its high correlation (0.828). Additionally, the importance of company capital compared to other criteria shows a slightly lower correlation (0.663), suggesting its lesser influence on lending decisions compared to other factors.

Component 5 underscores the significance of repayment capacity and collateral in lending decisions for SMEs, albeit with a nuanced perspective on repayment capacity in SME lending. Repayment capacity shows a strong correlation (0.812), indicating its crucial role in decision-making. Furthermore, collateral proposed by SMEs demonstrates a notable correlation (0.767), suggesting its importance. However, repayment capacity may not be uniformly considered across all SME lending scenarios, as indicated by varying correlations (0.776) in different contexts.

Component 6 emphasizes the importance of information and the effects of information asymmetry on credit requests. Lack of information exhibits a significant negative correlation (0.952), indicating its adverse impact on bank decisions. Similarly, the reliability of information provided by SMEs shows a highly negative correlation (0.952), emphasizing the crucial role of authentic information. Although another variable related to information demonstrates a slightly lower correlation (0.819), it still highlights the importance of credible information in bank decision-making.

Component 7 underlines the significance of the banking history and the SME's credit repayment history with other banks. The client's history with the bank shows a strong correlation (0.870), indicating its pivotal role in decision-making. Similarly, the SME's credit history with other banks demonstrates a slightly lower but still significant correlation (0.819), suggesting its influence on bank decisions.

Component 8 highlights the critical role of trust in the credit applicant and their banking history with other financial institutions. Trust exhibits an overwhelmingly high correlation (0.964), emphasizing its paramount importance in decision-making. Similarly, the banking history with other institutions demonstrates a

comparable correlation (0.964), indicating its significant influence on bank decisions.

Component 9 shows the importance of the bank's collaboration with other organizations as well as the freedom of action granted to staff in meeting customer expectations. Both aspects exhibit a highly positive correlation (0.966), underlining their crucial role in bank decisions.

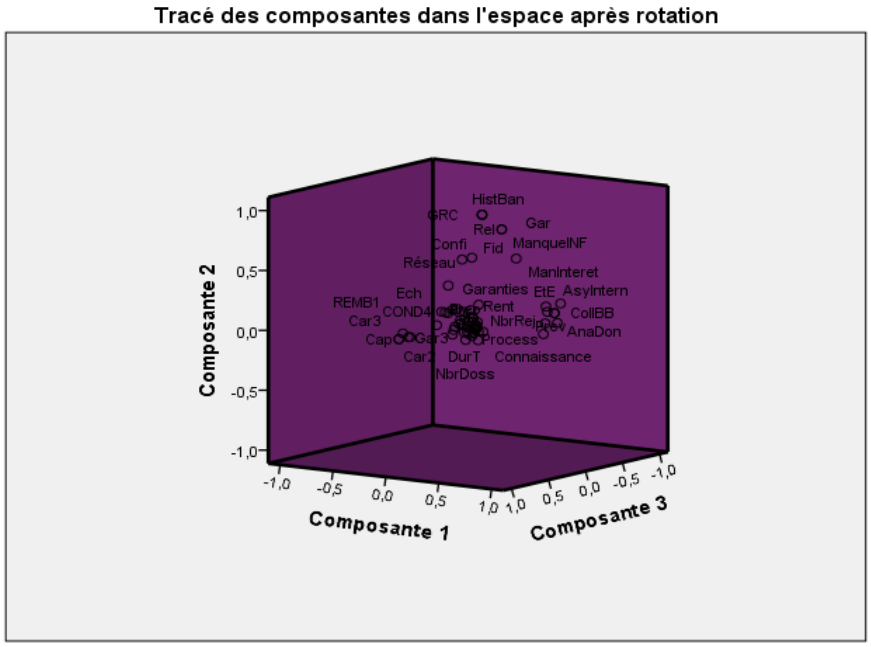
Component 10 relates the impact of the high volume of credit requests and financial limitations on project selection for financing. Both the number of credit requests and the allocated amounts demonstrate a notable correlation (0.772), suggesting their influence on bank decisions.

Component 11 underscores the significance of required guarantees and provided guarantees by SMEs in the credit decision-making process. Both variables exhibit a high correlation (0.912, 0.894), highlighting their importance in bank decisions.

Component 12 highlights the adherence to the repayment duration of previous credits by SMEs with the bank and other financial institutions. Adherence to repayment duration demonstrates a notable correlation (0.884), indicating its impact on bank decisions.

Component 13 encompasses various factors influencing credit decisions, including project profitability, current financial situation of the SME, industry conditions, quality of financial information, preparation of the credit application file, and business size. These factors collectively demonstrate significant correlations (ranging from 0.660 to 0.770), underscoring their influence on bank decisions.

The principal components plot after rotation



From this second principal component analysis (PCA), we obtained the following results based on the initial eigenvalues and the sums extracted from the squared loadings:

The first component explains 30.126% of the total variance, with an initial eigenvalue of 1.808, while the second component accounts for 19.735% of the total variance, bringing the cumulative percentage to 49.861%, with an initial eigenvalue of 1.184. and finally the third component explains 18.379% of the total variance, bringing the cumulative percentage to 68.239%, with an initial eigenvalue of 1.103. The subsequent components also contribute significantly to the total variance, but their individual contributions decrease progressively. PCA effectively reduces the dimensionality of the data while retaining most of the information within the sample. These results suggest that the first three components capture a significant portion of the data's variance, indicating their potential importance in explaining the underlying structure of the studied variables.

Variance totale expliquée

Component	Initial Eigenvalues			Extracted Sums of Squared Loadings	
	Total	% of Variance	Cumulative %	Total	% of Variance
1	1,808	30,126	30,126	1,808	30,126
2	1,184	19,735	49,861	1,184	19,735
3	1,103	18,379	68,239	1,103	18,379
4	,760	12,659	80,899		
5	,705	11,753	92,652		
6	,441	7,348	100,000		

The results of the PCA based on the sums of squared loadings and the sums of squared loadings after rotation are as follows:

The first component explains 30.126% of the total variance, while the second one explains 19.735% and the third one explains 18.379%.

These results provide insights into the contribution of each component to the total variance in the data. The first component accounts for the largest portion of the variance, followed by the second and third components. The cumulative percentages indicate how much variance is explained by the components up to that point in the analysis.

Total Explained Variance

Componant	Sums of Squared Loadings	Sums of Squared Loadings After Rotation		
	% cumulé	Total	% de la variance	% cumulé
1	30,126	1,641	27,344	27,344
2	49,861	1,261	21,025	48,369
3	68,239	1,192	19,871	68,239

The results from the PCA show that the first component accounts for 30.126% of the cumulative variance; the second component explains 19.735% and the third one 18.379%.

The final components are summarized as follows:

Component 1

This component appears to be primarily associated with the credit demand from SMEs. Variables such as "the high number of credit application files from SMEs" and "the guarantees required by the bank" show high correlations with this component. This suggests that Component 1 could represent the level of activity in SME credit applications and the banks' requirements for guarantees.

Component 2

This component seems to be linked to the preparedness of credit applicants in assembling a strong credit application file. Variables like "credit applicants are well-prepared to create a good credit application file" have a strong correlation with this component. This implies that Component 2 could represent the degree of preparation of credit applicants in securing a loan.

Component 3

This component appears to be related to the uniformity of credit application management processes within Algerian banks. The variable "the credit application management processes are identical in Algerian banks" has a high correlation with this component. This indicates that Component 3 could represent the level of standardization of credit application management processes across banks in Algeria.

These three components provide an overview of important factors related to credit demand, the preparedness of credit applicants, and the uniformity of credit application management processes in Algerian banks.

The transformation matrix of components, obtained from principal component analysis using the Varimax rotation method, provides insight representation of the original variables in the extracted components. For the first component, the highest coefficients are found in the first row, indicating that this component is strongly influenced by the variables associated with this row. High coefficients signify a positive correlation between the first component and these variables.

The highest coefficients of the second component are located in the second row. This means that the second component is primarily influenced by the variables associated with this row. Again, high coefficients indicate a positive correlation between the second component and these variables.

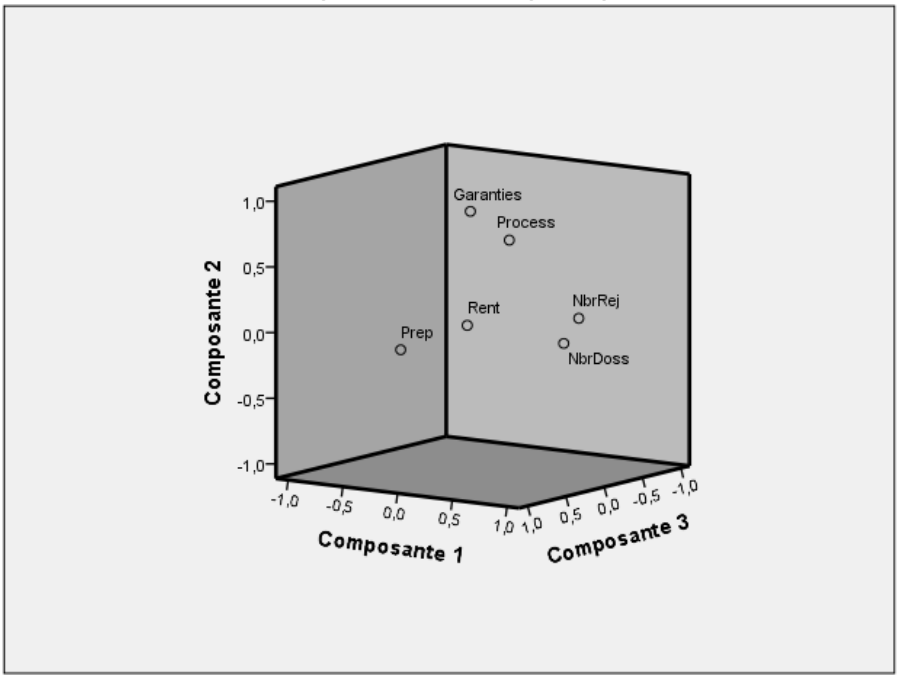
Similarly, for the third component, the highest coefficients are in the third row, suggesting that this component is mainly influenced by the variables associated with this row. High coefficients here also denote a positive correlation between the third component and these variables.

This suggests that each component is associated with a specific set of original variables and that the original variables are weighted differently in each component. This understanding helps to elucidate how the variables are combined to form the extracted components during principal component analysis.

Components transformation matrix

Composante	1	2	3
1	,872	,399	,282
2	,138	-,754	,642
3	-,469	,521	,713

Tracé des composantes dans l'espace après rotation



Conclusion:

In this paper, we have explored the literature on the theory of information asymmetry and its applications in the economic world. We also explored several theories related to information asymmetry, evaluating the strengths and weaknesses of this theory. The theory of information asymmetry is considered an intuitive model of the competitive behavior of economic agents in a given market. We discussed key concepts such as adverse selection, counteracting institutions, signaling, and screening, finding them useful for identifying, analyzing, and even limiting information asymmetry.

We used the PCA to examine the variables and dynamics of credit demand in Algerian banks. This study highlights three main components influencing these practices: collateral requirements, project profitability, and the preparedness of credit applicants. These components provide an overview of critical factors in the credit decision-making process, emphasizing the importance of the guarantees

required by banks, the assessment of project profitability, and the level of preparedness of credit applicants. By significantly reducing the total variance, these components offer a clearer understanding of the essential dimensions that govern credit practices in the Algerian banking sector. This understanding can guide future financial policies and strategies.

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