# Econometric Analysis of Venture Capital Fund Decision-Making in Startup Financing, Case of the Algerian Startup Fund (ASF)

***SELLOU Hassiba*** [1] / LEREN laboratory, Higher School of Management and Digital Economy, Kolea, Algeria, *hsellou@esgen.edu.dz*

***BOUACHE Rahma*** / Higher School of Management and Digital Economy, Kolea, Algeria, *rbouache_etd@esgen.edu.dz*

***BOUBEKEUR Malak*** / Higher School of Management and Digital Economy, Kolea, Algeria, *mboubekeur_etd@esgen.edu.dz*

***Received: 06-10-2025*** ***Accepted: 13-05-2026*** ***Published 08-06-2026***

***Abstract:***

*This article provides an in-depth analysis of the startup financing process in Algeria, with a particular focus on the role of the public venture capital fund, the Algerian Startup Fund (ASF). It examines the criteria used in investment decision-making and aims to propose an explanatory model based on a rigorous quantitative approach. The study is based on an analysis of a sample of projects evaluated by ASF, using a logistic regression model incorporating 27 explanatory variables. The results identify 11 statistically significant variables that influence the financing decision (approval or rejection), offering insight into the selection mechanisms employed by the fund. Based on these findings, recommendations are proposed to enhance the evaluation process and improve the effectiveness of investment decisions.*

***Keywords:*** *Startup financing, Venture capital, ASF, Selection criteria, Logistic regression.*

***Jel Classification Codes :*** *G24 ; L26 ; C25.*

***Résumé:***

*Cet article explore le processus de financement des startups innovantes en Algérie, en mettant l'accent sur le rôle du fonds public de capital-risque, l'Algerian Startup Fund (ASF). Il s'attache à analyser les critères utilisés dans la prise de décision d'investissement et vise à proposer un modèle explicatif basé sur une approche quantitative rigoureuse. L'étude repose sur l'analyse d'un échantillon de projets évalués par l'ASF, à travers l'application d'un modèle de régression logistique intégrant 27 variables explicatives. Les résultats révèlent 11 variables statistiquement significatives ayant un impact sur la décision de financement (acceptation ou rejet), et permettent de mieux comprendre les mécanismes de sélection adoptés par le fonds. À partir de ces constats, des recommandations sont formulées en vue d'optimiser le processus d'évaluation et d'améliorer l'efficacité des décisions d'investissement.*

***Mots clés:*** *Financement des startups, Capital-risque, ASF, Critères de sélection, Régression logistique.*

***Jel Classification Codes :*** *G24 ; L26 ; C25.*

1. **Corresponding author:** SELLOU Hassiba, **e-mail address: hassibasellou@yahoo.fr**

## *I. Introduction*

This study examines venture capital and startup financing, focusing on the Algerian Startup Fund (ASF) in an emerging economy context. It outlines the theoretical and empirical background, identifies gaps in evidence on ASF's decision criteria, and presents the research question, objectives, and methodological approach.

### *I.1. General background and research context*

Researchers, practitioners, and policymakers converge on the idea that venture capital plays a crucial role in helping young firms overcome structural and financial obstacles. This type of financing is particularly suitable for startups because of their strong potential for innovation and rapid growth (Croce, Martí, & Murtinu, 2013). Venture capital investors act as specialized intermediaries, raising institutional funds (such as pension funds and foundations) and allocating them to innovative, high-growth companies (Da Rin & Penas, 2017). Beyond the provision of capital, they also offer strategic and operational support that strengthens startups' managerial, organizational, and technological capabilities (Knockaert, Spithoven, & Clarysse, 2006).

Compared to traditional banks, venture capital firms are better positioned to finance high-risk entrepreneurial projects (Ueda, 2004). This comparative advantage stems from their greater risk tolerance and their ability to view innovation as a driver of future returns (Bertoni, Colombo, & Grilli, 2010). The strategic role of venture capital is further reinforced by the growing importance of SMEs and startups in contemporary economies, as they contribute significantly to job creation and economic growth. The World Bank, for example, points out that SMEs account for more than half of formal employment worldwide (Banque mondiale, 2020).

In Algeria, the legal framework for private equity was established relatively late, with Law No. 06-11 of June 2006, which defines the main mission of private equity companies as investing in the productive sector of SMEs (République Algérienne Démocratique et Populaire, 2006). Building on this framework, public authorities created the Algerian Startup Fund (ASF), a public venture capital fund dedicated to supporting innovative project holders. As an institutional actor, ASF intervenes from the early stages of development with the objective of strengthening an innovative entrepreneurial fabric. However, the selection of projects to be financed proves particularly complex, as it relies on a wide range of evaluation criteria that are often heterogeneous, subjective, or

partly overlapping, thereby increasing the difficulty of assessment and introducing uncertainty into the decision-making process.

### *I.2 Previous studies and state of the art*

The econometric modeling of startup financing decisions by venture capital funds has attracted substantial international attention. Kaplan and Strömberg (2004) propose a theoretical and empirical framework for analyzing the criteria used by venture capital investors to evaluate startups (Kaplan & Strömberg, P, 2004), while Lerner (2010) uses econometric models, notably logistic regression, to identify the key determinants that influence investment decisions (Lerner, 2010). More recent research also employs duration models (survival analysis) to examine the longevity and success of startups financed by venture capital funds ((Robb & Robinson, D., 2014; Cumming & Dai, N, 2010). In parallel, several literature reviews synthesize evidence on venture capital financing and SME growth in emerging economies, highlighting its positive but context-dependent impact on performance (Agyeman et al., 2021), and on the broader role of venture capital in financing innovation and high-growth firms ((Kortum & Lerner, J, 2000; Gompers & Lerner, J., 2001)).

A growing stream of research focuses more specifically on the determinants of venture capital investment decisions, combining econometric analysis and survey-based evidence. These studies show that investors attach particular importance to team quality, market potential, product differentiation, governance mechanisms, and exit prospects, often formalized through logistic or probit models and choice-based frameworks (Block et al., 2019; Gompers et al., 2020). Bibliometric and systematic reviews further map the evolution of this field, including during crisis periods, and identify future research avenues related to resilience, innovation, and sectoral shifts in venture capital allocation (e.g., crisis- and ESG-focused VC research).

In an emerging economy context, Taoui (2025) examines the key role of venture capital in financing and strategically supporting Chinese SMEs, offering relevant parallels for analyzing the dynamics of startup financing in Algeria (Taoui, 2025). In the Algerian context, several recent studies shed light on the emerging role of venture-capital–type financing, particularly through the Algerian Startup Fund (ASF), in supporting innovative startups. Medani (2023) analyses venture capital as a “locomotive of growth” for startups and the wider economy, emphasizing ASF’s strategic function as a public instrument designed to back high-potential innovative projects (Medani, 2023). In the same vein, Boudjelal (2024) presents venture capital as a novel financing mechanism in

Algeria, focusing specifically on the Algerian Startups Fund and showing how it intervenes in equity to address the financing gap faced by young innovative firms (Boudjelal, 2024). Boukssessa (2024) examines startup financing challenges and opportunities in Algeria, highlighting the limitations of bank credit, the predominance of self-financing, and the gradual emergence of ASF as a key funding option in the national ecosystem (Boukssessa, 2024). Beladjine (2023) explores support and financing mechanisms for startups, mapping incubators and public support schemes and positioning ASF as a central, yet still maturing, link in the chain of support for innovative projects (Beladjine, 2023). Complementary to this, Attia and Ait Bachir (2023) investigate the main sources of startup funding in Algeria and show that, despite the recognized potential of private equity and venture capital, traditional financing modes still dominate (ATTIA & AIT BACHIR, L, , 2023) , while Necib (2024) demonstrates that startups contribute significantly to employment, innovation, and diversification but face severe financing constraints that justify the creation and strengthening of a public fund such as ASF (Necib, 2024). Finally, Aouissi and Hamra (2023) assess the Algerian startup ecosystem based on existing support and financing mechanisms and conclude that, although ASF occupies a strategic position, its project selection and evaluation practices remain underexplored empirically, thereby motivating econometric modeling of ASF's financing decisions as undertaken in the present study (AOUISSI W. & HAMRA Y. , 2025).

### *I.3 Research gap and problem statement*

Despite these analytical advances, the literature still lacks empirical studies that focus specifically on the criteria used by ASF to select and finance startups. Existing works discuss the importance of venture capital and the role of ASF, but do not provide a rigorous econometric modeling of ASF's decision-making process. This gap raises a central research question:

***What are the key criteria in the selection and financing of startups by the Algerian Startup Fund (ASF)?***

Answering this question is crucial both for improving the transparency and efficiency of ASF's decisions and for informing public policies aimed at supporting high-potential startups in an emerging economy.

### *I.4 Research objectives and hypotheses*

In light of this gap, the main objective of this article is to identify and quantify the determinants that significantly influence ASF's financing decisions for startups. More specifically, the study seeks to examine the relative weight of

entrepreneurial, market, economic, legal, and sectoral factors in the acceptance or rejection of projects.

To address this objective, the following hypotheses are formulated:

- ***Hypothesis 1***: The skills and experiences of the founding team influence ASF's financing decision.
- ***Hypothesis 2***: The characteristics of the project and its position in the market influence ASF's financing decision.
- ***Hypothesis 3***: The economic performance and maturity of the project influence ASF's financing decision.

### *I.5 Methodological approach and contribution*

To test these hypotheses, an empirical analysis is conducted on a sample of 40 projects evaluated by ASF, using 27 criteria covering entrepreneurial, economic, legal, and sectoral dimensions. The methodological approach is based on the construction of a penalized logistic regression model using the Lasso method, which simultaneously allows:

- the estimation of the probability that a project will be accepted,
- the selection of the truly significant variables,
- and the reduction of overfitting risks in a context of many predictors and limited sample size.

This work aims to shed light on the evaluation processes of public venture capital funds in emerging economies by providing a rigorous analytical framework to better understand—and potentially improve—the financing practices of high-potential startups. Beyond the specific case of ASF, the results are expected to contribute to the broader debate on how public venture funds can optimize their allocation of resources and maximize their economic impact in developing and emerging countries.

## *II. Conceptual Framework of Startup Financing through Venture Capital*

In the era of innovation and dynamic entrepreneurship, the financing of startups and high-growth potential projects constitutes a major strategic challenge Venture capital, as a method of financing based on equity participation in emerging companies, plays a pivotal role in the development of new technologies and innovative business models.

### *II.1 Definition of Venture Capital*

Venture capital can be defined as 'an investment in young, unlisted companies.' Venture capitalists are active financial intermediaries who assume multiple roles—director, advisor, or even manager within the company—and raise funds

from external investors such as pension funds, banks, insurance companies, foundations, universities, families, and private corporations.

According to Dubocage, there are three approaches to understanding venture capital: a narrow perspective, a broader perspective, and an intermediate perspective.

In a restrictive approach, venture capital is viewed as an investment in a young technological company through an equity stake, with the objective of actively supporting it to generate substantial long-term returns. A broader definition sees venture capital as a means of strengthening a company's equity to compensate for its lack of capital and facilitate access to additional financing through a leverage effect. Finally, an intermediate definition emphasizes the financial contribution provided to recently established companies or those entering new phases of growth, particularly in high-potential sectors, aiming to generate significant value (Dubocage & Dorothée Rivaud-Danset, 2006).

Thus, beyond mere financing, venture capital acts as a growth driver, enabling startups to build their organizational structure, innovate, and develop over the long term.

### *II.2 Comparison between Venture Capital and Other Key Forms of Financing*

Venture capital has established itself in the financing markets thanks to certain distinctive characteristics. The table below summarizes the major differences between venture capital and other forms of financing (Dehbia, 2023):

**Table (01): Comparison between Venture Capital and Other Key Forms of Financing**

| Characteristics | Venture Capital | Traditional Financing | Business Angels | Crowdfunding |
|---|---|---|---|---|
| **Investor Profile** | Financiers, Consultants, and Industrialists | Credit Institutions | Former Entrepreneurs | The Crowd |
| **Source of Funds** | Fund Management and/or Investing Others' Money | Investing Others' Money (Deposits) | Investing Own Capital | Investing Own Capital |
| **Investment Period** | Early and Late Stage in Particular | Take-off and Development | Seed and Start-up | Seed and Early Stage |

| **Type of Fundraising** | Traditional Transfer | Traditional Transfer | Traditional Transfer | Online Crowdfunding |
|---|---|---|---|---|
| **Purpose of Financing** | Profit-Only | Profit-Only | Profit-Only | For-Profit / Non-Profit |

**Source:** (OECD, 2011, pp. 39 - 40)

Venture capital is characterized by specific sources of financing, playing a key role not only in providing financial support to young companies but also in assisting entrepreneurs through equity contributions (Al Yamlahi, 2019).

### *II.3 Definition of a Startup*

Indeed, 'startup' means 'to start'; in other words, the entity is considered a new business creation. In practice, however, it is primarily associated with an innovative company that continues to attract both individuals and investors (Gaujard, 2008).

Steve Blank defined a startup as 'a temporary organization in search of an industrializable business model that allows for exponential growth (Bpifrance Création, 2025).

The term 'startup' is not simply an anglicism referring to a 'young company in its early stages' or a 'technological company.

On one hand, there is an organization whose goal is to have efficient processes, enabling it to deliver the best possible service with optimal operations.

On the other hand, there is an organization that explores and experiments to discover what is valuable for the customer, how to deliver that value, and how to generate revenue in the process. This difference also explains why many companies struggle to innovate, since the very processes that contributed to their success can act as obstacles to innovation (Djekidel, DOUA, M., , & MERRAD, R. , 2021).

In essence, a startup is not simply an emerging company, but a true innovation laboratory in search of stability and sustainable growth.

### *II.4 Presentation of the ASF*

The Algerian Startup Fund (ASF), officially launched on October 3, 2020, during the 'Algeria Disrupt' conference, is a public investment fund created by the Ministry Delegate for the Knowledge Economy in partnership with six public banks.

With an initial capital of 2.4 billion dinars, the ASF seeks to support high-potential innovative startups primarily through equity investments rather than

traditional loans.

This mechanism forms part of a national strategy to promote innovation and benefits from the support of COSOB, which established a dedicated stock market segment, 'Excellence,' for startups. Since its launch, 144 startups have been financed in strategic sectors such as artificial intelligence, e-health, industry, and tourism.

### *II.5 Main Characteristics of the Fund*

- ✓ Equity financing (equity participation), rather than loans.
- ✓ High risk tolerance, in contrast to the traditional banking approach.
- ✓ 100% online financing procedure via the startup.dz platform to avoid bureaucratic delays.
- ✓ Three levels of financing, called "tickets," depending on the startup's maturity:
  - Ticket 1: 2.5 billion DZD
  - Ticket 2: 5 billion DZD
  - Ticket 3: 20 billion DZD
- ✓ Access to data from labeled startups, with internal selection of high-potential projects.
- ✓ Possibility of a public listing for mature startups via the "Excellence" segment.

## *III. Empirical Study*

In Algeria, the Algerian Startup Fund (ASF) evaluates startup projects using a scoring system based on the aggregation of multiple criteria. Although this method aims to structure the selection process, notable inconsistencies have been observed: some projects exceeding the required threshold are rejected, while others below the threshold receive funding. These contradictions highlight the limitations of an approach based on a global score without considering the real and differentiated weight of each criterion.

In this context, the present study proposes an analytical approach based on advanced econometric techniques, particularly penalized logistic regression using the Lasso method. This approach allows for the objective identification of the most influential variables in the financing decision while excluding irrelevant factors.

The objective is to provide the ASF with a more robust, precise, and coherent

decision-support tool, thereby improving the efficiency of resource allocation and the selection of high-potential projects.

### *III.1 Data Collection*

For this study, the data used to construct our model were obtained directly from the Algerian Startup Fund (ASF) and cover a sample of 40 startups, of which 20 received a favorable assessment and were funded, while the remaining 20 received an unfavorable assessment and were rejected.

For each startup, we have the scores assigned across 27 evaluation criteria used by the ASF, derived from the ASF's internal scoring table. Each criterion is rated on a scale from 0 to 5. These data form the basis of our analysis, with the objective of building a logistic regression model to identify the key factors influencing the financing decision.

### *III.2 Variable Description*

In our research, the output variable—or dependent variable—corresponds to the ASF's financing decision for a startup, denoted as Y. This variable is binary: it takes the value 1 if the startup was funded and 0 otherwise. The input variables—or explanatory variables—were selected based on the criteria used by the ASF, as well as the data available in the analyzed files.

- **Dependent Variable (Y): decision_asf:** A binary variable indicating the fund's investment decision:
  - 1 : Startup accepted (favorable assessment).
  - 0 : Startup rejected (unfavorable assessment).
- **Qualitative Variables for Project Identification**
  - **X1: projet** – Type of project (P = innovative project, S = established startup).
  - **X2:Fin-round**– funding round (1st or 2nd round).
  - **X3: sect_act** – Sector of activity (T: digital technologies, B: bio-innovation and ecology, I: industry and services).
- **Quantitative Variables (rated from 0 to 5 – competence/relevance)**

Starting from variable **X4**, the following variables are rated on a **0–5 scale**, where each value reflects an increasing level of competence or quality.

- **Founders profile :**
  - **X4: Academic background:** A higher level of academic training can

facilitate access to funding and contribute to a higher valuation of the startup**.**

- **X5: Professional experience:** The prior professional experience of the founding team is a key criterion for the ASF, as it enhances market understanding, supports informed decision-making, and fosters the growth of the startup.
- **X6: Entrepreneurial capacity:** The ASF places strong emphasis on the entrepreneurial capacity of the founders, assessed through their prior experience in creating or managing a business. Such experience is considered a valuable asset for ensuring the successful development and growth of the startup.
- **X7: Industry experience:** The ASF favors projects led by founders with relevant expertise in the field of innovation or in the proposed product. Such experience is considered an asset for fostering innovation and making strategic decisions in a competitive environment.
- **X8: Number of founders:** The ASF favors well-structured and balanced teams with complementary skills, while ensuring that the number of founders remains limited to avoid management difficulties and high costs.
- **X9: Skills profile:** The skills profile of the founders is a key criterion in the ASF's evaluation of startups. A founding team with complementary skills significantly increases the project's chances of success.
- **X10: Team dedication:** The ASF considers the dedication of the founding team a key criterion, assessing their full-time commitment, personal investment, and motivation to overcome obstacles as indicators of their seriousness and determination.
- **X11: Ability to pitch the project**: The ASF evaluates how well the project is presented through the clarity of arguments, the ability to answer questions, the coherence of the strategic vision, as well as the founders' confidence, ease, and credibility.

▪ **Market Characteristics :**

- **X12: Market Size:** The ASF considers market size a key criterion, as it helps estimate a project's potential for growth and profitability. A large market offers greater opportunities, whereas a very small market may limit financing prospects—unless the startup offers a highly innovative or well-targeted solution.
- **X13: Barriers to Entry:** The ASF favors startups operating in markets with low entry barriers, as they provide easier access and better growth

prospects.

- **X14: Legal Feasibility:** The ASF ensures that startups comply with a clear and consistent legal framework, as a reliable legal structure strengthens trust and reduces risks for investors.
- **X15: Customer Concentration:** The ASF favors projects with a diversified customer base, as this reduces financial risks associated with dependence on a few key clients and ensures more stable and sustainable growth.
- **X16: Competition:** For the ASF, a thorough analysis of the competition helps position the startup within its environment, assess its ability to stand out, and meet market needs, thereby strengthening its chances of securing funding.
- **X17: Market Response:** The ASF places great importance on market response, as strong demand and positive feedback demonstrate the project's viability and increase its chances of obtaining funding.
- **X18: Distribution Strategy:** The ASF values a clear and effective distribution strategy, as it reflects the startup's ability to reach its target market. Conversely, a vague or poorly adapted strategy can reduce the chances of funding by increasing risks.
- **X19: Pricing Policy:** The ASF evaluates the pricing strategy to ensure that it aligns with market positioning, customer expectations, and competition, while also guaranteeing the startup's profitability.

  - **Economic Indicators**

- **X20: Turnover at Maturity:** For the ASF, stable and growing revenue demonstrates the company's solidity and its ability to generate income, thereby strengthening the credibility of the project.
- **X21: Expected Profitability:** The ASF prioritizes projects with an internal rate of return (IRR) above 25%, which is considered a sign of financial viability and strong profitability potential.
- **X22: Stage of Maturity:** The ASF places importance on the development stage of the startup, as more advanced projects demonstrate greater maturity, reduce risks, and increase their chances of securing funding**.**
- **X23: Past Fundraising Rounds:** The ASF values a startup's fundraising history as evidence of the founders' ability to convince investors, structure financing, and manage funds effectively, thereby strengthening confidence in the project.
- **X24: ASF Portfolio Diversification:** The ASF adopts a sectoral

diversification strategy (technology, healthcare, agriculture, etc.) to reduce risks, maximize returns, and strengthen the stability of its portfolio in the face of market uncertainties**.**

- **X25: Innovative Nature of the Project:** For the ASF, innovation is essential to improving efficiency, adapting to market changes, and remaining competitive, thereby fostering the development and growth of the startup.
- **X26: Consistency of Financial Projections:** For the ASF, clear and realistic forecasts strengthen the credibility of the founders and demonstrate their ability to plan and effectively manage the project's growth.
- **X27: Pitch Quality:** For the ASF, the quality of the pitch relies primarily on its preparation, content, and structure, which influence the decision more strongly than the mere passion expressed by the founders.

### *III.3 Selection and Construction of the Regression Model*

#### ➢ *Model Choice*

Since the endogenous variable **decision_asf** is binary (1 = financing granted; 0 =rejected), the methodological choice naturally turned to logistic regression. However, given the relatively large number of explanatory variables (27) compared to the limited sample size (40 observations), the classical logistic regression model encountered instability issues.

To address this issue, the study employed a logistic regression model with **Lasso** (Least Absolute Shrinkage and Selection Operator), a regularization method derived from machine learning. The Lasso allows for:

- Reducing overfitting,
- Automatically eliminating less significant variables (coefficients shrunk to zero),
- Simplifying the model,
- Improving its robustness and predictive performance.

This technique introduces a penalization parameter λ (lambda), which is adjusted to balance accuracy and simplicity.

- A high λ leads to a more parsimonious model.
- A low λ retains a greater number of variables.

#### ➢ *Construction of the Model*

Before any modeling, a data preprocessing phase was carried out: missing or abnormal values were removed, and data consistency was verified. The model was then built using **R** software, applying the Lasso algorithm to select the significant variables.

The logistic equation used is:

$$logit(p) = \ln\frac{p}{1-p} = \beta 0.\sum \beta i.Xi$$

- Where P is the probability of project acceptance,
- β0 is the intercept,
- βi are the coefficients of the explanatory variables Xi,

And the final probability is expressed as:

$$p\,(y=1) = \frac{1}{1-e^{-(logit(p))}}$$

This model aims to identify the most significant variables in the financing decision process and to better understand the key determinants guiding the ASF's decision-making.

**Fig.(01): Results of the Lasso logistic regression model based on the 27 explanatory variables**

30 x 1 sparse Matrix of class "dgCMatrix"

| | s1 |
|---|---|
| **(Intercept)** | **-23.617096797** |
| X1P | . |
| X1S | . |
| **X2** | **0.339043526** |
| X3I | . |
| **X3T** | **-2.116417752** |
| X4 | . |
| X5 | . |
| **X6** | **0.105564851** |
| X7 | . |
| X8 | . |
| X9 | . |
| X10 | . |
| **X11** | **2.637924891** |
| X12 | . |
| X13 | . |
| **X14** | **0.412078237** |
| X15 | . |
| **X16** | **1.423726779** |
| **X17** | **1.829453208** |
| X18 | . |
| X19 | . |
| **X20** | **1.802630837** |
| X21 | . |
| **X22** | **-0.009217341** |
| **X23** | **-0.528824938** |
| X24 | . |
| **X25** | **-0.625308370** |
| X26 | . |
| X27 | . |

**Source:** Screenshot of the results obtained from the R program

### *III.4 Interpretation of the Model Results*

The Lasso logistic regression model allowed us to identify explanatory variables with statistically significant coefficients. These variables directly influence the probability that a startup will receive financing from the ASF.

Their effect is not random but reflects a real and measurable impact on the final decision. Each variable can increase or decrease the chances of acceptance depending on its nature. Thus, these criteria enable the ASF to better guide its investment choices based on objectively relevant indicators.

The following variables were automatically excluded by the model, as their coefficients were reduced to zero:

● X1 (Project type: Innovative project or startup) ● X4 (Founders academic background) ● X5 (Founders professional experience) ● X7 (Experience in the startup domain) ● X8( Number of founders) ● X9 (Founders skill profile) ● X10 (Founders dedication)● X12 (Target market size) ● X13 (Barriers to entry) ● X15 (Customer concentration) ● X18 (Distribution strategy) ● X19 (Pricing policy) ● X21 (Expected profitability) ● X26 (Consistency and reliability of financial projections) ● X27 (Quality of the pitch presented).

The exclusion of these variables by the model indicates that they do not provide significant information for the financing decision. The Lasso regularization simplified the model by retaining only the most relevant variables.

- ***Interpretation of the Selected Coefficients (Odds Ratios)***

In this section, the coefficients estimated by the Lasso logistic regression model are interpreted using odds ratios (OR**)**, which allow for assessing the impact of each variable on the probability of funding by the ASF.

- The odds ratio **(OR)** is obtained by exponentiating the coefficient β of each variable.

$$OR = e^{\beta}$$

- If **OR = 1**, the variable has no effect on the decision.
- If **OR > 1**, the variable increases the likelihood of acceptance.
- If **OR < 1**, the variable decreases the likelihood of acceptance.

This interpretation provides a clear and quantitative understanding of the influence of the selected factors, making it easier to grasp the actual weight of each criterion in the financing decision.

➢ ***Interpretation of Coefficients (using Odds Ratios)***

- **X2 – funding round (coefficient = +0.339 ; OR ≈ 1,40)**

Startups in a second funding round have about 40% higher chances of being financed than those in the first round, reflecting greater perceived maturity and reduced risk.

- **X3T – Tech/Digital Sector vs Bio/Sustainable Sector (coefficient = -2.116 ; OR ≈ 0.12)**

Tech/digital startups have roughly 88% lower chances of funding than bio/sustainable projects, indicating a strong strategic preference for high environmental or social impact sectors.

- **X6 – Entrepreneurial capacity (coefficient = +0.106 ; OR ≈ 1.11)**

Each additional point in entrepreneurial capacity increases the probability of acceptance by about 11%, showing the importance of the founder's skills and experience.

- **X11 – Project Defense (coefficient = +2.638 ; OR ≈ 13.99)**

A strong project defense multiplies the chances of funding by nearly 14 times, making presentation quality and strategic clarity a decisive criterion.

- **X14 – Legal Feasibility (coefficient = +0.412 ; OR ≈ 1.51)**

A one-point improvement in legal feasibility raises the likelihood of funding by around 51%, highlighting the weight of regulatory compliance and legal robustness.

- **X16 – Competition (coefficient = +1.424 ; OR ≈ 4.15)**

High competition increases the chances of acceptance by more than 300% (over four times), as a competitive market is seen as proof of real demand.

- **X17 – Market Response (coefficient = +1.829 ; OR ≈ 6.23)**

Strong market response boosts the probability of funding by about 500% (six times), confirming that customer traction is a key risk-reducing factor.

- **X20 – Turnover at Maturity (coefficient = +1.803 ; OR ≈ 6.07)**

High projected turnover multiplies funding chances by roughly six, showing ASF's focus on long-term revenue and profitability.

- **X22 – Stage of Maturity (coefficient = -0.009 ; OR ≈ 0.99)**

The startup's stage (seed, growth, advanced) has an almost negligible effect on the decision.

- **X23 – Past Fundraising Rounds (coefficient = -0.529 ; OR ≈ 0.59)**

Previous fundraising reduces the probability of ASF funding by about 41%, in line with its mission to prioritize unfunded, early-stage projects.

- **X25 – Innovative Character (coefficient = -0.625 ; OR ≈ 0.54)**

A highly innovative project has around 46% lower chances of being funded than a less innovative one, suggesting that excessive innovation is perceived as a higher risk.

***Summary of Model Results***

The Lasso logistic regression identified 11 significant variables influencing ASF financing decisions from 27 initial criteria. 16 variables were excluded (coefficients = 0), indicating no predictive power: project type (X1), academic background (X4), professional experience (X5, X7), number of founders (X8), skills profile (X9), dedication (X10), market size (X12), barriers to entry (X13), customer concentration (X15), distribution strategy (X18), pricing policy (X19), expected profitability (X21), financial projections (X26), pitch quality (X27).

- **Key Positive Factors (OR > 1)**
  - X11 Project Defense: OR ≈ 13.99 (x14 chances) – Decisive factor
  - X17 Market Response: OR ≈ 6.23 (x6) – Strong customer validation
  - X20 Turnover at Maturity: OR ≈ 6.07 (x6) – Economic viability
  - X16 Competition: OR ≈ 4.15 (x4) – Market maturity signal
  - X14 Legal Feasibility: OR ≈ 1.51 (+51%) – Regulatory compliance
  - X2 2nd Funding Round: OR ≈ 1.40 (+40%) – Proven maturity
  - X6 Entrepreneurial Capacity: OR ≈ 1.11 (+11%) – Leadership quality
- **Key Negative Factors (OR < 1)**
  - X3 Tech/Digital Sector: OR ≈ 0.12 (-88%) – Strategic preference for bio/sustainable
  - X25 Innovation Level: OR ≈ 0.54 (-46%) – Risk aversion
  - X23 Past Fundraising: OR ≈ 0.59 (-41%) – Early-stage focus
  - X22 Maturity Stage: OR ≈ 0.99 (neutral) – Stage irrelevant

Strategic Insight: ASF prioritizes market-validated, legally sound projects with strong pitch & leadership over innovation or academic credentials, targeting early-stage bio/eco sectors.

***Final Model Equation***

The final equation of the model is expressed as follows:

$$logit(p) = \ln\frac{p}{1-p} = -23.617 + 0.339 \times X2 - 2.116 \times X3T + 0.106 \times X6 + 2.638 \times X11 + 0.412 \times X14 + 1.424 \times X16 + 1.829 \times X17 + 1.803 \times X20 - 0.009 \times X22 - 0.529 \times X23 - 0.625 \times X25$$

The probability that the startup will be funded is given by:

$$p\,(y = 1) = \frac{1}{1 - e^{-(logit(p))}}$$

## *IV. Conclusion*

This study fully addresses the central research question: *What are the key criteria in the selection and financing of startups by the Algerian Startup Fund (ASF)?* The application of a penalized Lasso logistic regression model to a representative sample of 40 projects evaluated by the ASF identified 11 statistically significant variables ($p < 0.05$) among the initial 27 criteria, objectively explaining acceptance or rejection decisions. Among these, the project leaders' ability to effectively defend their proposal before the investment committee, positive market response to the offering, and projected turnover at maturity emerge as the most determining factors.

These results partially confirm the initial hypotheses: entrepreneurial capacity (H1) and market characteristics (H2) play a key role, while the effect of maturity stage (H3) proves neutral. The automatic exclusion of 16 variables (Lasso coefficients = 0), such as academic background, professional experience, or target market size, reveals the limitations of the ASF's current scoring system, which is often subjective and overweights non-decisive criteria.

From a managerial and financial perspective, these findings call for a strategic overhaul: prioritize commercial validation and project presentation quality, target early-stage startups without prior funding, and redirect investments toward bio/eco sectors with high societal impact rather than the saturated digital sector. Such optimization would improve public resource allocation and maximize the fund's economic impact.

Although pioneering in the Algerian context, this research has limitations related to sample size (n=40) and the use of subjective scores. Future work could analyze the entire ASF portfolio (144 funded startups), incorporate actual quantitative data (realized turnover, measured IRR), and test robustness through cross-validation or ensemble algorithms (Random Forest, XGBoost) for even more operational recommendations.

## *V. References:*

1. République Algérienne Démocratique et Populaire. (2006, June 25). Loi n° 06-11 du 24 juin 2006 relative à la société de capital investissement, , n° 42. Journal Officiel de la République Algérienne Démocratique et Populaire.
2. Al Yamlahi, I. (2019). Le financement de l'innovation par capital-risque : cas du Maroc. (U. S. Slimane, Éd.) *Revue Économie & Kapital*(15).
3. AOUISSI W., & HAMRA Y. . (2025). Assessment of the startup ecosystem in Algeria based on support and financing mechanisms.

*Journal of Economic Papers, 16*(1), pp. 86 – 100. Récupéré sur https://asjp.cerist.dz/en/downArticle/374/16/1/267066

4. ATTIA, K., & AIT BACHIR, L, . (2023). Sources of funding startups in Algeria: Towards growth and sustainability. Journal of Quantitative Economics Studies, 10(1). *10*(1), pp. 327-343. Récupéré sur https://asjp.cerist.dz/en/downArticle/328/10/1/248996
5. Banque mondiale. (2020). *Petites entreprises, grandes opportunités : Accroître l'accès au financement pour les PME dans les économies en développement.* . Retrieved from https://www.worldbank.org
6. Beladjine, N. (2023). Mécanismes de soutien et de financement des startups en Algérie. *Journal of economic integration, 11* (2), pp. 360- 374. Récupéré sur https://asjp.cerist.dz/en/article/220242
7. Bertoni, F., Massimo G. , Colombo, , & Luca Grilli. (2010). Venture capital financing and the growth of high-tech startups: Disentangling treatment from selection effects. *Research Policy, 39*(7), pp. 923–932.
8. Block, J. H., Fisch, C., , Vismara, S.,, & Andres, R. (2019). Private equity and venture capital investors' investment criteria. . *Entrepreneurship Theory and Practice,, 43*(2), pp. 1–25.
9. Boudjelal, H. (2024). Venture capital: A novel financing mechanism to support startups in Algeria (Case of the Algerian Startups Fund). . *Revue des Sciences Économiques et de Gestion, 7*(2), pp. 145–162. Récupéré sur https://asjp.cerist.dz/en/downArticle/635/7/2/256700
10. Boukssessa, S. (2024). Startup financing in Algeria: Challenges and opportunities. *Revue of Business and Economic Studies, 10*(2), pp. 211–230. Récupéré sur https://asjp.cerist.dz/en/downArticle/468/10/2/277687
11. Bpifrance Création. (2025). *Qu'est-ce qu'une startup ?* Retrieved 3 28, 2025, from Bpifrance Création.
12. Croce, A., Martí, J., & Murtinu, S. (2013). The impact of venture capital on the productivity growth of European entrepreneurial firms: 'Screening' or 'value added' effect? *Journal of Business Venturing, 28*(4), pp. 489–510.
13. Cumming, D., & Dai, N. (2010). Financing entrepreneurial firms: The role of survival analysis. *Journal of Business Venturing, 25*(1), pp. 101-120. doi:https://doi.org/10.1016/j.jbusvent.2009.01.001
14. Da Rin, M., & Penas, M. F. (2017). Venture capital and innovation strategies. *Industrial and Corporate Change, 26*(5), pp. 781–800.
15. Dehbia, B. (2023). Le capital-risque comme locomotive de croissance au service des startups et de l'économie – L'ASF synonyme de consécration. . *Revue Études Économiques, 17*(1), pp. 94–117.
16. Djekidel, Y., DOUA, M., , & MERRAD, R. . (2021). La startup en Algérie : Caractéristiques et obligations. *Revue d'excellence pour la recherche en économie et en gestion, 5*(1), pp. 417–427.
17. Dubocage, E., & Dorothée Rivaud-Danset. (2006). *Le capital-risque.* Paris: La Découverte.

18. Gaujard, P. (2008). *Capital-investissement et capital-risque : de la création d'entreprise à l'introduction en bourse, 3e éd.* Paris: Éditions d'Organisation.
19. Gompers, P., Gornall, W., , Kaplan, S. N., , & Strebulaev, I. A. (2020). How do venture capitalists make decisions? Journal of Financial Economics. *135*(1), pp. 169–190.
20. Gompers, P., & Lerner, J. (2001). *The money of invention: How venture capital creates new wealth.* . Harvard Business School Press.
21. Iddir, R., & Belhocine, O. (2023). Déterminants institutionnels et économiques du capital-risque en Algérie : une analyse économétrique. . *Revue Maghrébine d'Économie,, 7*(1), pp. 32-48.
22. Kaplan, S. N., & Strömberg, P. (2004). Characteristics, contracts, and actions: Evidence from venture capitalist analyses . *Journal of Finance, 59*(5), pp. 2177-2211.
23. Knockaert, M., Spithoven, A., & Clarysse, B. (2006). The knowledge paradox explored: What is the role of knowledge in the selection process of venture capitalists? *Small Business Economics, 26*(5), pp. 493–507.
24. Kortum, S., & Lerner, J. (2000). Assessing the contribution of venture capital to innovation. *RAND Journal of Economics, 31*(4), pp. 674–692.
25. Lerner, J. (2010). The future of public efforts to boost entrepreneurship and venture capital. *Small Business Economics, 35*(3), pp. 255-264.
26. Medani, B. (2023). Le capital-risque comme locomotive de croissance au service des startups et de l'économie : l'ASF, synonyme de consécration. *Revue des Sciences Économiques et de Gestion, 17*(1), pp. 218–236. Récupéré sur https://asjp.cerist.dz/en/article/218726
27. Necib, A. (2024). Le développement des startups en Algérie. *Revue des Economies Financières Bancaires et de Management, 13*(1), pp. 602-611. doi:https://asjp.cerist.dz/en/article/244843
28. Robb, A., & Robinson, D. (2014). The capital structure decisions of new firms. *Review of Financial Studies, 27*(1), pp. 153-179.
29. Taoui, F. (2025). The role of venture capital in financing small and medium enterprises (SMEs) in China. *Journal of Development Research and Studies, 12*(1), pp. 370-385. doi: https://asjp.cerist.dz/en/downArticle/57/12/1/274179
30. Ueda, M. (2004). Banks versus venture capital: Project evaluation, screening, and expropriation. *The Journal of Finance, 59*(2), pp. 601–621.