

**CONTRIBUȚII PRIVIND INOVAREA ÎN ANTREPRENORIATUL ȘI MANAGEMENTUL AFACERILOR DIN CADRUL
FINANȚARILOR NERAMBURSABILE**

UNIVERSITY POLITEHNICA of BUCHAREST

DOCTORAL SCHOOL OF INDUSTRIAL AND ROBOTICS ENGINEERING

PHD THESIS SUMMARY

**CONTRIBUTIONS REGARDING INNOVATION IN ENTREPRENEURSHIP AND
BUSINESS MANAGEMENT FINANCED THROUGH NON-REIMBURSEABLE FUNDS**

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**BUCHAREST
2023**

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Introduction

In the current context, entrepreneurship and innovation are considered to be the most important elements that can stimulate the economy. As a result of the global economic crisis, the notion of an entrepreneur has gained special importance, being seen as a key factor in economic development. These two elements, entrepreneurship and innovation, are considered essential for sustainable economic growth and are seen as the most important drivers of the economy.

Creating new strategies and concepts is essential to address current economic challenges. Entrepreneurship and innovation are necessary to generate new ideas that have a positive impact on the economic environment. Designing rigorous and fair economic policies can provide development opportunities and stimulate economic dynamism, thus offering a sustainable solution to get out of the crisis. Therefore, it is essential to create new strategies and concepts that provide creative and innovative solutions to current economic challenges. This can be achieved by exploring new ideas and improving economic policies, thus generating a high level of perplexity and burstiness.

According to American specialists, the entrepreneur is the person responsible for initiating legal changes in business, whether they hold a managerial position in a company or are at the beginning of a business career. They stand out for their ability to use the factors of production (labor, land, and capital) to develop new and innovative products or services.

In Chapter I, we discussed entrepreneurial management which is an agile and innovative approach to business management, with a focus on adaptability and identifying untapped opportunities. This perspective is based on innovation, creativity, and flexible approaches to meet the continuously changing market demands. The main concepts include innovation, identifying opportunities, risk-taking, creativity, adaptability, and sustainable development. These are essential for success in a dynamic and competitive business environment.

Chapter II highlights the current situation of the business environment in Romania, reflecting the challenges and opportunities in a changing economic landscape. In this context, the circular economy is becoming increasingly important, promoting waste reduction and resource regeneration.

The auditing of businesses funded by non-refundable funds is essential for verifying the efficient use of these resources and compliance with regulations. In the context of a circular economy, auditing focuses on integrating principles of recycling and reusing into activities.

Thus, promoting a circular economy in the business environment and conducting appropriate audits of funded projects can contribute to a more sustainable, efficient, and competitive economy, considering the reduced impact on the environment.

Chapter III highlights the analysis of the financial sustainability of small and medium-sized enterprises (SMEs) that benefit from European funding, whether it is refundable or non-refundable. This aspect becomes crucial in ensuring the continuity and sustainable development of these businesses, considering the complexity of the business environment and current economic challenges.

The study focuses on the long-term evaluation of how small and medium-sized enterprises manage the financial resources received from European sources, whether they are in the form of repayable loans or non-repayable grants. It investigates how these funds are used to increase

production capacity, develop innovative products or services, improve infrastructure, and enhance competitiveness.

In addition, the potential for integrating research infrastructures into European Union-funded SME activities is being analyzed. Such infrastructures can range from research and development laboratories to innovation centers and business incubators. The investigation focuses on how these infrastructures can support SMEs in the development and implementation of projects, thereby contributing to the increase of their financial sustainability and market position consolidation.

In Chapter IV of the work, a comprehensive statistical quantitative and financial analysis was performed regarding the impact of European funds on 198 beneficiaries. This chapter represents a crucial stage in evaluating the effectiveness and relevance of European investments in the development and support of the selected beneficiaries.

Statistical analysis was conducted by collecting and processing data from the 198 beneficiaries. Descriptive analysis methods were used to highlight the general characteristics of the beneficiaries, such as the industry they operate in, the size and location of their businesses.

Regarding financial analysis, the data related to investments made within European Union-funded projects, as well as the financial outcomes achieved through the implementation of these projects, have been evaluated. Key indicators such as revenue growth, return on investment, increase in the number of employees, and the level of innovation brought to the beneficiaries' activities have been examined.

Through this analysis, the aim was to determine to what extent European funds have contributed to the development and strengthening of the beneficiaries' businesses. Successes and challenges encountered during the implementation of funded projects were identified, as well as the impact of these projects on the local business environment and the community as a whole.

In conclusion, Chapter IV provides a detailed and objective perspective on the impact of European funds among the 198 beneficiaries. This analysis highlights the concrete effects of European investments in supporting local and regional economic development, thereby contributing to the foundation of future decisions regarding the allocation and management of financial resources within European projects. Additionally, in this chapter, based on the conducted analyses and research, we have developed two highly important diagrams through which the funding mechanism for startups and the existing legal format of startups receiving funding in Romania can be visualized. The correlation of these two diagrams led me to formulate an innovative concept for a new legal entity format capable of receiving funding, which I have named "GSC - Green Start-up Concept."

In Chapter V, titled "General Conclusions, Proposals, and Future Research Directions," a synthesis of the entire research is presented, and guidelines for the future of the addressed field are outlined. This chapter represents a crucial moment where the main conclusions and implications of the research are extracted, along with proposals for further development and the identification of future directions worthy of in-depth exploration.

The general conclusions are based on the results obtained in the previous chapters and highlight the key findings of the research. These conclusions can underscore the impact of European investments on the local business environment, the benefits brought by projects funded by European funds, as well as the challenges and obstacles encountered in the implementation process.

The proposals constitute an essential part of this chapter, suggesting solutions and directions for improving how European funds can be managed and utilized in the future. These proposals can address aspects such as optimizing the beneficiary selection process, enhancing

the monitoring and evaluation of funded projects, developing training and consultancy programs for beneficiaries, and more.

The future research directions serve as a guide for researchers and professionals in the field who wish to continue investigations in this subject. These directions may include aspects such as expanding research to new categories of beneficiaries, conducting comparative analyses with other European countries, exploring the sustainable impact of funded projects in a broader context, as well as addressing emerging issues related to the circular economy and sustainability.

Overall, Chapter V represents a solid conclusion to the entire work, providing an overview of the obtained results and the directions in which research could evolve in the future. This chapter highlights the importance of research and the applicability of its results in the current context of European-funded businesses, serving as a foundation for future decision-making and actions.

Chapter I. Introduction to Entrepreneurial Management

After an exhaustive analysis of successful entrepreneurs in Romania, the relevant ministry has identified the key traits that have contributed to their business success. Among the most significant characteristics are: initiative, creativity, a focus on results, and the ability to adapt to market changes. These qualities have allowed entrepreneurs to quickly adjust, improve their products and services, and stay ahead of the competition in a highly competitive business environment.

In addition to these traits, these entrepreneurs have demonstrated remarkable perseverance and courage in achieving their goals. They have managed to differentiate themselves from other competitors and solidify their market position.

The relevant ministry has found that successful entrepreneurs in Romania possess a unique combination of traits that enables them to adapt quickly to changes and stay ahead of the competition. These traits include initiative, creativity, a results-oriented mindset, perseverance, and the courage to embrace change. Through this combination of qualities, they succeed in setting themselves apart from others and strengthening their market position.

Regarding risk-taking, entrepreneurs face a significant challenge. Instead of deliberately seeking risk, they try to control it through planning and preparation. A young entrepreneur can reduce risk by carefully selecting products and markets, using creative financing, conducting thorough planning, and building a strong, competitive, and trustworthy team. However, the risk associated with starting a business remains one of the biggest challenges for entrepreneurs.

Entrepreneurial spirit brings at least three economic advantages to society:

1. **Accelerating Economic Growth:** Entrepreneurs drive economic development by creating new businesses, generating job opportunities, and stimulating consumption. Through innovation and adaptability, entrepreneurs contribute to the economic growth of a community or a country.
2. **Increasing Labor Productivity:** Entrepreneurs frequently bring innovative solutions, advanced technologies, and efficient working methods, leading to improved labor productivity in various economic sectors. By implementing more efficient processes and optimizing resource utilization, entrepreneurs contribute to enhanced economic performance and efficiency.
3. **Creating New Technologies, Products, and Services:** Entrepreneurs are engines of innovation, introducing new technologies, products, and services to the market. These innovations can revolutionize industries, address new or existing needs more effectively, and bring significant benefits to both consumers and the economy as a whole.

The percentage of young entrepreneurs under the age of 30 has been on a consistently upward trend since 2001. Legislative measures related to young people, as well as entrepreneurial education programs initiated in previous years, have contributed to the entrepreneurial development of young Romanians.

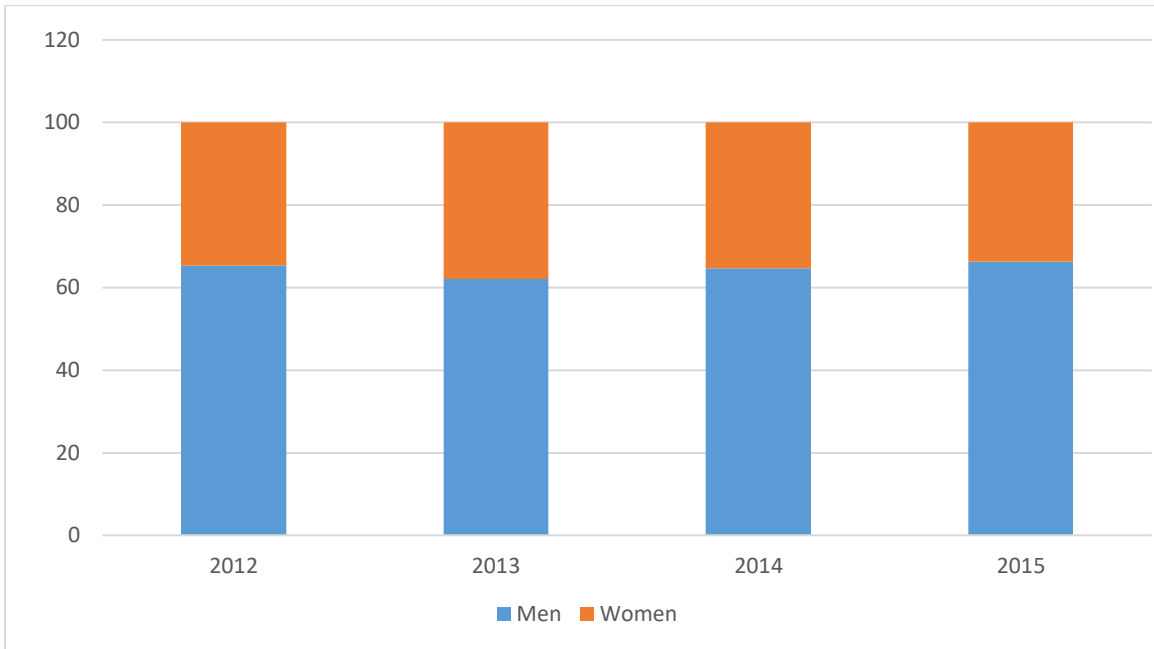


Fig I.1 - The distribution of newly established active enterprises by the gender of the founder/manager during the period 2012-2015.

It can be observed from the graph that women's participation in starting new businesses is in a significantly lower proportion compared to that of men.

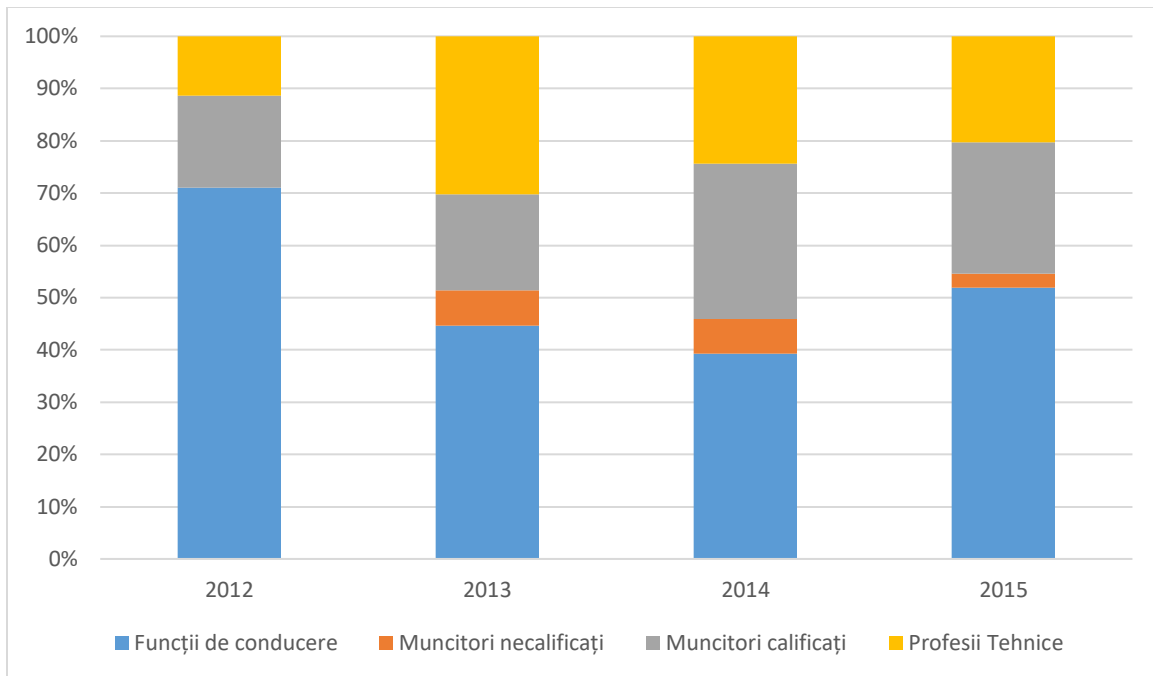


Fig 1.2 The distribution of newly formed enterprises during the period 2012-2015 based on the previous professional activity of the entrepreneur.

In Figure 1.2, we can observe a slight decline starting from the year 2012 regarding the tendency of individuals who have held leadership positions to start their own businesses. Additionally, individuals with qualifications maintain a consistent desire to start a business on their own

Chapter II: The Current State of the Business Environment in Romania, Auditing Non-Repayable Funded Businesses in the Context of Promoting DNSH Objectives

The current state of the business environment in Romania is in a continuous state of evolution and transformation, influenced by internal and external factors, including economic, political, and technological ones. In recent decades, Romania has sought to align itself with international economic trends, attract foreign investments, and develop key sectors for sustainable economic growth. In this context, the promotion of circular economy principles is becoming increasingly relevant.

The "Do No Significant Harm" principle (DNSH) is a new European-level obligation. According to European Regulations, all types of actions and/or investments proposed within funding programs are assessed based on their potential to cause significant harm to the six environmental objectives. The DNSH principle is defined in the Taxonomy Regulation, where Article 9 identifies the six environmental objectives, and Article 17 defines what constitutes significant harm for each of the six environmental objectives targeted by the Regulation:

1. Mitigation of climate change (GHG);
2. Adaptation to climate change;
3. Sustainable use and protection of water and marine resources;

4. Circular economy, including waste prevention and recycling;
5. Pollution prevention and control;
6. Protection and restoration of biodiversity and ecosystems.

Circular economy, one of the most important elements of the DNSH principle, represents a model of sustainable economic development in which resources are used efficiently, sustainably, and with minimal environmental impact. In this model, products are designed to be repaired, reused, recycled, or renewed, thus minimizing waste production and excessive consumption of natural resources. Promoting the circular economy involves transitions in production and consumption processes, as well as in business management approaches.

In the context of Romania, which faces challenges related to waste management and environmental impact, the circular economy presents a significant opportunity. The Romanian government and European organizations promote and support research and development projects that encourage the adoption of this model. Through non-repayable funds provided by the European Union and other sources, businesses can benefit from financial support to implement circular economy-oriented practices and technologies.

Auditing businesses financed by non-repayable funds in this context is essential to ensure compliance with circular economy objectives and financial requirements. Audits can assess how businesses use resources, produce, manage, and recycle products, promoting efficiency and sustainability at all these stages. By monitoring how businesses meet their circular economy-related objectives, it can be ensured that allocated funds are used properly, and the benefits are evident in terms of environmental protection and sustainable economic growth.

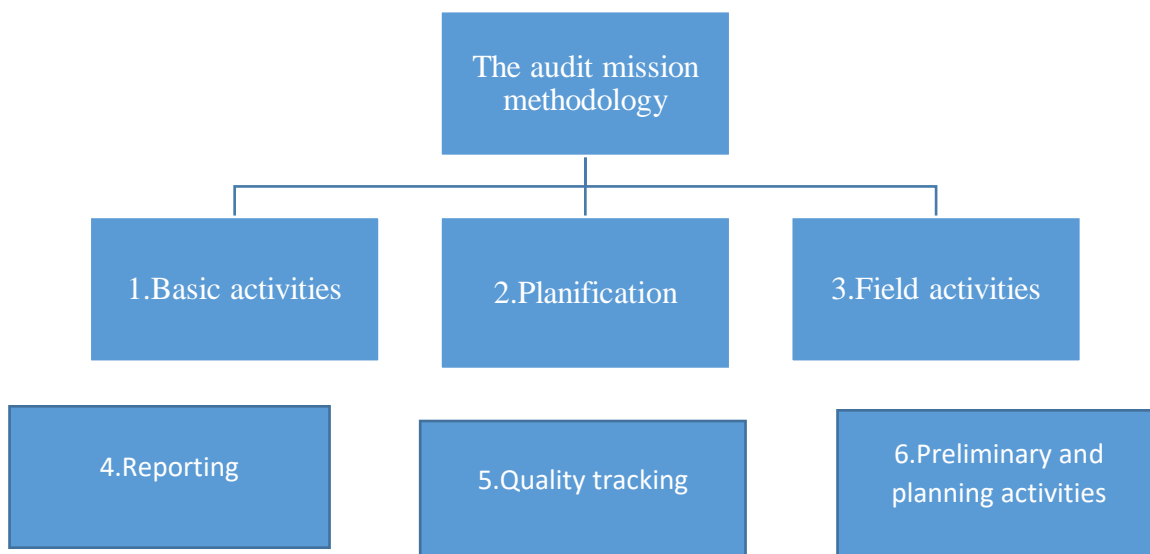


Fig II.1 The Audit Mission Methodology Diagram

In conclusion, the business environment in Romania is in the process of adapting to the principles of the circular economy, with the opportunity to benefit from non-repayable funds for projects that promote sustainability and resource efficiency. Auditing businesses funded by such funds plays a crucial role in monitoring and ensuring compliance with circular economy principles,

contributing to a gradual shift toward a more sustainable and environmentally responsible development model.

The establishment of a commercial company represents a complex but essential process for those wishing to start a business or develop an economic activity in a legal and structured manner. This initial stage involves fulfilling specific steps and formalities in accordance with the legislation of the country in which the company is to be established. Here are some important aspects related to this process:

Top of Form

Choosing the legal form: Depending on the objectives, needs, and size of the business, it is necessary to choose the appropriate legal form. The most common legal forms of commercial companies include limited liability company (SRL), joint-stock company (SA), sole proprietorship, general partnership (SNC), etc. The choice of the legal form depends on factors such as the partner's liability for the company's debts, share capital, company management, and others.

1. Defining the scope of activity: You must clearly define the scope of your company's activity. It can be related to production, trade, services, or a combination of these. Specifying the scope of activity is important to comply with specific legislation and legally conduct the chosen business activity.
2. Choosing the company name: Choosing an appropriate and legally available name is crucial. The name must be unique and not already registered by another entity.
3. Establishing the registered office: You need to choose a location as the registered office of the company. This is not necessarily the physical location where the business activity takes place but the address for receiving official documents and legal communications.
4. Determining shareholders and share capital: For limited liability companies (SRL) or joint-stock companies (SA), you need to determine shareholders and decide on the share capital.
5. Drafting the Articles of Incorporation: The Articles of Incorporation (founding document) is the main document that establishes the company's operating rules, organizational structure, rights and obligations of shareholders, and more. This document must be drawn up in the form of a contract and authenticated by a notary public.
6. Registering with the Trade Register: The Articles of Incorporation and other necessary documents must be submitted to the Trade Register for registration. After registration, the company will receive a registration certificate.
7. Obtaining the Unique Registration Code (CUI) and VAT code: To conduct economic activities, the company needs to obtain a Unique Registration Code (CUI) and, if applicable, a VAT code.
8. Approval by other authorities: Depending on the company's scope of activity, additional approvals or authorizations may be required from various authorities.
9. Actual commencement of activities: After completing all formalities, the company can effectively commence economic activities as specified in the Articles of Incorporation.

Establishing a commercial company involves strict adherence to the current laws and regulations to ensure the legality and long-term sustainability of the business. It is advisable to consult a commercial law specialist or an attorney to guide you through this process and ensure that all legal aspects are handled correctly and in accordance with local legislation.

Chapter III. STUDIES ON THE FINANCIAL SUSTAINABILITY OF SMEs FINANCED THROUGH REPAYABLE/NON-REPAYABLE EUROPEAN FUNDS AND THE POTENTIAL FOR RESEARCH INFRASTRUCTURE COOPERATION

In the context of the COVID-19 pandemic, the global economy has managed to withstand the challenges posed by the global health situation due to the cooperation and financial mobilization of the world's most influential and powerful international organizations and states. To

counteract the devastating effects that this pandemic has generated on the global economy, unimaginable material and financial resources have been mobilized. Unlike the previous crisis, where austerity measures were emphasized, massive concessions have been made in terms of state and corporate indebtedness in this case. Even in this context, due to the uncontrollable evolution of the pandemic, there is concern about the ability of states to sustain the fiscal and financial incentives provided to SMEs to support the economy.

Regarding Romania, the year 2021 is shadowed by a series of uncertainties that have generated a stagnation in the development of the Romanian business environment and, in some cases, a significant decrease in activity. These uncertainties stem from the three most important directions at the European level: internally, managing budget imbalances, and externally, the fiscal policy of the European Union and the evolution of Brexit.

The future budget of the EU-27 will cover seven areas of expenditure, providing the framework for funding nearly 40 spending programs over the next seven years. The €750 billion available to the member states for recovery is outlined schematically in Figure III.1.

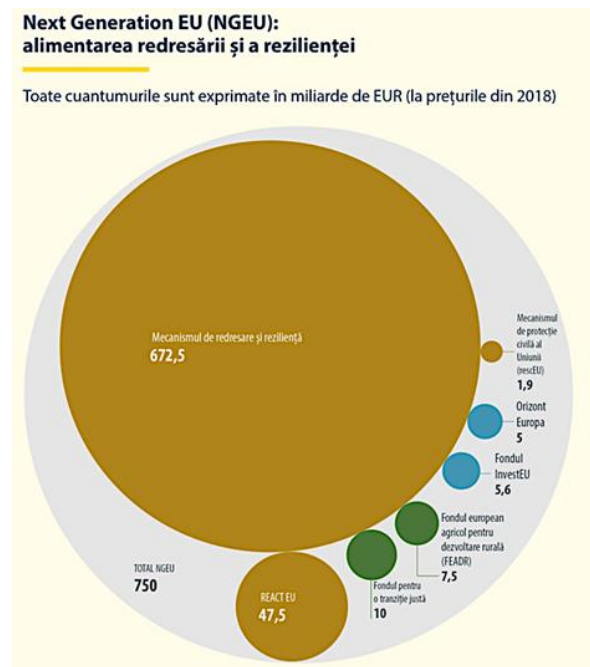


Fig. III.1. The financial allocation related to the Next Generation EU (NGEU) [6],[9]

The circular economy is a concept that promotes the efficient use of resources and waste reduction through sharing, reusing, repairing, refurbishing, and recycling existing materials and products. The goal is to extend the lifecycle of products and minimize their environmental impact.

By adopting this model, the aim is to reduce the consumption of raw materials, energy, and resources used in production, as well as minimize waste generation. This encourages the conservation of natural resources and the protection of the environment. By promoting circular economy practices, the goal is to create a more sustainable and economically resilient society.

Within the circular economy, the focus is on waste minimization through the preservation and reuse of materials. When a product reaches the end of its lifecycle, efforts are made to keep and reintroduce the materials it is composed of back into the economy as much as possible.

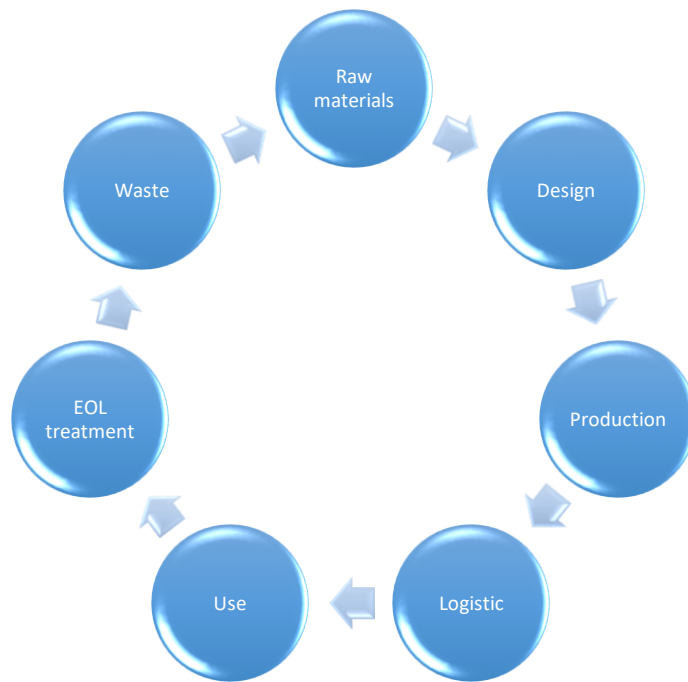


Fig III.2 Stages of a product's lifecycle

Taking into account these legislative aspects, in the case of SMEs, it is essential to consider the product lifecycle (Figure 2). Most economic actors focus their action plans on the first four stages, ignoring the last three stages. This will only lead to the identification of very few solutions that are in line with how the product is used, the processes associated with its end-of-life (EOL), and especially those related to its removal from the economic circuit in line with environmental protection objectives.

These materials can be reused or recycled in various processes, allowing them to create additional value and be used repeatedly. Therefore, the circular economy focuses on creating a system in which resources are used efficiently and sustainably, while waste is minimized.

The circular economy (and the principles that govern it - Figure III.3) represents a different approach compared to the traditional linear model of the economy, which is based on the concept of taking, making, consuming, and disposing. In contrast, the circular economy focuses on optimizing the use of resources and the lifecycle of products. This involves reducing dependence on new raw materials and energy by promoting the reuse, recycling, and refurbishment of existing materials and products. The goal is to achieve a more sustainable economy that minimizes its impact on the environment and maximizes the efficient use of available resources.

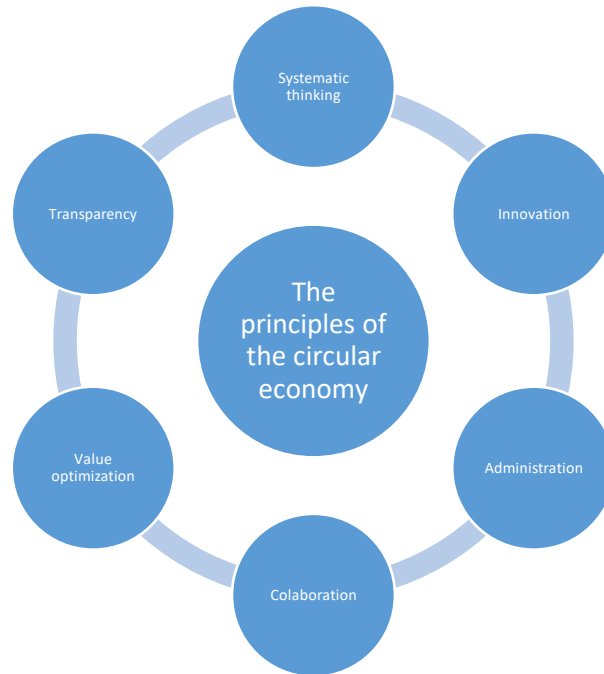


Fig III.3 The principles of the circular economy according to the BS:8001 standard [6], [9]

In addition to the approach of efficient resource utilization and product life cycles, the circular economy also addresses planned obsolescence. This involves intentionally designing products with a limited lifespan to encourage consumers to replace them with new products. This phenomenon is known as planned obsolescence and can have negative impacts on the environment and consumers. In this regard, the European Parliament has called for measures to combat this practice and promote durable, resilient, and easily repairable products. The goal is to encourage a shift toward a more sustainable consumption model and reduce the negative environmental impact by reducing waste and using resources more efficiently.

A concrete example is the company ALL3DWORKS, established and financed by non-refundable European funds in the period 2019 - 2020. The research carried out was based on the financial performances obtained in the context where the main field of activity is represented by 3D printing of medical prostheses. According to the financial results, the company experienced a decrease in profit in 2020 compared to 2019, with a value of (-23,206), representing a reduction in profit by 85 percentage points. This decrease was attributed to higher labor costs. After the pandemic period, the company began to show upward trends, and in 2021, the profit reached a level of 36,191 lei, marking a significant expansion of 786% compared to 2020. Between 2020 and 2021, the company developed a website for streamline customer access to its services. The positive impact of this platform became evident in 2022 when most orders were placed online, resulting in a profit of 451,976 lei, which means an exponential growth of 1149%.

With the goal of preventing climate change, the EU has adopted a series of objectives so that climate neutrality is achieved by 2050. Based on these politically assumed aspects at the European level, SMEs will be required to change their business perspectives. Thus, by 2030, reducing emissions will become a legally obligatory objective if the European Parliament and the Council reach a consensus on the European Climate Law. This law is a crucial part of the European Green Deal, which outlines the European Union's roadmap to climate neutrality. In

December 2020, a proposal was made to reduce emissions by 60% by 2030, compared to 1990 levels, and for European countries to achieve climate neutrality by 2050.

The concept of innovation is a synthesis of introducing something new. Throughout human existence, the search for and implementation of innovations have been key factors in the evolution of society. The importance and scope of these activities have increased with the development of society. Especially in recent decades, interest in innovation has seen phenomenal growth, as its role in achieving sustainable economic growth for both organizations and society is recognized. We are currently in a period of accelerated transition, characterized by complex and profound transformations in all areas of activity.

The fast demonstration of the acceptance and adoption of the mobile phone in people's everyday lives is a striking example of how innovation can quickly and profoundly change global lifestyles and culture. In a relatively short period of time, the mobile phone has become an indispensable tool for communication and access to information, transforming the way we interact and conduct our daily activities.

The case study presents the analysis of the economic and financial sustainability of 4 out of the 20 firms within the national startup program. The analysis aimed to determine sustainability indicators for the three levels within the firms, namely: • Exploitation level • Financial level • Activity profitability level

The 20 analyzed firms belong to different fields of activity, covering most of the sectors in the national economy, as presented in Table III.1.

Tabelul III.1 Centralizator firme [8]

Nume firmă	Cod CAEN	Domeniul de activitate
ALL SMART KEY SRL	2599	Manufacture of other metal articles n.e.c.
RENT MY SPORT CAR S.R.L.	7711	Rental and leasing activities of passenger cars and light road vehicles
CONTABILITATE CALARASI SRL	6920	Accounting and financial audit activities; tax consultancy
CONCEPT STING GRUP SRL	4329	Other installation works for constructions
S.C. FOTO VERDE PLUS SRL	7420	Photographic activities
THE SECRET GLOW S.R.L.	9602	Hairdressing and other beautification activities
RUSTIC KATERING SRL	5610	Restaurants
NICUȘOR SERV AUTO S.R.L.	7120	Testing activities and technical analyses
DAMAS SPACE CARE S.R.L.	8121	General building cleaning activities
S.C. ADVENTURE TEAM SRL	7711	Rental and leasing activities of passenger cars and light road vehicles
APULUM CONSULTANCY SRL	7490	Other professional, scientific and technical activities n.e.c.

AUTOMOTOBIKE SRL	4520	Maintaining and repairing vehicles
CABINET RESURSE UMANE REVIS FLUX CONT SRL	7830	Other labor supply services
CSOZO DIAGNOSTIC SRL	4520	Maintaining and repairing vehicles
S.C. ELECTRO TECHNICAL SOLUTIONS S.R.L	4321	Electrical works
KUNAFKA KATAIF ARABIC SWEETS SRL	1071	Bread making; manufacture of cakes and fresh pastry products
MC TERASARE SRL	4312	Electrical works
MOBAUTOTECH S.R.L.	4520	Maintaining and repairing vehicles
SMART SIB CONSTRUCT SRL	4333	Flooring and wall cladding works
IDEAL DESIGN EVENTS SRL	9329	Other recreational and fun activities n c a

Out of the 20 companies studied, only 4 demonstrate indicators that lead us toward financial sustainability. Based on the three levels within the analyzed companies, the following indicators have been determined:

- At the operational level: fixed asset turnover, current asset turnover, inventory turnover, accounts receivable turnover, cash turnover.
- At the financial level: financial stability ratio, current funding ratio, overall financial autonomy, overall autonomy index, long-term financial autonomy, overall debt ratio, overall debt index.
- At the profitability level: economic profitability, financial profitability, expense profitability, revenue profitability.

Following the analysis of these indicators at the three levels, the most sustainable companies out of the 20 analyzed are: ALL SMART KEY SRL, AUTOMOTOBIKE SRL, S.C. ELECTRO TECHNICAL SOLUTIONS S.R.L, SMART SIB CONSTRUCT SRL due to their high efficiency and profitability in their operations.

Bringing together all the information and data presented earlier, it is important to generate a minimal calculation formula through which programmatic documents can be developed to address the development needs of SMEs and support research infrastructure in generating innovation and added value by having business support the expenses. The formula should include:

- The budget allocated for a programming period for funding a specific sector.
- The number of potential beneficiaries of the funds in order to achieve program objectives.
- The operating costs that the research infrastructure incurs during the programming period.

One possible way to formulate this calculation could be:

Total Funding = (Budget Allocated / Number of Potential Beneficiaries) + Operating Costs

This formula takes into account both the budget allocated for a specific sector and the number of potential beneficiaries, distributing the budget equitably among them. It also considers the necessary operating costs incurred by research infrastructure during the programming period. This way, it helps in efficiently allocating funds to support SMEs and research infrastructure to drive innovation and added value.

Mathematical Models: Taking the example of "RONAVEC," the research infrastructure dedicated to SMEs operating in the agricultural sector and the National Rural Development Program (PNDR) for the period 2015 - 2020, we have defined the following elements that lead us to obtain the necessary calculation formula:

- The number of beneficiaries funded during the period 2015 - 2020.
- Operating costs of the research infrastructure over a 5-year period.
- The potential impact of the operating costs of a research infrastructure on the total payments made to beneficiaries during the period 2015 - 2020.
- The average funding received by each beneficiary during the period 2015 - 2020.

The potential impact of the operating costs of a research infrastructure on the total payments made to beneficiaries, symbolized as ICOP, is calculated using the relationship (1):

(ICOP) = (Operating Costs / Total Payments to Beneficiaries in 2015 - 2020)

$$ICOP = \frac{CIC}{FA} \% \quad (1)$$

Where:

- CIC represents the Operating Costs of the research infrastructure.
- FA represents the Non-Reimbursable Funding provided to beneficiaries.

In this case, we have the following data:

CIC = 2.937.000 EURO [um- EURO]

FA = 1.400.000.000 EURO [um - EURO]

Thus, applying formula (1), we obtain the value of ICOP = 0.21%.

The average funding received per beneficiary, symbolized as [um], is calculated using formula (2):

$$VM_B = \frac{FA}{BF} \text{ [um - EURO]} \quad (2)$$

Where:

- FA represents the Non-Reimbursable Funding provided to beneficiaries [um].
- BF represents the Number of funded beneficiaries.

In the analyzed case, the values of the indicators mentioned in formula 2 are:

- FA = 1.400.000.000 EURO [um]
- BF = 27.000
 - Applying formula 2 yields: $VM_B = 51,851.85$ EURO [um].
 - The budget allocated to the research infrastructure is calculated using one of the relationships.

[3], [4], [5]:

$$BAIC = VM_B \cdot ICOP \text{ [um – EURO]} \quad (3)$$

$$BAIC = VM_B \cdot \frac{CIC}{FA} \text{ [um – EURO]} \quad (4)$$

$$BAIC = \frac{FA}{BF} \cdot \frac{CIC}{FA} \text{ [um – EURO]} \quad (5)$$

In the analyzed case, the values of the indicators mentioned in formulas [3], [4], [5], are as follows:

- $VM_B = 51,851.85$ EURO [um]
- ICOP=0.21%
- CIC=2,937,000 EURO [um]
- FA=1,400,000,000 EURO [um]

Applying the above formulas, we obtain the budget allocated to the research infrastructure for the investigated case:

$$BAIC = \frac{CIC}{BF} = 108,78 \text{ EURO [um – EURO]} \quad (6)$$

Chapter IV: QUANTITATIVE AND FINANCIAL STATISTICAL ANALYSIS REGARDING THE IMPACT OF EUROPEAN FUNDS AMONG 198 BENEFICIARIES

A quantitative and financial statistical analysis of the impact of European funds on 198 beneficiaries represents a complex and detailed investigation aimed at evaluating the effects and outcomes achieved as a result of the absorption of these funds in a specific context or field. This analysis can provide a profound understanding of how European investments have influenced the beneficiaries, the economy, and long-term development.

Here is how such an analysis can be developed:

1. **Beneficiary Selection:** Before commencing the analysis, a representative sample of 198 beneficiaries who have received European funds must be chosen. These beneficiaries can be small and medium-sized enterprises, non-profit organizations, public or private institutions, etc.
2. **Data Collection:** Data related to the total amount of European funds received by each beneficiary, the project implementation period, the field of activity, geographical region,

etc., are collected. Additionally, relevant financial data such as revenues, expenses, profits, number of employees, both before and after the implementation of funded projects, should be gathered.

3. **Definition of Impact Indicators:** Relevant impact indicators that assess how European funds have influenced the beneficiaries are defined. These indicators may include income growth, creation of new jobs, export growth, infrastructure improvement, innovation, etc.
4. **Quantitative Analysis:** Statistical analyses will be conducted to identify trends and relationships among the variables under study. For instance, regression analyses can be performed to determine if there is a correlation between the amount of European funds received and income growth.
5. **Financial Analysis:** A detailed analysis of the financial situations of the beneficiaries before and after the implementation of funded projects will be carried out. This may include analyses of profitability ratios, cash flows, expenses, and profitability.
6. **Comparative Analysis:** By comparing data before and after the implementation of funded projects, assess the changes and the impact brought by these funds on the beneficiaries. Trends and patterns that indicate success or challenges encountered can be identified.
7. **Interpretation of Results:** The results obtained from the analyses will be interpreted, highlighting strengths and weaknesses, as well as the positive and negative effects of European funds on the beneficiaries and the overall economy.
8. **Development of Conclusions and Recommendations:** In the end, based on the conducted analysis, conclusions regarding the impact of European funds will be elaborated, and recommendations will be formulated to optimize their future use for maximizing benefits. A detailed quantitative and financial statistical analysis can provide essential data for decision-makers, the development of public policies, and the improvement of investment strategies. It can clearly reveal how European funds have contributed to the development of the economy and the involved beneficiaries.
9. **Continuing the quantitative and financial statistical analysis of the impact of European funds among 198 beneficiaries** involves exploring various aspects related to the absorption and utilization of these funds. Here's how this continuation can be developed:
10. **Data Segmentation:** To gain a deeper understanding, data can be segmented based on certain criteria, such as the field of activity, beneficiary size, geographic region, etc. This can reveal significant variations in the impact of funds based on beneficiary characteristics.
11. **Social Impact Assessment:** In addition to economic impact, an assessment of the social impact of European funds can be conducted. This may include increased access to education, improved quality of life, reduction in unemployment, and more.
12. **Cost-Benefit Analysis:** A detailed analysis of the costs and benefits associated with projects funded by European funds can be performed. This aspect can clarify whether the benefits brought by the projects exceed the investments made.
13. **Long-Term Effects:** The impact of European funds can be examined over a longer time horizon to determine if positive results are durable and sustainable in the long run.
14. **Comparison with Control Group:** To measure the real impact of European funds, a control group consisting of similar entities that did not receive European funding can be created. This allows for the comparison of results between the two groups.
15. **Synergy Analysis:** Synergies between funded projects can be identified to evaluate the collective impact of European funds on a specific sector or region.
16. **Feedback from Beneficiaries:** Interviews and surveys with beneficiaries can provide valuable information about the perceived impact of European funds on their activities.
17. **Analysis of Effects Spillover:** An evaluation can be conducted to determine if the positive impact of European funds spreads throughout the community by creating new business opportunities or development in the area.

18. Visual Presentation: Using charts and diagrams can make data more accessible and easier to understand for decision-makers and the general public.
19. Scenario Development: Alternative scenarios can be developed to evaluate what would have happened in the absence of European funds and to compare with the current situation.
20. Identification of Challenges and Lessons Learned: The analysis can reveal challenges and obstacles encountered during project implementation, as well as lessons learned for future funded projects.
21. Compilation of the Final Report: The analysis will be synthesized into a comprehensive final report that includes all relevant findings, conclusions, and recommendations.

By developing this ongoing analysis, a comprehensive and detailed picture of how European funds have influenced beneficiaries and the business environment as a whole is obtained. This provides essential information for decision-makers and contributes to the improvement of future strategies for the use of European funds.

There is a variety of programs and tools available for processing and analyzing statistical data, whether it's quantitative or qualitative analysis. The choice of the right program depends on the nature of the data and the specific requirements of the analysis. Here are some popular programs for statistical data processing:

1. Microsoft Excel: Excel is a common tool for data analysis and creating tables and charts. It is user-friendly and offers functions for calculations, filtering, sorting, and creating visualizations.
2. SPSS (Statistical Package for the Social Sciences): SPSS is specialized software for statistical data analysis, primarily used for quantitative data analysis. It provides a wide range of functions and statistical methods for data analysis.
3. R: R is a programming language and development environment for statistical analysis and graphics. It is free and open-source, with an active community that develops packages for various statistical analyses.
4. Python: Python is another programming language used for data analysis, with libraries such as Pandas and NumPy that are powerful in data manipulation and analysis.
5. STATA: STATA is another program for statistical analysis, offering complex functionalities for both quantitative and qualitative data analysis.
6. SAS: SAS is specialized software for statistical data analysis and data mining, commonly used in business and research settings.
7. Tableau: Tableau is a data visualization tool that allows the creation of interactive charts and dashboards to facilitate data interpretation.
8. QGIS: If you have geospatial data, QGIS is an open-source program for spatial data analysis and visualization.
9. NVivo: NVivo is used for qualitative data analysis, such as interviews or text content, helping to find patterns and trends in complex information.
10. MATLAB: MATLAB is primarily used for advanced mathematical and statistical analysis, suitable for scientific research and engineering.
11. JMP: This is data analysis and exploration software developed by SAS.

The choice of software depends on your level of experience, the type of analysis you want to perform, and personal preferences. Many of these programs offer free versions or trial periods, so you can experiment to find the one that suits your needs best.

Statistical Package for the Social Sciences (SPSS) is one of the most widely used and recognized statistical analysis programs in social research, behavioral sciences, economics, and other fields where data analysis is crucial. SPSS is developed by IBM and offers a wide range of features for data manipulation, analysis, and interpretation of quantitative data.

Here are some important aspects about SPSS:

1. **User-Friendly Interface:** SPSS has an intuitive interface with user-friendly menus and visual tools. This makes the program suitable for both experienced data analysts and beginners.
2. **Data Manipulation:** SPSS allows data import and export from various sources, including Excel. You can organize and clean data through filtering, sorting, and handling missing data.
3. **Descriptive Analysis:** SPSS provides tools for calculating descriptive statistics such as mean, median, standard deviation, distribution, and frequencies.
4. **Inferential Analysis:** SPSS enables the use of statistical tests to analyze relationships between variables, such as t-tests for two samples, analysis of variance (ANOVA), linear regression, and many others.
5. **Chart Creation:** The program provides options for creating charts and visualizations, such as histograms, bar charts, line graphs, box plots, and more.
6. **Advanced Analysis:** SPSS is capable of performing more complex statistical analyses, such as factor analysis, cluster analysis, correspondence analysis, and multivariate analysis.
7. **Programming:** For more advanced users, SPSS allows the writing and execution of syntax for more complex and customized analyses.
8. **Reporting Results:** SPSS offers options for automatically generating reports and presentations of analysis results.
9. **Extensions and Modules:** SPSS allows users to extend its functionality by adding specialized modules, such as text analysis or geospatial analysis modules.

SPSS is used in research, education, and business for making informed decisions based on data analysis. While it was initially developed for social data analysis, SPSS is now used in a wide range of fields and has an active user community and learning resources.

All of these analyses and research efforts have contributed to the visualization of three key elements in Romania's existing economic machinery:

1. Diagram of non-repayable European Union funding cycles (for startups).
2. Concept of a legal entity that could be established to align with and achieve the objectives set by the "DNSH" at the European level.
3. Diagram illustrating the structure of business plans by categories of legal entities that can be supported.

Table IV.3 Motivation for becoming an entrepreneur through the StartUP Plus/Diaspora program

		Frequency	Percent/ Relative frequency	Valid Percent/ Valid percentage frequency	Cumulativ e Percent/
Valid	I took advantage of the free funding to put an idea into practice of business in which I believe	69	34,8	34,8	34,8

I thought that this program was a good opportunity for a start in business for those who have never had experiences of this type before	40	20,2	20,2	55,1
I had been thinking about taking the step towards entrepreneurship for a long time, but I wasn't willing to risk my own money	26	13,1	13,1	68,2
I was thinking for a long time to take the step towards entrepreneurship, but I had no money	28	14,1	14,1	82,3
A real chance to start a business that will become an additional motivation not to leave the country	17	8,6	8,6	90,9
A real chance to start a business that will become an additional motivation to return to the country	14	7,1	7,1	98,0
I wanted to try to see how the funds are accessed and what it's like to be entrepreneur	1	0,5	0,5	98,5
A friend convinced me to file together	1	0,5	0,5	99,0
I didn't trust such funding and wanted to test it myself	1	0,5	0,5	99,5
Free funding to try to make a business.	1	0,5	0,5	100,0
Total	198	100,0	100,0	

According to one-third of the respondents, the main motivation for becoming an entrepreneur through the StartUp Plus/Diaspora program is both internal and financial. Specifically, 34.8% stated that they took advantage of the free funding to put their business idea into practice, which they believe in. 20.2% noted that they were attracted to the opportunity provided for individuals who had no previous experience in business management, while 14.1% were explicitly motivated by the financial aspect offered.

The table and histogram below present measures of central tendency and dispersion. In terms of measuring central tendency, we can observe that the mean value is 2.619, and the mode has a value of 1.000. This indicates that the highest frequency of responses belongs to respondents who "took advantage of the free funding to put their business idea into practice, which they believe in."

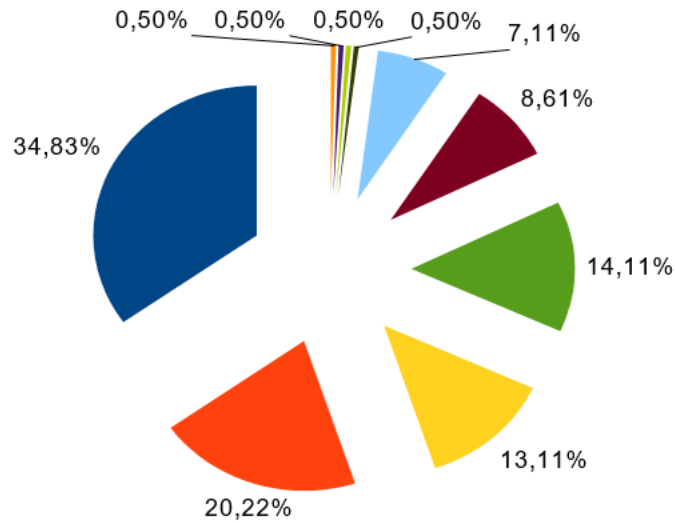


Fig IV.19 Motivation diagram for becoming an entrepreneur through the StartUP Plus/Diaspora program

- I took advantage of the free funding to put my business idea into practice, which I believe in.
- I considered that this program was a good opportunity for those who had no previous experience of this kind to start a business.
- I had been thinking about taking the step into entrepreneurship for a long time, but I wasn't willing to risk my own money.
- I had been thinking about taking the step towards entrepreneurship for a long time, but I didn't have the money.
- A real opportunity to start a business that could become an extra motivation not to leave the country.
- A real opportunity to start a business that could serve as an additional motivation to return to the country.
- I wanted to try and see how to access the funds and what it's like to be an entrepreneur.
- A friend convinced me to apply together.
- I didn't have confidence in such funding, and I wanted to test it on my own.
- Free funding to try and start a business.

Statistics		
1) Vă rugăm să alegeți din variantele de mai jos care a fost principala dvs. motivatie pentru a deveni antreprenor prin programul StartUP Plus/Diaspora?		
N	Valid	194,000
	Missing	4,000
Mean		2,619
Std. Error of Mean		,117
Median		2,000
Mode		1,000
Std. Deviation		1,625
Variance		2,641
Skewness		,664
Std. Error of Skewness		,175
Kurtosis		-,780
Std. Error of Kurtosis		,347
Range		5,000
Minimum		1,000
Maximum		6,000
Sum		508,000
Percentiles	25	1,000
	50	2,000
	75	4,000

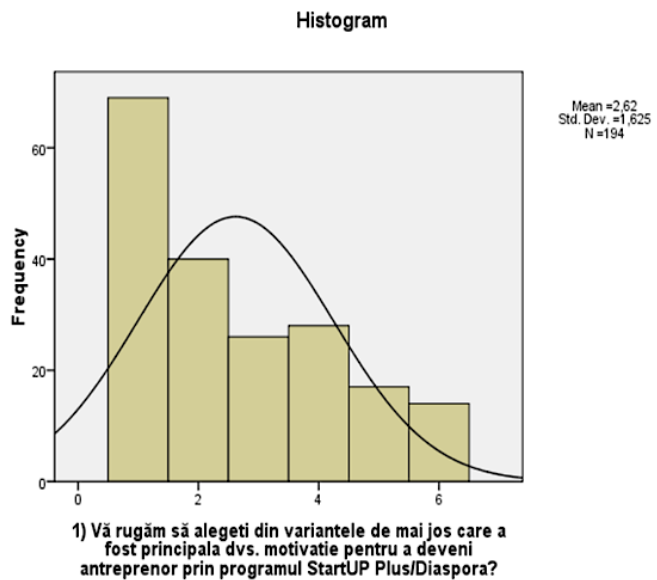


Fig IV.20 Histogram of motivation for becoming an entrepreneur through the StartUP Plus/Diaspora program

Table IV.18 Personnel Handling the Business

	Frequency	Percent/	Valid Percent/	Cumulative
	Frecvență	Frecvență	Valid Percent/	Percent/
	absolută	relativă	Frecvență	Procente
			procentuală	
			validă	cumulate
Valid	YES, I personally manage it as an ADMINISTRATOR, without being an employee.			
	61	30,8	30,8	30,8

YES, I personally manage it while also being an employee of the company.	132	66,7	66,7	97,5
NO, I have hired someone to manage the business operations.				
Total	198	100,0	100,0	

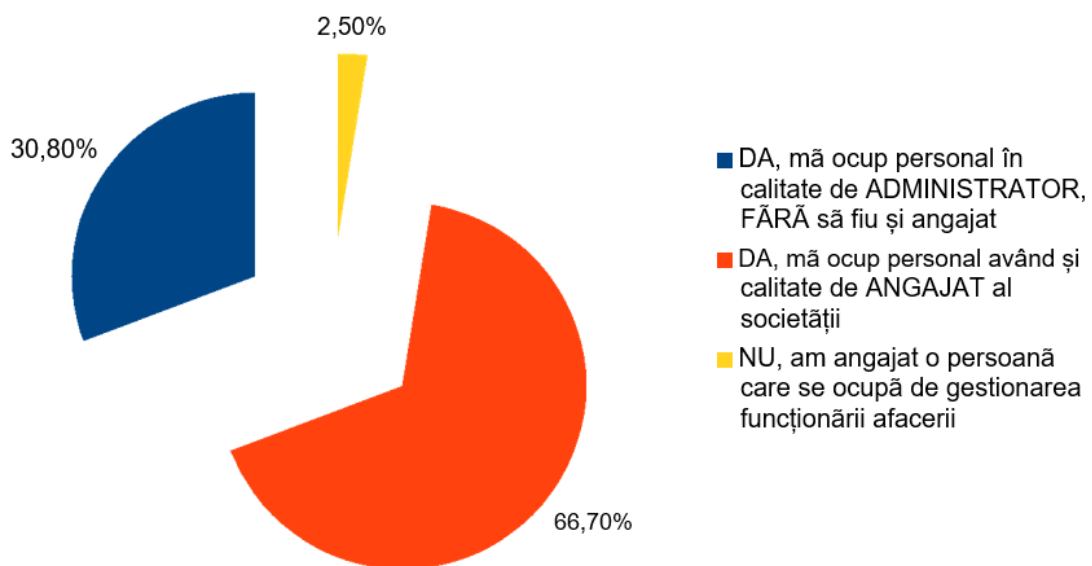


Fig IV.50 Diagram of the personnel responsible for the business

Statistics		
6) Vă ocupați personal de afacerea dvs. sau ați angajat o persoană în acest sens?		
N	Valid	198,000
	Missing	,000
Mean		1,717
Std. Error of Mean		,036
Median		2,000
Mode		2,000
Std. Deviation		,505
Variance		,255
Skewness		-,358
Std. Error of Skewness		,173
Kurtosis		-,583
Std. Error of Kurtosis		,344
Range		2,000
Minimum		1,000
Maximum		3,000
Sum		340,000
Percentiles	25	1,000
	50	2,000
	75	2,000

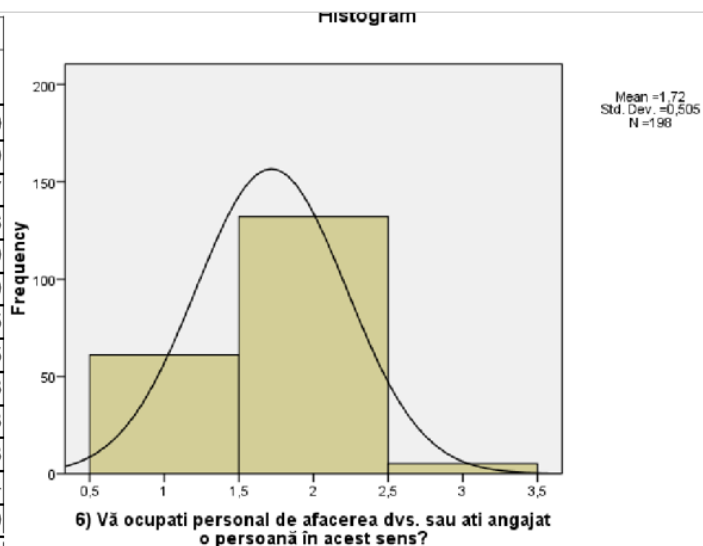


Fig IV.51 Histogram of the personnel responsible for the business

According to the information obtained through the survey, 30.8% of respondents personally manage the business as administrators without being employees of it. A percentage of 66.7% stated that "I personally manage it as an employee of the company," while 2.5% have hired someone to manage the business.

Chapter V. GENERAL CONCLUSIONS, RECOMMENDATIONS, AND FUTURE RESEARCH DIRECTIONS

This chapter synthesizes the most important aspects studied in the field of entrepreneurship and the management of start-ups funded through non-reimbursable European funds. To strengthen the qualitative and quantitative research conducted so far, I have managed to establish a series of links between the results obtained after completing the study conducted on a sample of 198 start-ups funded through non-reimbursable European funds under the Start-up Plus and Start-up Diaspora calls, in the period 2019 - 2021.

As a result of completing the study, we obtained a series of variables based on the structured questionnaire applied to the 198 entrepreneurs, which provide us with a fairly comprehensive picture of the entrepreneurial field and the funding conditions for entrepreneurs. During the observation phase, we identified several independent variables that we analyzed separately from the other results obtained. Starting from these independent variables, analyzed at the study level as a whole, we raised several questions, such as: among these independent variables obtained as a result of the questionnaire, is there any connection? How strong is the connection, and how could the results change if one or more variables were to change?

To formulate coherent answers to these types of questions, I used SPSS to obtain data that could be analyzed using interdependent series. Among the elements I considered and which can be modified to produce beneficial changes in the efficient use of funds for entrepreneurs, I mention: the level of education, the financial results obtained by the funded companies during the

funding period, the region and county where the business is implemented, the sector in which the business operates, the salary level outlined in the business plan, and the financial situation of the company after completing the business plan implementation.

Taking into account empirical data, in practice, we can encounter the following situations:

1. An independent variable A causes a change in the dependent variable B, in which case there is a univocal relationship between the two variables.
2. There is a reciprocal relationship between the two variables.
3. The variables have a similar evolution, determined by another variable that simultaneously influences the change in both variables.
4. The variables evolve similarly (by chance), without a connection between them.

Considering the situations mentioned above, a classification has been made, taking into account a series of criteria, such as:

a) Based on the nature of interdependence relationships: functional relationships and statistical relationships.

b) Based on the number of factorial variables considered: simple relationships and multiple relationships.

c) Based on the nature of the characteristics: associative relationships and correlation relationships.

d) Based on the direction of the relationship: direct relationships and inverse relationships.

e) Based on the analytical expression of the relationship/function form: linear relationships and nonlinear relationships.

f) Based on the timing of the relationship: synchronous relationships and asynchronous relationships.

In my effort to conduct this impact study, I approached three pillars from 2020 to 2022, which led us to a series of conclusions regarding the economic and financial sustainability of startups and their contribution to achieving goals related to sustainable development, transitioning to a circular economy, and the concept of R&D (research, development, and innovation).

1. Risk Management and Financial Sustainability of Startups Funded through POCU 2014-2020;
2. Performance of Startups Funded through POCU 2014-2020 in the Context of Transitioning to a Circular Economy.
3. Access of Entrepreneurs Funded by Non-Refundable European Funds to Research Infrastructures. This approach led us to a series of relevant information and conclusions published in specialized journals and at international conferences, which served as a starting point for the present study.

In terms of risk management and financial sustainability, the conclusions are more than concerning. Analyzing the documentation (62 business plans and related budgets), combined with a series of questionnaires applied to 62 firms funded through this mechanism (POCU 2014-2022), we find that the success rate of startups and their sustainability is influenced by the lack of financial and technical preparedness of entrepreneurs. Thus, from the analyzed sample, only 2

out of 10 firms exhibit indicators that lead to financial sustainability, including the following indicators:

- At the operational level: fixed asset turnover, current asset turnover, inventory turnover, accounts receivable turnover, cash turnover.
- At the financial level: financial stability ratio, current ratio, global financial autonomy, global autonomy index, short-term financial autonomy, overall debt ratio, global debt index.
- At the profitability level: economic profitability, financial profitability, expense profitability, revenue profitability.

In the context of the principles advocated by specialists for the transition from a traditional economy to a circular economy centered around environmental protection, recycling, low emissions, and sustainable development, analyzing the same 62 startups (later increased by 15% to 72 startups to verify if the results obtained on the initial sample are maintained), we have found that we cannot speak of the real sustainability of startups or the transition to a circular economy. This is because the only mandatory elements that funded startups need to fulfill are largely related to: preserving the jobs created, acquiring new machinery/equipment, avoiding bankruptcy, insolvency, or the deliberate closure of a startup within five years of receiving funding, as well as avoiding the disposal of purchased assets or changing their intended use.

Regarding the third pillar, which is access to research infrastructure and/or innovation clusters necessary for achieving synergy between the economic sustainability of the state and businesses and the environment, we used the information collected from startups funded through POCU, managed by the Ministry of Investments and European Projects through the Managing Authority, for the period 2018-2019, and information related to project calls within the National Rural Development Program (PNDR) (calls aimed at entrepreneurs/the private sector), managed by the Ministry of Agriculture and Rural Development through AFIR. Thus, in the period 2015-2020, we observed that only 0.56% of the total of over 1.4 billion euros allocated to private beneficiaries for establishing and/or expanding agricultural activities was allocated to creating partnerships between financing beneficiaries and research infrastructures/innovation clusters in order to generate added value in this field. Based on this aspect, we have developed a mathematical model to serve as the basis for future research so that central public authorities can formulate budgets for programming periods and project call documentation, taking into account the National Strategy for Research, Development, and Innovation, existing research infrastructures, and the business environment's research and innovation needs.

Taking all this information into account, we can conclude that we cannot discuss real sustainability, real sustainable development, or real research, development, and innovation. To achieve these goals, in-depth studies are needed, both quantitative and qualitative, on increasingly larger samples, in such a way that the startup financing system can be shaped.

Compiling the results presented earlier through an analysis of all the items, we obtain a series of information that we present as a set of conclusions:

Conclusion 1. Most entrepreneurs who have accessed this type of funding program do NOT strictly aim for the development of a sustainable business but rather aim to obtain non-repayable funding to test certain business ideas without risking their own money.

Conclusion 2. The funding program has primarily served as a source of income for most, with the main goal being to allocate substantial amounts from the business plan budget to cover personal salary expenses. Over 60% of those who planned salaries ranging from 2200 to 5500 RON and over 5500 RON also hired themselves within their own companies, compared to a percentage of less than 4% among those who planned salaries within the same brackets but hired

specialized personnel to carry out the company's economic activities. Additionally, the highest salaries outlined in the business plans, exceeding 5500 RON, are found in the Services sector.

Conclusion 3. Analyzing the respondents' level of education in comparison to their motivation to become entrepreneurs, we can conclude that over 60% of those with university degrees accessed this funding for two reasons: they took advantage of the fact that the funding was 100% non-repayable and were not willing to risk their own money to start a business. Conversely, over 23% of those with technical (professional) qualifications saw this funding as a first step in establishing a business in the field they had learned.

1. The results obtained in this study can serve as the basis for complex analyses of funding programs aimed at young entrepreneurs, as they provide an important perspective on the management and entrepreneurship financed by non-refundable European funds in Romania.
2. Based on the results obtained, three research directions should be considered:
 - A comprehensive analysis of programs that fund entrepreneurs establishing start-ups, in order to obtain a complete picture of the real impact of such non-refundable funds on both entrepreneurship and the real economy of Romania (e.g., Ex-Post analysis).
 - Diagnosis of the funding system for these types of programs, starting from the conditions for granting non-refundable funds to the actual sustainability of funded start-ups.
 - Establishment of a new reference and control system for start-ups funded by non-refundable European funds, starting from the DNSH principle and the innovative business model developed by the author in this thesis.
3. According to the data obtained, several proposals are necessary to improve the quality of entrepreneurship and management of start-ups funded through 100% non-refundable European funds:
 - ✓ Eliminate artificial conditions such as the number of employees and turnover that must be achieved after implementing a business plan within 12-24 months. During this period, companies do not reach full maturity but rather operate due to the inertia of funding.
 - ✓ Cap the level of salaries that entrepreneurs can budget in their non-refundable European funds business plan to avoid accessing these funds solely because they can cover very high salaries.
 - ✓ Eliminate conditions requiring the mandatory hiring of personnel for a defined period during the implementation of the business plan to avoid hiring personnel when the company is not yet operational (lacks the necessary permits, equipment, etc.).
 - ✓ Apply financial corrections to entrepreneurs in proportion to the sustainability conditions they have committed to. For example, if two jobs must be maintained for a sustainability period of 6 months and, for various justifiable reasons (e.g., pandemic, declining industry sector, increased raw material prices or operating costs, inability to find qualified personnel for a specific field, etc.), one month out of the 6 cannot maintain those jobs, the financial correction should be proportional rather than a 100% burden on the start-up, as this would lead to its closure through such decisions.
 - ✓ Remove conditions regarding the purchase of new equipment (based on well-justified business plan considerations) to achieve sustainable development goals or the circular economy objectives mandated at the European level, even if this implies occasional changes to European Commission regulations (e.g., acquiring 2 used machines instead of a new one based on a technical-economic benefit analysis for the company).
 - ✓ Introduce mandatory criteria related to meeting the directions outlined in national and European strategies. For example, in the research sector, most research infrastructures primarily operate on state budget funds and less from their own revenue, such as selling trademarks, patents, licenses, technical solutions, equipment, products, etc. Given this example, one criterion could be the mandatory requirement for a future start-up to purchase specific services or products from a research institute in the field of activity in

which they operate, amounting to at least 2-3% of the total funding received by the start-up.

- ✓ Develop the calculation formulas resulting from this thesis for application in most economic sectors in Romania.
- ✓ Develop and model the proposed business plan and legal entity, and transpose them into national legislation.

Conclusion 4. Taking into account the parameters under which the company operates after implementing the business plan and the age of the entrepreneurs, we find that most businesses are functional among individuals aged between 18 and 35, while as entrepreneurs age, more companies tend to become non-functional or even inactive after the completion of the budget related to the business plan.

Conclusion 5: The introduction of a new legal entity concept (Green Start-up Concept) is necessary. This concept should receive non-repayable funding and be used as a starting point for launching a business that incorporates the DNSH principle directly into the entity's status.

In this regard, I have developed three complex diagrams to provide a comprehensive overview of the following three important aspects:

1. How start-ups are funded (process).
2. What a business plan looks like for legal entities similar to start-ups funded by non-repayable funds.
3. An innovative model of a legal entity that could be funded through non-repayable funds - GSC (Green Start-up Concept).

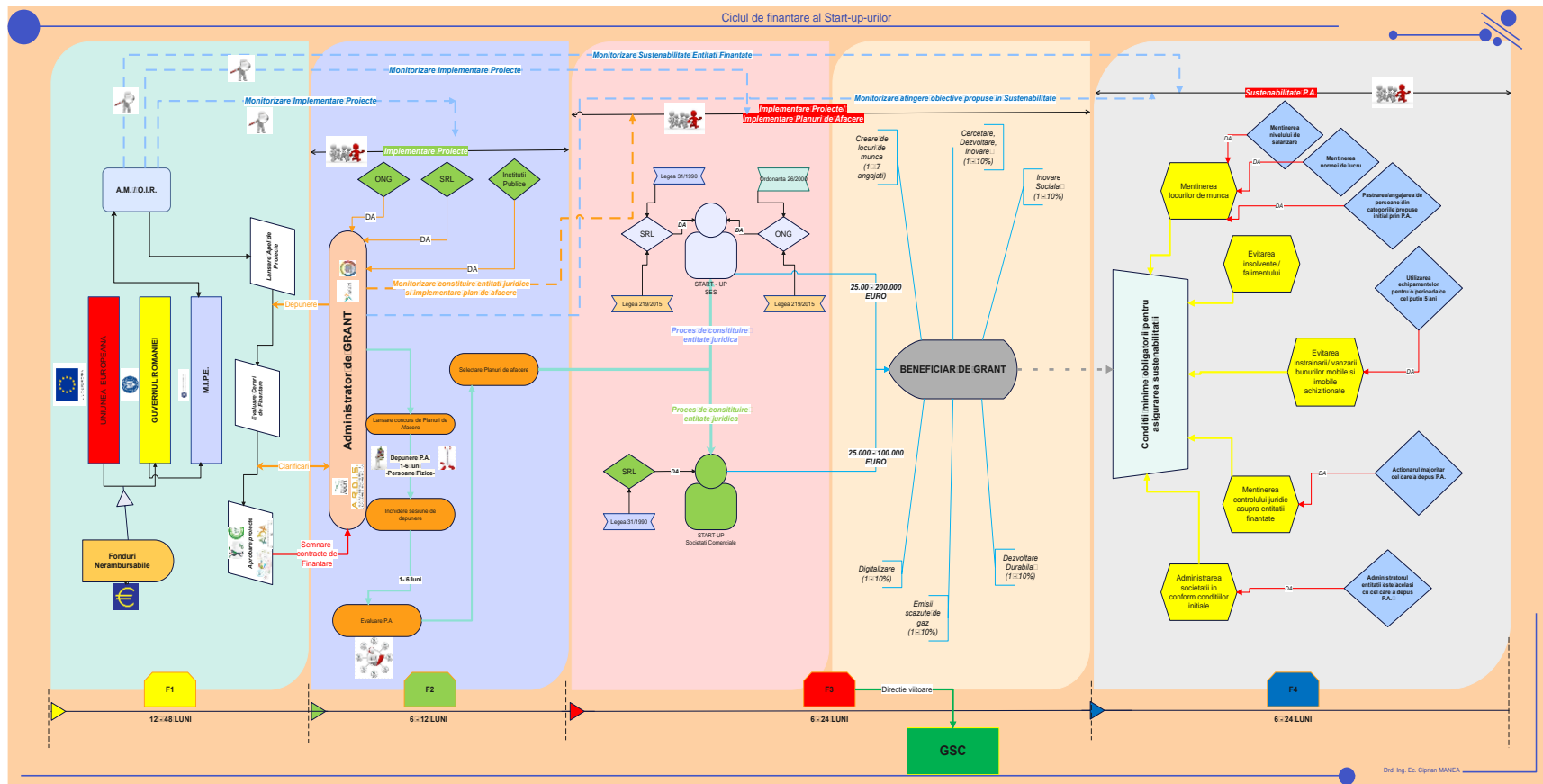


Diagram 1: The Funding Cycle of Start-ups in Romania

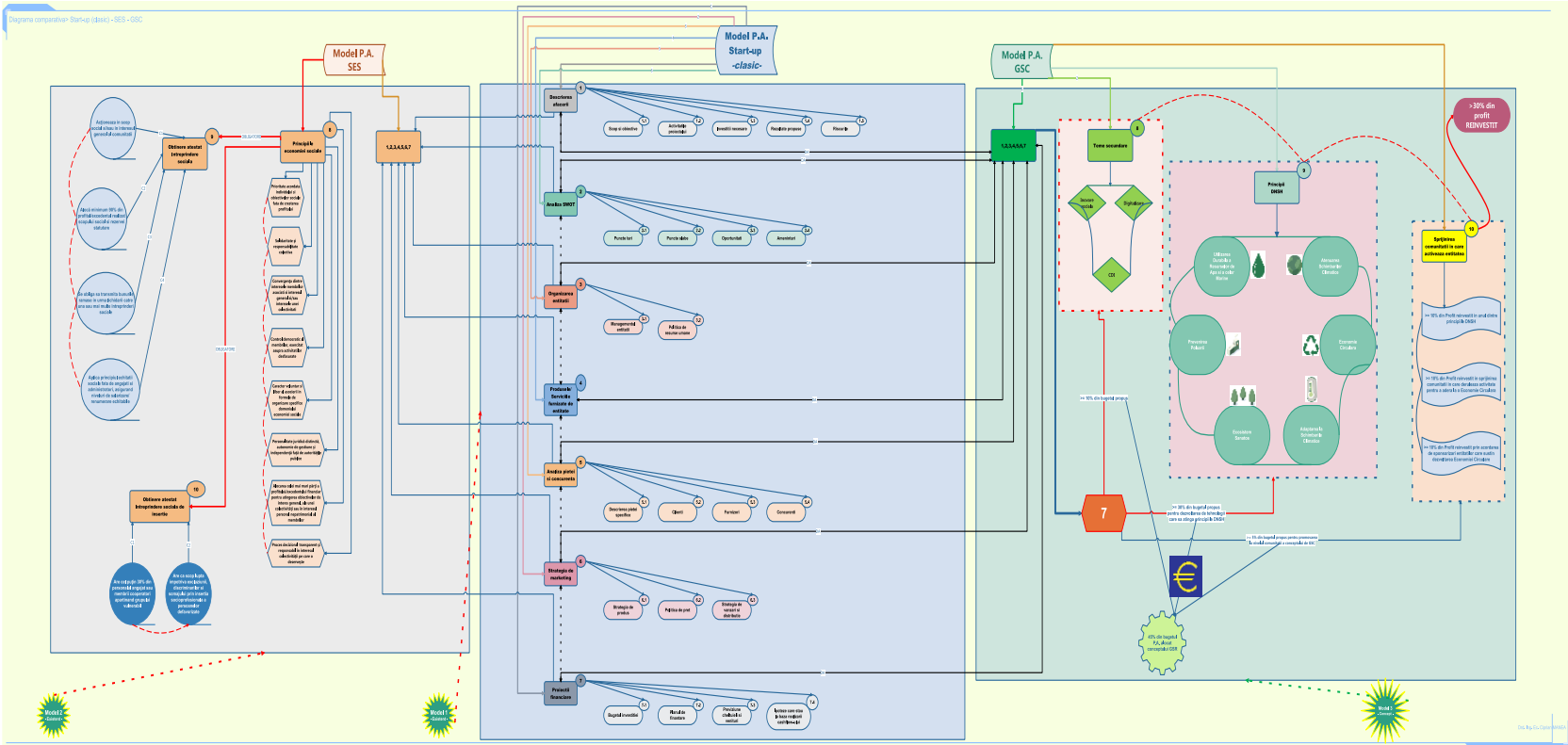


Diagram 2: Business Plan Models for Different Types of Start-ups in Romania

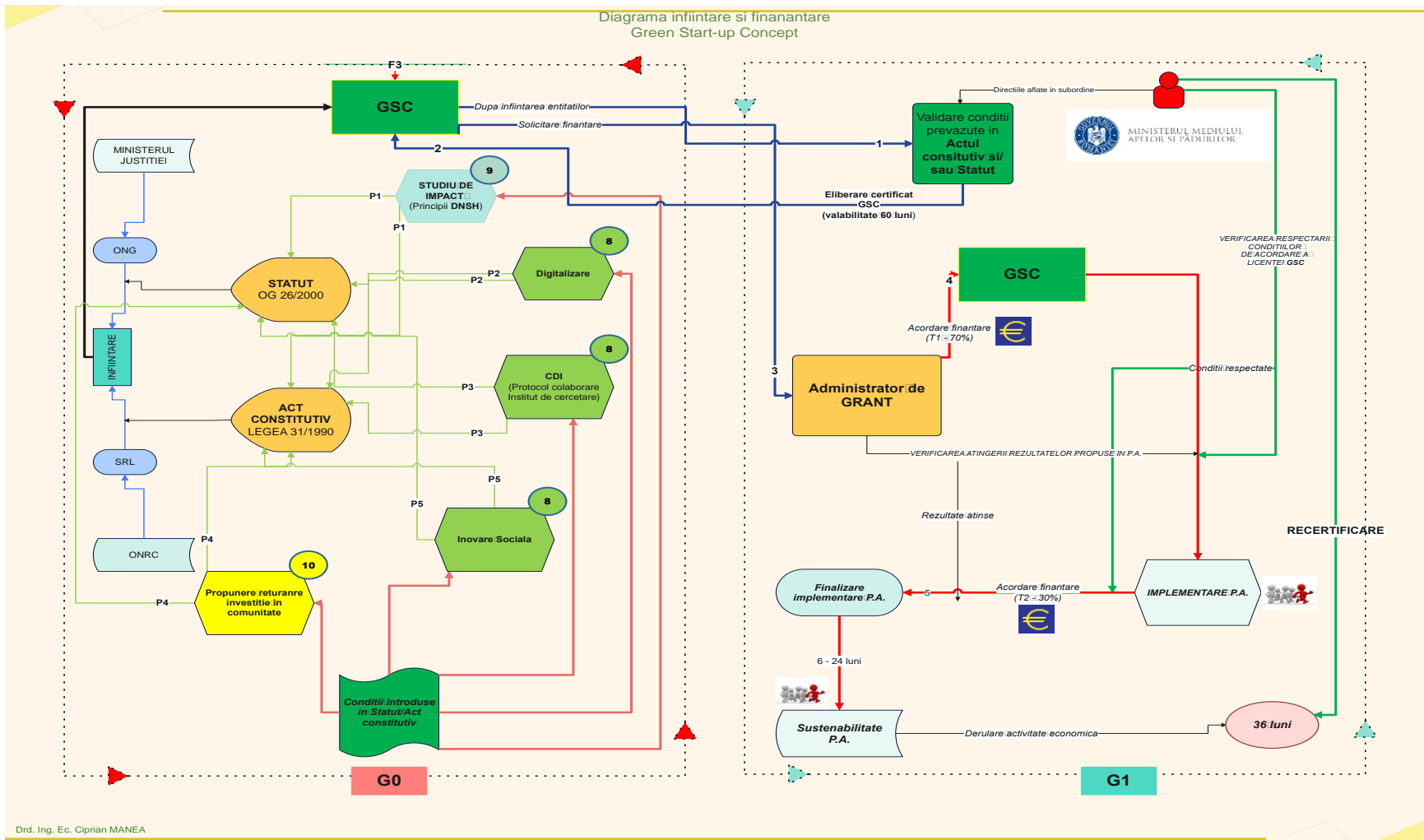


Diagram 3: Innovative Green Entity Concept

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