STRATEGIES TO PROMOTE ENTREPRENEURSHIP IN ROMANIA BY IMPLEMENTING INNOVATIVE SOLUTIONS FOR FINANCIAL SUPPORT

Mircea BOSCOIANU¹
Gabriela PRELIPCEAN²
Emilia CALEFARIU³
Angela Nicoleta COZORICI⁴

ABSTRACT

Promoting entrepreneurship in Romania is essential to support sustainable development in post-crisis period. The main attributes that recommend SMEs as innovative leaders are: the capabilities, knowledge, strategies and organizational development. Considering the low efficiency of current strategies due to volatility global business (constantly changing customer expectations and identity, disruptive technological change, acceleration of innovation-based competition, market orientation for higher returns), as well as reduced potential of Romanian SMEs to achieve critical profitability, new research is required on how to ensure financial resources. Given the progress of science and technology, and the changing of the paradigm of global competition, the interest will refer to technological SMEs that have the capacity to generate growth and new jobs.

The problem of technological SME financing is critical in Romania. The banking system is not interested in these types of projects and the capital market is still inaccessible for this type of investments. The government efforts to solve this problem are limited by the lack of appropriate tools, markets and institutional architecture. In this case is necessary to analyze new innovative financing solutions better adapted to the current dynamics of the technological entrepreneurship.

We are considering the development of innovative solutions based on market functionality and institutions that could contribute to the robustness of the central pillar of promoting entrepreneurship in Romania as an emerging country. This approach will result in a natural, sustainable and flexible current business environment support, with multiple implications at the micro and macroeconomic level. The implementation of innovative financing solutions in Romanian SMEs is a complex initiative, but the results are visible immediately, contributing decisively to the development of entrepreneurship through a simple, concrete, based precisely on solving the main current issues promotion and financial support.

KEYWORDS: Entrepreneurship, RDI (Research-Development-Innovation), SME Financing, VCF (Venture Capital Fund), Technological SME

JEL CLASSIFICATION: L26, G24, O32

¹ Transilvania University of Brasov, Romania, boscoianu_mircea@yahoo.com
² Stefan cel Mare University of Suceava, Romania, gprelipcean@yahoo.com
³ Transilvania University of Brasov, Romania
⁴ Stefan cel Mare University of Suceava, Romania
1. INTRODUCTION

Returning slowly and rather unconvincing following the recent crisis and global turbulence (2007-2012) led to the need of reconsidering the macroeconomic development models, starting precisely with the role of entrepreneurship and with its ability to achieve surprising performance. Promoting entrepreneurship in such a volatile environment, characterized by a constantly changing customer expectations and identity, a disruptive technological change, an a acceleration of innovation-based competition, market orientation for higher returns is essential, new research being required, showing concrete, effective and fast implemented strategies.

Financing SMEs, and especially technological and innovative ones, remains a sensitive issue, especially in the context of the banking system that has reconfigured it’s appetite for financing projects with low risk and the risk profile of investors in capital markets has changed profoundly. SME financing problem becomes more critical in emerging countries, owing to increased uncertainty and the accumulation of elements of distrust in financial markets.

For Romania, the development of entrepreneurship, based on technology, R&D and innovation, could be a solution to meet the need for convergence and „catching up”.

The advantage of technological SMEs to large firms starts from flexibility the agility of the response to elements that determine change and the ability of experimentation. On the other hand, there are disadvantages related to the access to resources, skills, the volatility of cost structure, limited access to knowledge and human capital, access to technology transfer.

2. THE CURRENT STATE OF RESEARCH IN THE FIELD

Technological entrepreneurship represents the sequence of processes through which organizational resources are assembled, and technological systems with the strategies of targeting the opportunities. Technological entrepreneurship involves the identification of high potential, of commercial opportunities associated with intensive technologies, superior resource fructification and prudent management of fast dynamics through elite decision-making skills. Technological Entrepreneurship fructifies unique abilities (the agility in a constantly changing environment, team spirit, openness to innovation, passion for top areas) (Roberts, 1989). Motivation is essential and is based on the desire for independence (liberty and control, overcoming bureaucratic barriers, pursuit of target achievement), wealth and exploitation (Oakey, 2003).

Modern technological SMEs are characterized by: innovation capabilities and creative thinking encouragement; balanced organizational structure that encourages flexibility and experimentation of new architectures; quality of human resources; a creative environment based on innovative structures at all levels; a good orientation on customers and investors. A volatile external environment implies special attention on adaptability and flexibility.

The development of technological SMEs is sustained by innovation (at the level of products and services, as well as organizational management) and value creation takes place by leveraging differential performance and focus on opportunities – efficient use of resources and the formulation of strategic options, the creation of new markets or business.

Technological innovation of SMEs takes into account the type of innovation (products, services), the industrial sector, and the technological change generated by innovation and the process of management of innovation and is expressed by the total number of innovations made relative to the number of employees. MacPherson (1997) indicates a directly proportional relationship between the performance of a SME and the external support, of scientific nature, technical and vocational. In contrast, Didd (2009), criticizes the existence of a directly proportional relationship between CDI and the development or the profitability, identifying other relevant factors, such as: the level of managerial experience and the technological know-how of the entrepreneur, the propensity to stimulate innovation or the proactive activities.
To accelerate and streamline knowledge transfer, specific vehicles can be used, like business incubators, industrial parks or spin-off through partnerships with the academic community. The academic environment works by three pillars: educational, cooperation with high-tech companies (clusters, technological parks) and the creation of new high-tech companies (based on academic RDI, incubators and spin-offs). The academic environment is both a source of scientific and technical knowledge growth, as well as entrepreneurial growth (Lofsten, 2005). Scientific discovery and advanced research orientation, contribute to the development of incubators and university spin-offs. The main purpose of a university incubator is to develop new successful business through the implementation of financially viable programs with a potential to create new jobs, to commercialize new technologies, to revitalize and sustain the local economic environment through link between the academic environment, the research centers, large enterprises and SMEs. Incubators are business support structures which support a successful and accelerate development of start-ups by providing resources and services to entrepreneurs. The incubator is a unique and flexible combination of processes, infrastructures and staff for the support and development of new business. Incubators accelerate and systematize the process of creating successful businesses by providing support in an integrated and comprehensive manner. Spin-offs are change agents that encourage synergistic economic value through satisfying customer’s needs, manufacturing of innovative products, generating of highly skilled jobs, attracting investment for development and generating a local impact (Shane, 2004). Academic spin-offs are considering the exploitation of intellectual property created in an academic institution (DEC – Digital Equipment Corporation; Massachusetts Institute of Technology; Wang Computers – Harvard University; TurboGenset – Imperial College Marea Britanie) and could represent the basis for development of partnerships in which technological SMEs, receiving grants for RDI projects.

3. CHARACTERISTIC FEATURES REGARDING THE FUNDING OF TECHNOLOGICAL SME

Berger and Udell (2006) analyzed the solutions for SME funding starting from the so called technology loan, a unique combination of primary information sources, protection policies and procedures, loan contract structure and mechanisms / strategies for monitoring. The issue of comparative advantage of large firms financing transactions towards SMEs considers both the lack scalability, informational opacity, as well as the costs associated with such transactions. SME financing problem actually starts to the heavy identification of the lending technologies. It is difficult to test linking financial structures theories with credit availability on different types of customers. The idea of a national infrastructure regarding the availability of credit to SMEs which includes the information, legal, juridical, social, environment, taxes and regulations, does not correspond to the current state of globalization of financial systems.
Credit-scoring models used since the 1990s for loans below 100 K Euro refers to opaque SMEs, characterized by a high risk and high interest funding. In the asset approach, financing of the working capital has as collateral the company's assets (Udell, 2004). The factoring focuses on the underlying asset and not on the overall value or the risk to the company level. Leasing is a financing method for equipment, auto vehicle and even buildings or land, giving the option of purchasing these assets at the end of the contract at a price specified before.

The financing of technological SME which are based in RDI is difficult in competitive market conditions (patent protection, copying inventions, underfunding). Some authors have demonstrated market failure of RDI with an impact on the process of funding from external sources. Over 55% of the RDI costs refer to wages given to a very well-educated workforce engaged in long-term projects, the achievement of which involves considerable adjustment costs, with impact on critical return associated with RDI activities (Hall, 1986; Lach, 1988). RDI projects are characterized by a high degree of uncertainty at the level of results, which does not allow the use of traditional methods for risk adjustment (Scherer, 1998).

Hall (2000) proposed the concept of cost of use of RDI investment ($\rho$ or MPK), calculated from the condition of achieving a return ($r$):

$$MPK = \rho = \frac{1 - A^d - A^c}{1 - \tau} (r + \delta - \Delta p_R/p_R) + MAC$$

where:
- $\tau$ – tax rate;
- $\delta$ – (economic) depreciation rate;
- $p_R$ – relative appreciation or depreciation of RDI capital;
- MAC – marginal adjustment cost.

$A^d$ and $A^c$ – the present value of depreciation allowance and tax credits respectively.

In this relationship there are highlighted the following factors of RDI funding: $\tau$ (which may be subject to exogenous intervention through various policy); $\delta$ (the economic depreciation) which can be regarded as an obsolescence, a sensitive value in relation to the dynamics of technological change in branches, which in turn is influenced by competition, market structure and the capacity
to imitate; marginal costs of adjustment at the level of the RDI program; critical return required by the investor (r).

The critical return required by the investor is the most important element that actually determines the feasibility of financing strategies and was analyzed from two perspectives: starting from the role of asymmetric information and moral hazard in exaggerating the critical growth return compared to the traditional investments; restrictions on the level of possible financiers.

Regarding the returns modeling in a dynamic environment, the returns evaluation can be made starting from the risk-free rate correction expressed by generalized Wiener processes (geometric Brownian motion) with risk premiums in the following variants:

a) stochastic differential equation (Merton, 1973):

\[ dr_t = \alpha r_t dt + \sigma dB_t \]  

where: \( \alpha, \sigma \) are positive constants;

\( r_t \) – Risk-free rate;

\( B_t \) – Brownian motion.

b) stochastic differential equation (Black-Scholes, 1973):

\[ dr_t = \mu r_t dt + \sigma r_t dB_t \]  

with: \( \mu, \sigma \) positive constants.

c) Ornstein-Uhlenbeck model:

\[ dr_t = (\alpha + \beta r_t) dt + \sigma r_t dB_t \]  

with: \( \alpha, \beta, \sigma \) positive constants.

d) Vasicek (1977) model:

\[ dr_t = r_t (\eta - a \log r_t) dt + \sigma r_t dB_t \]  

with: \( \eta, a, \sigma \) positive constants.

e) Cox, Ingersoll, Ross (1985) model:

\[ dr_t = (\alpha + \beta r_t) dt + \sigma \sqrt{r_t} dB_t \]  

with: \( \alpha, \beta, \sigma \) positive constants.

f) Chan (1992) model:

\[ dr_t = (\alpha + \beta r_t) dt + \sigma r_t^{\gamma} dB_t \]  

with: \( \alpha, \beta, \sigma, \gamma \) positive constants.

The main problem is however the setting of the risk premium that is variable in time, being affected by factors both at micro and especially macroeconomic exogenous factors.

In the literature there are highlighted three types of factors that are contributing to increasing the value of external financing, compared to the internal one: informational asymmetry entrepreneur-
investor; moral hazard resulted from principal-agent problem through financial leverage link; tax rate.

Informational asymmetry and the principal-agent conflict lead to more expensive RDI funding by share issue, while the lack of domain specific collateral, almost completely blocks lending. Hall (1992), Himmelberg (1994) showed that investment decision RDI should be filtered through the condition of a positive cash flow. This, however, would severely restrict a number of projects with high potential but characterized by volatility results. RDI projects should be treated on a case by case according to the level of uncertainty, novelty character, the level of competition at the level of industry of interest, the speed of technology transfer, the effective opportunity of results fructification on serial product level. Just starting from this observation, funding strategies must take into account the structure of the financing mix, the estimation of the success rate in relation to the branch in which they compete, possible delays in testing, development, implementation and modernization. The rejection of interesting projects but poorly understood, is at this moment a common practice. The problem could be solved by setting up diversified RDI projects portfolio, with partners belonging to several categories and through innovative financing solutions which would respond flexibly to the challenges mentioned. Further there will be analyzed VCF funding, in which portfolios are balanced by industries and categories of applicants starting from a possible role of the government in financing technological SMEs.

4. STRATEGIES, STRUCTURES AND INVESTMENT VEHICLES DEDICATED TO TECHNOLOGICAL SME FINANCING

The presence of information asymmetry and moral hazard in a changing environment complicates the assessment processes of firms and meeting entrepreneurs with investors. VC are financial intermediaries specialized in the selection and the monitoring of companies of interest. These intermediaries lead to an increase in the efficiency, precisely by reducing principal-agent conflicts through the link of consultancy and monitoring (Cornelli, 2003), the protection mechanisms used (Chan, 1983), the output mechanisms (Berglof, 1994), the phasing of investments (Bergmann, 1998) or by investment collaborative partnerships (Admati, 1994). VC investors are interested in new firms from technology intensive branches characterized by significant information asymmetries but with the possibility of monitoring. With this strategy, in fact there is provided a risk control assuming low initial investment. In addition, these pilots allow a convenient staging of investors and increasing the share of tangible assets will reduce the risk in case of failure. Regarding the business exit, the best known mechanism is the initial public offering (IPO) together with public listing of SMEs.

Kaplan, Schoar (2005) analyzed the performance of VCF and showed that these funds almost always succeed to perform over the branch. Cochrane (2005) analyzed the returns of VCF and showed that statistics stop at the level of the firms that are listed through the IPO, which eliminates failures and oversize’s the performance. Gompers, Lerner (1999) analyzed the relationship between investors (limited partners) and the general partner, showing that for new funds VCF managers manage portfolios with passion aiming at increasing reputation and obtaining new funds to administer. The share of administration costs depends on the size of the fund. The VCF presence in the Romanian capital market landscape could have consequences related to stimulating innovation and increasing the frequency of opening windows of technological opportunities, essential elements for sustainable development. As a result it justifies the role of government intervention in the creation and development of these structures.
For Romania there is an extensive set of problems that restrict VCF financing such as: low value projects, high costs of VCF management processes (management portfolio, selection, consultancy, preparation of IPO) so it will be proposed below different strategies, simpler but better adapted to the current realities. Even if the VCF does not involve actually a direct investment, in the case of a portfolio according as projects maturing and growing of share of tangible investments allows viewing performance and provide trust, the current capital market and the market institutions have not the power to provide a benchmark for investor with appetite for risk. For Romania, the bond market could benefit from reduced interest rates, providing solutions including for technological SMEs. These SMEs could be grouped by scoring for 2-3 tranches of risk.

This provides a simple mechanism by which firms issue bonds and sell these bonds to a intermediary dedicated vehicle which in turn distribute these instruments to investors. It results through diversification a simple product, easy to understand, high yield and low risk. When we analyze the funds supply, there are few retail investors, but existing bond funds would be extremely interested in this type of product. The viable solution is therefore simple to implement, provides critical liquidity and may open up the way to the new more sophisticated innovative products.

**Figure 2: Technological SME financing based on bonds hierarchized based on risk premium**

*Source: made by authors*

VCF-PPP is a hybrid solution that integrates both the advantages of VCF funds, but also the efficiency of a flexible PPP architecture, as a possible solution for emerging markets. VCF-PPP brings the required flexibility by the liquidity through injections into doses and in the critical moments of VCF fund opening, which initially is a closed fund government. The government's initial role as founder and liquidity provider (to a portfolio of companies selected by a consultant) is transferred to the private area, which through acquisitions of fund units benefit from technological SME performance offering new funds for new funding.
The transfer from the public to private area is preferred by issuing (semi) open equity fund, which eventually could become open fund including for retail investors. In this architecture, VCF-PPP is a more flexible and may provide new funding for new projects in the technological SME. This is a gradually development process based on market mechanisms, demand-supply fund setting are consistent with the intervals of the opening of the fund. Also in this way it solves the scalability issue related to the initial size of the fund, the development will be then correlated with the absorption capacity of funds on demand side from technological SMEs.

5. CONCLUSIONS

Romanian technological entrepreneurship could provide a robust regional development support. For a better understanding of the creation, development and fructification mechanisms of this potential, the elements of technological entrepreneurship need to be reconsidered and harmonized (the entrepreneurial environment, business financing, collaboration with the academic community and the big companies, the role of consulting firms, markets / customers, the role of the government)

The government should encourage the establishment and development of technological SMEs. Providing a friendly business environment implies: the development of macroeconomic policies; a legislation that ensure favorable conditions for SMEs; providing solutions to emerging problems; the development of entrepreneurial culture (Glas 2000). For efficient interventions (specific programs to support SMEs; stimulating solutions for tax reduction; procedures simplification; access to finance; consulting and access to information; support for establishing partnerships) is necessary to reconsider the mix between political strategies, institutions and government programs.

The main policies to support technological SMEs in mind:

- creating a stable and friendly business environment (stable and predictable regulations, institutions and policies concerned with the development of SMEs, plain management regulations and to stimulate the creation of new firms, reduced fees and simple protection mechanisms);
- stimulating internationalization (by promoting the involvement in collaborative research partnerships with public support, easing financial barriers for internationalization, increasing the efficiency of innovation policies, supporting the participation in global value chains, brokerage and information to assist SMEs in the analysis and fructification of the collaborative opportunities);

- improving the management of intangible / intellectual assets (intellectual property protection, support for the development of a market for professional services, intellectual property rights system adaptation to the needs of entrepreneurs);

- developing the skills of entrepreneurs (education, interactive learning methods based on practical experience);

- operating efficiency of the opportunities resulting from public research (facilitating academic spin-offs, stimulating collaborative activities between universities, research organizations and SMEs through specific knowledge transfer infrastructure like business incubators, scientific parks, collaborative research programs, job mobility, promoting the development of clusters and connections with local innovation systems, increasing the absorption capacity of innovation in SMEs and research organizations motivation in the transfer of knowledge to SMEs, using the public procurement for request acceleration for innovation);

- strengthening the mechanisms for the exchange of information (supports for evaluation of SME and entrepreneurship policies through impact evaluations; encourage international exchange of the experience related to policy success, failures and best practices);

- other ideas (evaluation the policy requirements to ensure that new firms can take advantage of technological and commercial opportunities, developing partnership programs to assist governments in policy design in this domain, implementation and evaluation of the growth performance of SMEs; solving problems with entrepreneurial skills; understanding of good practice in entrepreneurship; understanding the role of government; development of indicators to measure the ability to change the entrepreneurial skills and support policy evaluation in volatility conditions).

The technological SMEs face high costs of financing. The previous government efficiency solutions as business incubators, guarantees, and other financing policies in Romanian CDI was reduced and no additional elements that create synergy and leverage effects created the image of lack of concern about promoting technological entrepreneurship. The VCF presence in Romania, focused on technological start-ups would be most beneficial although the number of industries of interest to VCF investors is reduced. In addition, the out of these businesses strategies involves on the one hand a strong capital market, on the other hand institutions and experienced investors.

In this article we proposed several strategies for financing technological SMEs based on simple principles that can provide fast and efficient implementation. In the first proposal, companies interested in long-term financing bonds issue in the first phase are acquired by a dedicated brokerage vehicle (VDI), which then distributes these tools to institutional investors (investment funds, pension funds, insurance companies) interested in obtaining higher yields. Another strategy combines the advantages offered by VCF with the ingredients of PPP in a (semi) open architecture resulted from the opening to private investors.

Future research might focus on the following aspects: detailed studies on the mechanisms of interaction between financial markets and the management of technological SMEs or fund management of VCF/VCF-PPP; analysis of the incentive solutions for innovation performance based on the financial support of technological entrepreneurship through innovative financing mechanism dedicated to this segment of SMEs.
REFERENCES


