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Management of Innovation
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How to Finance Innovations: Issues and Possible Instruments

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ABSTRACT

This paper discussed the issues and possible instruments that are linked with the financing of innovation activities and projects. The paper elaborated the sources of investment to carry out innovative programs and also demonstrated the importance of government funding and venture capital, especially for the newly establish companies. The paper also discussed the key arguments like the significance of cashflow and role of asymmetric information, and depicted that how these factors can affect while financing an innovative activity or project.

1. INTRODUCTION

Innovation means development of new ideas or innovative solutions to a given problem. Innovation can be the development of new technology or can be the use of already existing technologies to develop a innovative solution. In order to accomplish the innovative activity or project, some sources of finance are needed for investment.

The research and development activities are effected by finance. The probability of high success at the beginning of an innovative activity is very low and that increases the uncertainty of the outcome of innovative activity or project. But innovative activity requires smooth and continuous funding for its accomplishment. That's why an innovative activity requires different sources of finance, which can be from public sectors, banks in form of loans, government funding and venture capital etc.

Venture capital helps the new companies, operating in high uncertain markets, in financing their innovative projects and activities. It plays a crucial part in innovation development. It helps the companies in continuous growth of innovative activities and future success.

2. Sources of Finance for Investment

The availability of sources of finance for innovative companies is the first step towards financing innovations and it depends on the phase of the innovative process/activity [1]. For example if the innovative project is in the "research phase", then the available sources of finance can be public sectors or commercial companies. While in "development phase", the sources of finance will also include the venture capital and loans. In "start up phase", the sources of finance include public sectors, venture capitals and also from some firms that are buyers of the new company. When the innovative project is in full commercial operation, the available source of finance can be the banks, the revenue generated by the company, the investment from public sectors, issuing of bonds, and internal capital markets. In particular, for our ASP¹ project "*Integrated Technologies for the Sustainable Management of Underwater Cultural Heritage (TETI)*", the sources of finance for innovative activities are bank foundations for loans, scuba diving associations because they generate economic return from tourists to help them visiting the underwater museum and tourism companies because they also generate revenue from tourists.

3. Significance of Cashflow

The R&D² has some particular characteristics associated with the smooth cashflow that need to be discussed. The first factor is the salary and wages of engineers and scientist that are working on the research and development activities. Based on the efforts and research work of these scientist and engineers, the profits in the future can be predicted. If these employees are fired or they leave the company that will definitely affect the outcome of the R&D [2].

¹ *Alta Scoula Politecnica , 6th Cycle*

² *Research and Development*

The second important factor is the uncertainty associated with the output of R&D and also the uncertainty on the future cashflow. The probability of great success at the beginning of a research activity or project is very small this means the uncertainty of associated with the output of the R&D is very high at the beginning a research project or activity. The uncertainty on the future cashflow also largely affects the R&D that's why R&D requires a smooth and continuous investment funds for many years.

4. Role of Asymmetric Information

In the case of R&D, the meaning of symmetric information is that that the innovator knows better about the probability of success and expectation of outcome of innovative project or activity than the investor who is going to invest in that innovative activity [2]. When the innovative project or activity is long term then it will pose difficulties for investor to distinguish whether it is a good project to invest. But when the projects are short term or especially low risky projects, then it is easy for investor to decide whether to invest or not.

There are three forms of asymmetric information in financial markets: adverse selection, moral costs and monitoring costs [3]. The adverse selection occurs before the investor invests as compare to moral hazards and monitoring costs. An investor suffers the "adverse selection" when he is unable to understand the risk level associated with different project when investing the money. Usually, investors prefer the low risk projects while borrower prefers the high risky projects [4]. So, the borrowers who have risky projects hide the actual nature of the projects or activities from the investors and due to this lack of information of investors about true nature of projects, borrowers are able to get the investments for risky projects. Consequently, a risky borrower takes advantage of asymmetric information. "Moral Hazards" means that the borrower uses the investment for different uses than on the project agreed by the investor due to the lack of information of the investor. "Monitoring costs" usually linked with the hidden activities of borrower because borrower has better information than investor so that the borrower can demonstrate lower earnings to investor than actual earnings [5].

5. Government Funding

The problem of financing the new technology or innovation is highly probable for new establish companies. For this purpose government funding is very useful for solving the financial problems for such new companies. Now, we will elaborate some of the examples of such activities taken by the government for the assistance of new entrants. Starting from the US, SBIC³ and SBIR⁴ are the two

programmes, in which some assistance was provided to small business companies for research and innovation. According to the data collected in 1995, these programmes spend \$2.4 billion for the assistance of small and new establish companies [6]. The study carried out by Lerner [7] showed that the companies which receive SBIR funds grow more faster as compare to companies which donot receive such grants. In 1980, Swedish government also started such kind of programmes and also encouraged private investments for new companies by reducing taxes. In past few years, German government also started nearly 800 financing programmes for new entrants [8]. UK has also started such programmes to provide funds to new entrants and startup firms in new technology and also manage a system of loans for such small firms [9].

6. Venture Capital

Venture Capital (VC) is an essential component for financing the hi-tech venture when they are in early stage of development [2]. VC helps the new companies, operating in high uncertain markets, in financing their innovative projects and activities. New companies that are financed by venture capital grow faster as compare to companies with private R&D. In 2004, Pottelsberghe and Romain studied and analyzed the investment of venture capital in 16 OECD⁵ countries. Their results shown that companies financed by venture capital are twice more productive than the companies with private R&D [10]. In 2001, Engel carried out studies on German firms that are founded between 1991 and 1998 and showed that firms that are supported by venture capital grew faster as compare to the firms not supported by venture capital [11]. Also, a report from EVCA⁶ in 2006, based on data collected during 2000 to 2004, shown that companies financed by venture capital have 30 per cent annual growth in employment in EU [12]. So, venture capital plays a crucial part in innovation development. It helps the new companies in continuous growth of their innovative activities and future success [13].

In the end, I also want to highlight the current fund cutting situation of Italian universities. Recently, Ministry of Italy has cut down the funding to Italian universities by a large amount. Since, I am the student of Politecnico Di Torino, so I will highlight the situation in Politecnico Di Torino. The funding for Politecnico Di Torino was approx. 7100 million Euros in 2010 and it is cut down to approx. 6100 million Euros in 2011. This sudden sharp cut down of funds affected each department of Politecnico Di Torino, especially the Researchers group, who are involved in many research and innovative activities. So, sometimes the decision taken by the by Ministry about the allocation of

³ *Small Business Investment Company*

⁴ *Small Business Innovation Research*

⁵ *Organization for Economic Co-operation and Development*

⁶ *European Private Equity and Venture Capital Association*

funds to Italian universities severely effects the research and innovation activities.

7. CONCLUSION

The main aim was to discuss the issues that are associated with financing the innovation. Different sources for financing the innovation are available like public sectors, venture capital, loans from bank etc, depending on the phases of the innovative project or activity. Each innovative project or activity has an uncertainty of success associated with it, that is why it's difficult for investors to decide whether to invest or not. Also, an innovative activity or project requires continuous and smooth cashflow for its accomplishment. An innovator uses the asymmetric information to get the investment for the risky projects by hiding the actual risk level from the investor.

Government funding is very useful for solving the financial problems for such new companies because the problem of financing the new technology or innovation is highly probable for new entrants or firms

Venture Capital is a crucial factor associated with financing of hi-tech venture when they are in early stage of their development. In high uncertain markets, it helps the new companies in financing their innovative projects and activities. It is also useful for the new companies in continuous growth of their innovative activities and future success.

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