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Optimum Shares of Venture and Credit Financing of Investment Projects

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Abstract

The article describes a way to adopt portfolio analysis to the task of finding the optimum shares of venture investments and credit financing for the same investment project. This task is actual when an entrepreneur (owner of invested company) is not ready to give an investor too high share in this company capital for the required amount of investments, so the part of requested money could be provided in the form of credit.

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1. Introduction

In case of necessity of external financing for a risky investment project an entrepreneur can use different ways. In this paper we consider two of them – venture investments and credit, which are opposite to each other in terms of risks taking and participation in profits. We consider credit financing from venture investor itself, as an access to credits from traditional credit organizations (banks) is usually difficult for small risky companies. So the question for a venture investor could be – what is the optimum combination of venture investments and credit funds amount.

The previous research work in that field concerns such matters as role of banks in the financing firms receiving private equity capital, which is considered by Vacca (2013), who discusses the evolution of the financial structure of the target firms during the fund intervention, as well as the relationships between target firms and the banking system (the amount of credit) and the matters of credit costs. The question “Why do some start-up firms raise funds from

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banks and others from venture capitalists?” is discussed by Ueda (2000). The problems of economics of financing small business firms in private equity and debt markets, such as the sources of small business finance, how capital structure varies with firm size and age, the interconnectedness of small firm finance as well as the impact of the macroeconomic environment are considered by Berger and Udell (1998).

The models of start-up investments is also discussed by Keuschnigg and Nielsen (2003). Rigby and Ramlogan (2013) compare alternative ways innovative projects financing: publicly supported venture capital and government backed loan guarantees. They pay special attention to the moral hazard problem which could arise as a result of venture capital support and credit guarantees. Also, Fraser, Bhaumik and Wright (2013) consider financial needs of growing firms and traditional financial sources (such as asset based lending, banking relationships, trade credit etc.) and non-bank resources (venture capital, business angels etc.) in connection with information asymmetry, market failures and so on.

Actually, each way of financing has its own return and risk levels. So far it would be possible to use the tools of portfolio analysis which is an instrument of investments distribution to different assets with different return and risk characteristics. However one of specific feature in our case is that both ways of financing are connected with some single investment project, so we need to define risks and returns specifically for a given company (project), and not through statistic analysis, as it usually done in portfolio analysis.

We should also note that though portfolio analysis is usually of “one period” character, i.e. in current period the optimum investments structure for the next period is defined, this can't prevent us from using it for analysis of multiperiod investment projects, as we can consider the whole project as realized in a single period with duration of several year, necessary for its realization. We could define return of investor through annualized return rate basing on ratio of investor's cash inflows and investments made during the period of project realization, with the formula (1).

$$\pi = \sqrt[T]{\frac{\sum_{t=1}^T \frac{P_t}{(1+r)^t}}{\sum_{t=1}^T \frac{I_t}{(1+r)^{t-1}}} - 1} \quad (1)$$

where π is investments rate of return, T is project duration, P – cash inflows for investor, I – investments necessary for project realization, r – discount rate.

In portfolio analysis the necessary parameters of assets are usually derived from the statistics of past returns. We do not have such statistics for investment projects, which are financed from almost zero level, so we should use some other approach, presented in the article.

2. Rate of return and risk of venture investment and credit financing

First of all we have to consider rate of return and risk level of venture investment. As a rule, when an investment project is composed, some basic (most probable, in investor's opinion) variant of its realization is defined, and other possible variants are compared to it. The rate of project success is defined mostly by volume of sales, as the revenue generated profit and later value of investor's share in the project, when he decides to exit from the project.

In portfolio analysis risk level is measured with some bottom limit of asset value which would not be crossed with some high enough probability. In our case it is natural to suggest that such a limit is represented by volume of sales which does not allow to return money invested in venture company shares.

In case of credit its rate of return is equal to the interest rate, if this credit and interest are accurately repaid by the debtor. The level of risk of lower here. Actually if a debtor is not able to pay its debts, then it is a bankrupt. So we could say that credit risk is the risk of venture company bankruptcy. However negative cash balance (not paid money claims) of venture company does not lead by itself to the bankruptcy, as the company could ask the investor or someone else for help. So far we will consider bankrupts only those companies which have negative cash balance at the moment of project termination.

In a more clear form the rates of return and risks of venture investment and credit are shown on the Fig. 1, which depicts the scheme of profit generation on the enterprise. Variable and fixed costs, credit interest rate and profit tax are subtracted from the revenue. As a result, the enterprise get profit (which increases the income of venture investor) or losses.

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