

Original Paper

A Short Note on the Types, Concepts, Services and Activities of Financing and Simulation for Optimization for Financial Organization

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Abstract

A short Overview of the Types, Concepts, Services and Activities of Financing in Business Sector has been presented in this paper. Simulation for optimization for Financial Organization has been discussed analytically. The paper should be useful for the financial advisor of the corporate sector.

Keywords

financing, types of financing, equity financing, debt financing, personal finance, corporate finance, firm's capital structure

1. Introduction

Financing is defined as the process of providing funds for business activities, making purchases, or investing, e.g., making a scientific laboratory or an academic Institution. Financial Institutions, like banks, are doing business of providing capital to businesses, consumers, and investors for helping them to achieve their goals. Financing is vital in economic systems for allowing them to purchase products for their immediate needs and requirements. Thus financing is a technique to leverage the Time Value of Money (TVM) for arranging future expected money flows to use for presently started projects. Financing makes use of the fact that some individuals in an economy will have a surplus of money which they wish to put to work for generating returns, while others demand money to undertake investment, creating a market for money. Such individuals make a Cooperative Society for undertaking and completing a project. There are two types of financing: Equity financing and Debt financing. Equity financing is advantageous since there is no obligation to repay the money acquired by it. Also, Equity financing puts no additional

financial burden on the company, even though the downside is sometimes quite large. On the other hand, Debt financing is comparatively cheaper and also has tax breaks. But the problem in this case is that large debt burdens can lead to default and credit risk. The weighted average cost of capital (WACC) provides a clear picture of a firm's total cost of financing. A lot of interest has been shown (1-11) by the researchers in this field.

2. Financing

Two main types of financing are: debt financing and equity financing. Debt financing is a loan which has to be paid back mostly with interest, but still it is cheaper than raising capital due to tax deduction. Equity financing does not need to be paid back, but the shareholder has to relinquish the ownership stakes. Both debt and equity have their advantages and disadvantages, and so most companies use an optimum combination of both for their operations.

Equity means ownership of the individual or a society, e.g., the owner of a goods store chain requires to grow his operations in the business. He may like to sell a 10% stake in the company for Rs100,000, valuing the firm at Rs 1 million, instead of taking debt. Companies are interested in selling equity because since the investor bears all the risk. Clearly, if the business fails, the investor gets nothing. However, parting with equity implies giving up some control. Equity investors expect to have a say in the operations of the company, especially in difficult times faced by the company, and are also entitled to votes based on the number of shares held by them. It is now well understood that Funding our business through investors has many advantages: We do not have to pay back the money. If our business faces bankruptcy, our investors are not creditors. As they are part-owners in our company, their money is lost along with that of our company. In addition, we do not have to make monthly payments, and therefore, we have more cash on hand for operating expenses. Of course, there are many disadvantages including: How do we feel about having a new partner. The riskier the investment, the more of a stake the investor demands. We might have to give up even about 50% of our company. However, if we later on have a deal to buy the investor's stake, that partner will take 50% of our profits indefinitely. We also have to consult our investors before taking any decisions, as our company is not solely ours. In case the investor has more than 50% of our company, we have to listen to him.

Debt financing is a form of financing used by many who have car loans or mortgages, and is also a common form of financing for new businesses. Debt has to be repaid, and lenders demand to be paid a rate of interest in lieu of the use of their money. Some lenders require collateral, e.g., if the owner of the grocery store decides to have a new truck and must take out a loan for Rs 50,000; the truck can serve as collateral against the loan, and the grocery store owner agrees to pay some x % interest to the lender until the loan is paid off in five years. There are many advantages of financing our business through debt: The lending institution has no say and control over how we run our company, and it has no claim to ownership. After we pay back the loan, our relationship with the owner comes to an end, which is

especially important as our business becomes more valuable and profitable. Also, the interest we pay on debt financing is tax deductible as a business expense.

Debt financing for our business has some disadvantages e.g. Adding a debt payment to our monthly expenses assumes that we will always have the capital inflow to meet all our business expenses, and also the debt payment. In recession times for the economy, it is quite difficult to receive debt financing unless we are highly qualified. Another important concept in financing is the weighted average cost of capital (WACC), which is the average of the costs of all types of financing, each being weighted by its proportionate use in the prevailing situation. The utility of this term can be judged from the fact that Firms decide the appropriate mix of debt and equity financing by optimizing the WACC of each type of capital while taking into account the risk of default or bankruptcy on one side and the amount of ownership owners are willing to give up on the other. The debt financing is preferred because interest on the debt is tax deductible, and because the interest rates associated with debt are lower than the rate of return expected for equity. WACC is computed by the well-known formula:

$$WACC = \left(\frac{E}{V} \times Re \right) + \left(\frac{D}{V} \times Rd \times (1 - Tc) \right)$$

where: E = Market value of the firm's equity
 D = Market value of the firm's debt
 $V = E + D$
 Re = Cost of equity
 Rd = Cost of debt
 Tc = Corporate tax rate

$$WACC = \frac{E \times Re + D \times Rd \times (1 - Tc)}{E + D}$$

where: E = Market value of the firm's equity
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 $V = E + D$
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The Individuals, businesses, and government entities all require funding for their operations, and so the finance field includes three main subcategories: Personal finance, Corporate finance, and Public finance. Personal finance is meant for an individual, i.e., his situation and activity; the related financial strategies depending mainly on a person's earnings, living requirements, and desires. Financial planning is based on analyzing the current financial position of individuals to formulate strategies for future needs within his financial constraints. Corporate finance is involved with the financial activities related to running a company.

Financial activities are the initiatives and transactions that individuals, businesses, and governments, take for seeking to further their economic goals. They are activities involving the inflow or outflow of money for buying and selling products, issuing stocks, initiating loans, and maintaining accounts. When a company sells shares and makes debt repayments, it is engaging in financial activities. Personal finance refers to planning, implementing, and managing financial activities which impact individuals, e.g., earning an income, spending money, saving and investing, and borrowing. The financial advisor should also have a very good knowledge of the financial institution (FI), which focuses on dealing with financial transactions.

Sometimes, financial advisors have to face the Depression in the Economy, which is a steep and sustained drop in economic activity featuring high unemployment and negative GDP growth. They have to understand the Federal Reserve Regulations, which are rules put in situations, usually in response to laws

enacted by the government. In addition, they have to know the net worth of an individual or business, which describes how much a company or person is financially worth. This is determined by calculating the value of the assets owned and subtracting the liabilities owed. Companies use this metric to find their organizational health, as the net worth summarizes a company's current financial position.

Financial professionals consider the net worth as being positive or negative. A positive net worth means having more assets than liabilities and a negative value means liabilities that exceed their assets. Thus, a positive net worth indicates good financial health, whereas a declining net worth shows a decrease in assets compared to liabilities. Another parameter to be considered by the Financial professionals is Inflation, which describes the decline in purchasing power of a given currency over time and refers to the sustained increase in the price of goods and services. They use the consumer price index (CPI) and the wholesale price index (WPI) to determine the rate of inflation. Individuals and businesses with tangible assets can benefit from an increase in inflation.

Liquidity refers to the accessibility of money or the ease with which we can convert our assets into cash. The most liquid of all assets is cash itself, whereas tangible items like real estate are less liquid. Market liquidity refers to the extent to which a market e.g. a real estate market, allows assets to be bought and sold at transparent prices.

A bull market indicates that the market is on the rise, as seen by an increase in stock prices and a low level of unemployment over an extended period; and it indicates that the economy is healthy, although financial professionals consider many factors when determining the health of a market.

Risk tolerance is the threshold of risk an individual is prepared to take with his investments. An individual's risk tolerance demonstrates his comfort level during economic swings, such as a bear market. Financial professionals use the capital asset pricing model (CAPM) to price investments based on the expected return rate, which evaluates the relationship between risks and the expected return for assets, specifically stocks. Thus, the Financial advisors have to optimize this parameter by considering all these factors.

Financial professionals use depreciation to their advantage by calculating the reduction of value in a tangible asset due to use, wear and tear, and obsolescence. For property, plant, and equipment (PPE) assets, they calculate the depreciation rate to better understand a company's assets value.

Amortization refers to the business practice followed by the financial experts of paying off debt, as this accounting technique allows them to lower the book value of an intangible asset or a loan over a period. This concept is quite similar to depreciation, except that it refers to intangible assets, such as trademarks and patents.

Financial management is very important for firms for determining profit and loss; as it is the operational process of a company that wants to acquire and utilise the funds efficiently required for company's activities. Clearly, it is primarily focusing on the efficient management of funds in the enterprise. This leads to effective procurement and proper use of finance results in suitable financial growth. These are some goals that firms should target. It is now established as an essential component of the financial

manager's job, which results in the financial manager to establish the fundamental goals of financial management, i.e., Maximising profits and Maximization of wealth.

The concept of financial management covers the entire range of activities and functions. In most organizations, the head of finance is considered as an essential advisor to the CEO and plays a strategic role by finding the total amount of funds required for a given period, increasing funds from different sources, and also maintaining cost efficiency in mind.

3. Simulation for Optimization for Financial Organization

It is interesting to note that simulation is used not to just focus on Optimization of financial organisation. It has more important purpose for base level Optimization, for which B_i is most important and commonly used formula of cognitive architecture $ACT - R$. Following the approach (Helmhout et al., <http://arxiv.org/abs/1409.0473v3>), the Equation for an estimation of the odds of all parameters of a financial activity, that is being used is given as:

$$B_i = \{ \ln(\sum_{j=1}^m T_j^{-d}) + \beta \} \quad (1)$$

where T_j denotes the time-difference ($T_j = T_{now} - T_{presentation}$) when the group is represented in memory, d denotes the decay rate of parameter like equity, and β denotes the initial activation. It is to be noted that the base-level parameter defines a logarithmic power function, which approximates the Power Law of Forgetting, when no chunks are presented and the Power Law of Optimization when many consecutive chunks are presented. The manager of the organisation has to note that the parameters of the base-level parameter equation can assign different rates of degradation of each individual or each group, and thus allows the individual to forget when no representations of a group take place, and also enables it to remember when representations take place.

As is expected, the financial groups are selected on the basis of matching and highest activation, selection being based on the expected gain or utility. If the Manager is involved in solving a goal, the individuals can be asked to solve the problem. But, as $ACT - R$ is a serial processor, the procedure has no choice other than selecting one with the highest expected gain or utility. In this approach, the utility of a procedure is defined as:

$$U = (P * G - C + \sigma) \quad (2)$$

where P denotes activity probability, G denotes the goal value i.e. the importance attached by $ACT - R$ to achieve a particular goal, C denotes the cost of using the procedures, and σ denotes the stochastic noise variable. It is clear that it is possible to assign a different G to each procedure, which influences the $ACT - R$ engine for choosing a specific procedure. However, in general, it is customary to assign the same G to all procedures. in most of the $ACT - R$ simulations. In fact, the probability P of financing is a factor of two sub-probabilities: q , the probability of the successful procedure, and

r , the probability of fulfilling the objective of the goal in case the procedure is successful. P is defined as:

$$P = q * r \quad (3),$$

which is the Probability of Finance Optimization Equation.

In this Eqn., Cost C denotes the amount of time required for the completion of the task with the procedure. It may be noted that the noise σ has to be added to the utility for creating the non-deterministic behavior, and not with deterministic behavior, in which case, the simulations of $ACT - R$ are not in a position to follow any other procedure having similar parameters. It is important to understand the procedure for learning parameters q and r , since they have strong impact on the behavior in the simulation procedure. Another important aspect of financing connected with the procedure is that it is of two types: (i) procedural symbolic financing, and (ii) procedural sub-symbolic financing. In the first type, $ACT - R$ distinguishes between specialization and generalization, in the sense that the specialization is used for often recurring problems and becoming routine and generalized, which is used in analogy problems. Surprisingly, $ACT - R$ has no stable and clear solution for the problem of this type of procedural financing. In fact, the procedural sub-symbolic financing is more prominently used on such studies. In this technique, the parameters of probability - q and r describe the success ratio of the use of the procedure, and reflect the frequency and occurrence of successes and failures of a production. Obviously, the parameter q is the success-ratio of directly completing the procedure; which in fact keeps record of the most recent successful execution of the condition and action aspects of a procedure. The parameter r gives the computed success-ratio in the achievements of completing an objective of a goal, after solving all the sub goals and after achieving and popping the current goal level. In other words, all goals that follow the current goal have to be fulfilled successfully to accomplish the current goal. The financing probability is defined as:

$$q, r = \left\{ \frac{S}{(S + F)} \right\} \quad (4),$$

which makes it clear that in the beginning, either S (Successes) ≥ 1 or $F \Rightarrow 1$. By default initialization of the procedural parameters, S is given a value of 1 and F (Failures) a value of 0, which is based on the optimistic view of the success of the procedure being followed. It has to be carefully noted that so far, this simulation treatment has not considered any time component, which implies that the events and efforts in the past are equally weighted, as in case of the presently experienced cases. However, in general the organizers are observed to be more aware of the impact of the present events and experiences than those of the past. Therefore, $ACT - R$ is modified by using the functions to discount the impact of the past experiences by incorporating a power-decaying function, which is similar to the base-level financing equation. The modified formula for discounting successes and failures is given by:

$$S \text{ vs } F = \sum_{j=1}^m T_j^{-d} \quad (5),$$

Where m denotes the number of successes or failures, T_j denotes the time difference, and d denotes the success decay rate. The organizer uses this formula to give different decay rates for successes and failures. Hence, the manager has to improve the performance of the organization by optimizing various parameters, for which his experience is very important. For this work, his experience of interaction with the employees in the past, and his understanding of the market trends play an important role. In some complicated cases, use of software is also required, which is now commercially available. However, it is just possible that in certain cases, a sudden unforeseen event may take place, which may affect this situation, Eqn.(5) may be then modified as given below:

$$SvsF = \left\{ \sum_{j=1}^m T_j^{-d} - \phi \right\} \quad (6),$$

where ϕ denotes the effect of the sudden unforeseen event. It is important to note that in certain cases, it is possible to extend this analysis by including the individual experiences and memory of past experiences, and using a simple form of learning, based on the utility (U) function of $ACT - R$ given as:

$$U = \left\{ \frac{(1 + S)}{(1 + S + F)} \right\} \quad (7),$$

where each employee remembers his present score and adapts his strategy in the firm from time to time. It is obvious that at $T=0$, the individual has no preferences and hence makes the selection based on his experience or even randomly. However, in the $ACT - R$ simulation, the utility computation is quite complicated, and Noise (N) has to be added to compensate for the variance in decision making, and is given as:

$$U = \left[\left\{ \frac{(1 + S)}{(1 + S + F)} \right\} + N \right] \quad (8),$$

Also, in the simulation experiment, it has to be noted that the individuals are provided with an equal personal construct, which means that the initialization parameters of the employees are equal; implying that they have equal choices, equal utility-preferences, equal motivation value to solve the goals, and equal procedural, declarative memory and noise. However, if they have different values of these parameters, then the weighted average is taken in the computation. The weight implies the importance of each parameter in the final computation; and has to be taken into account to reach correct value.

4. Mathematical Model and Importance Of Utility in Financial Institution

The learning experience gained in the Financial program is extremely important for understanding the ins and outs of the field. The usefulness Utility of the program is a function, which can be given by the following expression.

$$\text{Utility} = f(\text{design, place, and phase}) \quad (9),$$

where design refers to the designs of financing, the place refers to the places where designers are held, and phase refers to the phases in which the designer actually unfolds. It is difficult to measure it numerically. In fact, its measurement requires the skill and experience of the expert in the field. It is important that this function should be maximized to get the optimum results. The designer has also to optimize the weightage to be given to each of these parameters, so that the optimum results are obtained.

$$\text{Utility} = f (. W_1 \text{ design, } W_2 \text{ place, and } W_3 \text{ .phase}) \quad (10),$$

where w_1 , w_2 , and w_3 are respectively the weightages of design, place, and phase.

5. Conclusion

It may be concluded that the Concepts, Services and Activities of Financing in Business Sector have to be well understood by the managers and financial advisors for the optimum profits and growth. This explains the attention being paid by the Academic institutions to impart the theoretical and experimental studies to the students undergoing such courses.

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