

Original Paper

Technical Overview of the Concepts of Finance Studies and the Methodology of Optimizing the Financial Resources of a Firm

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Abstract

The studies related to the financial concepts and various related sectors have been reviewed and discussed. Brief descriptions of Mathematical innovation, Avoiding taxes and regulation, and Role of Technology have been included for the purpose of optimizing the financial resources. The concept of Experimental finance and the importance of the Properly designed experiments to avoid likely problems have been analyzed. The Theory and the Methodology of Optimizing the Financial Resources of a Firm have been outlined for the benefit of the researchers. The paper is expected to be useful to the new entrants in the field and also for the senior financial advisors in the firms.

Keywords

financial innovation, avoiding taxes and regulation, role of technology, experimental finance, experiments for avoiding the likely problems, optimizing the financial resources of a firm

1. Introduction

One of the important concepts of Finance studies is the Financial innovation, which in short, refers to an act of creating new financial instruments in addition to the new financial technologies, institutions, and the related markets. A lot of interest has recently been shown in the financial innovations including hedge funds, private equity, retail-structured products, and exchange-traded funds. One of the important contributions in this direction has been in the shadow banking system, which has developed in the form of an array of financial innovations like the mortgage-backed securities products and collateralized debt obligations (CDOs). It is usual to categorize the Innovation in three types: institutional, product, and process. While the Institutional innovations imply the creation of novel types of financial companies like the specialist credit card firms including MBNA, discount broking firms like Charles Schwab, and more importantly internet banks; the Product innovation is related to the new products like derivatives,

securitized assets, and foreign currency mortgages; and the Process innovations refer to the novel ways of performing financial business, the important ingredients being online banking and telephone banking. It is really strange to note that while the economic theory provides much information about the existence and non existence of the types of securities, it gives no idea about the need of the existence of the new types of securities.

It is significant to note that the well known Modigliani-Miller theorem may be interpreted to know that the taxes and regulation are the main reasons for investors to be interested in the kinds of securities issued by the firms, e.g. debt, equity, or another type. As stated by this theorem, (i) the structure of a firm's liabilities should have no bearing on its net worth without taxes; and (ii) though the securities may trade at different prices depending on their composition, but finally they must add up to reach the same value. One of the other parameters in discussion is that there must be only little demand for certain types of securities. According to the well established capital asset pricing model developed by Jack L. Treynor and William F. Sharpe, the investors should completely diversify, and also their portfolios should be a combination of the market and a risk-free investment. The golden rule to follow is that the Investors with different risk/return goals must increase the ratio of the market return to the risk-free return in their respective jobs. However, this model has been criticized by many finance experts including Richard Roll, who argued that this model is not correct, since it is not possible for the investors to invest in the entire market. In simple terms, it means that there should be the requirement for the instruments, which provide new types of investment opportunities, because in a sense, this results in the investors getting closer to being able to invest in the entire market, though certainly not for instruments, which in fact merely the repackaged the existing risks, as the investors are already aware of the existing risks in their respective fields of work.

It is interesting to note that some economists argue that if we follow the Arrow-Debreu model, then there would hardly be any need for doing any financial innovation. This conclusion is on the basis of this model's assumption that the investors are interested in purchasing particular securities only if certain conditions are prevalent in the world at that point of time. The advantage for the Investors in this situation is that they can combine such securities to frame and create portfolios having payoff in which they are interested. It is useful to follow the fundamental theorem of finance, which states that the price of assembling such a portfolio is equal to its expected value based on the appropriate risk-neutral measure. Some of the earliest studies on this topic have been by Darrell and Rohit (1995) and Tufano (2003), who provided exhaustive and useful reviews of the related works. In fact, Darrell and Rohit (1995) have examined the utility and efficiency implications of financial innovation.

It has been explained on the basis of such reviews that the principal-agent problems, adverse selection, and information asymmetry result in the investors preferring some types of securities, like debt, over others like equity. Other important model in this field is by Myers and Majluf (1984), who developed an adverse selection model of equity issuance, according to which firms trying to maximize profits for the existing shareholders, decide to issue equity only if they are in a very desperate condition. The

finance advisors state that the firms prefer to finance investments from the retained earnings first, followed by debt, and finally by equity, since the investors are not prepared to trust any firm, which needs to issue equity. Allen and Douglas (1988) indigenized security issuance contingent on financial regulation, and particularly, enforcement of bans on short sales. They have reported that in such circumstances, the traditional split of cash flows between debt and equity is not optimal, and as a consequence of that, the state-contingent securities are given preference. Ross (1989) developed an interesting model, which states that the new financial products, in order to survive, have to overcome marketing and distribution costs. Another useful study is by Persons and Warther (1997), who discussed in detail the impact of the booms and busts connected with financial innovation. One of the recent papers on the subject is by Shiller (2008), who has dealt with some of the frustrations faced while creating a market for house price futures. Mendes-Da-Silva (2015) has discussed Financial Innovation as an expanding research field, in which its growth has been critically described.

2. Ingredients of the Market

The advent of the macroeconomic conditions forcing investors to be more aware of the need to hedge certain types of risk, led to some financial instrument becoming prominent. The Interest rate swaps were developed in 1980s, as a result of the skyrocketing of the interest rates. The dawn of 21st century, saw the development of the Credit default swaps after the recession beginning led to the highest corporate-bond default rate since the Great Depression.

2.1 Mathematical Innovation

The development of the Black–Scholes model in 1973, led to the Options markets experiencing explosive growth. The impact of the popularization of the copula technique was that the Collateralized debt obligations (CDOs) were heavily influenced (Li, 2000). This was followed by (i) the Flash trading, which came into existence in 2000 at the Chicago Board Options Exchange, and 2006 in the stock market; (ii) creation by Nasdaq and Bats Exchange, Inc of their own flash markets in early 2009; and (iii) Direct Edge becoming a U.S. Futures Exchange in 2010.

Very old concepts of futures, options, and many other types of derivatives have witnessed greatly increased use in the recent decades, along with the increased use of the mathematically complicated securitization techniques. Many financial experts believe that the mathematical formulas have been instrumental in bringing the change in the way that economic agents actually use, and fix the price of the assets. This has led to a strange characteristic of the economists, who are proactive in changing behavior by suggesting formulas, which let dispersed agents agree on prices for new assets (MacKenzie, 2008).

2.2 Role of Taxes and Government Regulation

It is established that taxes and government regulation in stimulating financial innovation are very important, and this was emphasized by Miller (1986), who stated that the role of taxes and government regulation in stimulating financial innovation is very important. It has to be understood that the Modigliani-Miller theorem explicitly considers taxes as a reason for deciding the preference of the

investor in choosing a particular type of security over another, in spite of the general rule that the corporations and investors should be indifferent to the capital structure in a fraction less environment. Interestingly, the development of checking accounts at U.S. banks done for avoiding punitive taxes on state bank notes, was an important part of the National Banking Act. A common practice followed by some investors is the use of the total return swaps to convert dividends into capital gains, being taxed at a lower rate. It has to be noted that many times, the regulators have been responsible for discouraging or even outlawing the trading in certain types of financial securities. In many countries, gambling is mostly illegal, and it is really difficult to know with certainty whether financial contracts are illegal gambling instruments or legitimate tools for investment and risk-sharing. The Commodity Futures Trading Commission (CFTC), the in-charge of making this determination, has been doing this job quite admirably. Melamed (1996) has described the difficulty faced by the Chicago Board of Trade while attempting to trade futures on stocks and stock indexes.

2.3 Role of Technology in Financial Innovation

It is now well known that improvements in computer and telecommunication technology have resulted in driving of some types of financial innovation. For example, as suggested by Paul Volcker, for most people, the creation of the ATM is a greater financial innovation than asset-backed securitization. In this connection, some other financial innovations affecting the payments system are the credit and debit cards, and also online payment systems including PayPal. The advantage of such innovations is that they are able to reduce transaction costs. In addition, they may also affect monetary policy by reducing real household balances. It has been noticed that with the increased popularity of online banking, households are able to keep greater percentages of their wealth in non-cash instruments. Goodhart (2000) and Woodford (2000) have made interesting studies, and have expressed confidence in the ability of a central bank to be successful in maintaining its policy goals by affecting the short-term interest rate in spite of the fact that the electronic money has eliminated the demand for central bank liabilities (Goodhart, 2000; Woodford, 2000).

It is an irony, that in spite of the positive impact of financial innovation, some well known financial experts choose to give little credit to it as far as any benefit to productivity is concerned. Paul Volcker stated that (i) there is little correlation between sophistication of a banking system and productivity growth, (ii) there is no neutral evidence that financial innovation has led to economic growth (Patrick & Suzy, 2009), and (iii) the financial innovation was a cause of the financial crisis of 2007-2010 (Tim, 2009). Not only this, even Krugman (2009) stated that the rapid growth in finance since 1980 has largely been a matter of rent-seeking, and not true productivity.

3. Goals of Experimental Finance in Human and Market Behavior

Experimental finance can in simple terms be described as a branch of experimental economics, and is mostly employed in the field of behavioral finance to understand its various aspects. Quite understandably, the goals of experimental finance are to understand human and market behavior with

proper relevance to finance. Such experiments are in the form of the synthetic economic environments created by researchers with an aim to satisfy the researchers with respect to their queries. This requires establishing different market settings and environments for observing and assessing experimentally and analyzing (i) the behavior of the agents and investors; and (ii) the resulting characteristics of trading flows, information diffusion and aggregation, price setting mechanism, and returns processes. It is interesting to note that such experimental methods have been applied to various fields including corporate finance, asset pricing, financial econometrics, international finance, personal financial decision-making, macro-finance, banking and financial intermediation, capital markets, risk management and insurance, derivatives, quantitative finance, corporate governance and compensation, investments, market mechanisms, SME and microfinance and entrepreneurial finance (Lucey, 2013). In fact, the researchers in experimental finance are engaged in studying the extent to which the existing financial economics theory makes valid predictions and attempts to suggest novel principles so that the theory can be evolved and extended.

Financial economics has real scientific value, and not surprisingly is available as one of the most detailed and updated observational data of all branches of economics. As a result, finance is just characterized by strong empirical traditions; which require carrying of lots of analysis on data from stock exchanges like bids, asks transaction prices, and volume of trade. In addition, some data is also available from information services on actions and events, which have great influence on the behavior of markets. However, the limitation is that the data from these sources is not in a position to report on the various expectations, which affect theory of financial markets. The underlying approach is simple as in the experimental market, the researcher has access to know the expectations, and thus is able to control fundamental values, trading institutions, and market parameters including available liquidity and the total stock of the asset. As a result, the researcher is able to know the price and the predictions of other related theories. This leads to the creation of the opportunity to do powerful tests on the robustness of theories which are not possible from field data, because of the limited knowledge on the parameters and expectations from field data (Shyam, 2007).

3.1 Advantages of the Experimental Finance

As is now clear, the financial data analysis is based on the data drawn from the settings created for a purpose different from finding an answer to a specific research question. This results in the situation where any interpretation of the results may not be convincing as it does not take into account the various other variables that have changed. It is important to note that the traditional data analysis has various issues including omitted-variables biases, self-selection biases, unobservable independent variables, and some unobservable dependent variables (Bloomfield & Anderson, 2010). However, the properly designed experiments are able to avoid several problems (Bloomfield & Anderson, 2010). In case of the omitted-variables bias, we have to note that the multiple experiments may be performed with settings differing from one another in exactly one independent variable. But, in this way, all other variables of the setting are controlled, which therefore, eliminates alternative explanations for observed differences in the

dependent variable. The case of self-selection is interesting as by randomly assigning subjects to different treatment groups, the experimenters avoid issues caused by self-selection, and are thus able to directly observe the changes in the dependent variable by changing certain independent variables. Unobservable independent variables are connected with the fact that the experimentalists can create their own experimental settings, which makes them able to observe all variables. However, the traditional data analysis in certain cases is not able to observe some variables, and sometimes experimenters also cannot directly get certain information from subjects. In case of the unobservable dependent variables, it may be observed that in traditional data studies, extracting the cause for the dependent variable to change is really difficult. However, the experimentalists are able to create certain tasks that help them to get information about the dependent variable.

There are many types of experiments, which can be mainly classified in three categories: Laboratory experiments, Controlled field studies or randomized field experiments, and Natural experiments. Obviously, the laboratory experiments are the most common type of experimentation, in which the idea is to construct a highly controlled setting in a laboratory (Bloomfield & Anderson, 2010). The growth of the field of the use of laboratory has mainly been due to the continuously increasing interest in the issues of economic cooperation, trust, and macroeconomics (Sauter, 2010), in which the treatment is fixed randomly to a group of individuals for comparing their economic actions and behavior to an untreated control group within the laboratory environment created artificially. It has been emphasized that the ability to control the variables in the experiment provides for more accurate assessment of causality (Bloomfield & Anderson, 2010).

In case of the controlled field experiments also, though the treatments are fixed randomly, but it is done so that it is close in the real world applications. Therefore, it is possible to estimate the average effects on the behavior of the public by comparing the behavior before and after the allocation, and that also quite consistently (Sauter, 2010). The happening of a natural experiment takes place when some feature of the real world is randomly changed, and thus results in allowing the use of the exogenous variation due to this change for studying the causal effects of an otherwise endogenous explanatory variable. Such experiments are commonly employed in the field of the economic and finance research, as they are instrumental in providing intuitive interpretation of the underlying assumptions, and also enabling a broader audience for checking their consistency, in comparison to the purely statistical identification (Sauter, 2010). These investigations on the basis of the experimental methods provide complementary methodologies, which make it possible to observe and manipulate the determinants of prices, like fundamental values or insider information. It has to be appreciated that the experimental studies in a way complement empirical work, especially in the area of theory testing and development. Such studies have revealed some important findings, which could not have been reached only on the basis of the traditional field data analysis, and are therefore considered as the main contributions to the field of finance (Shyam, 2007; Noussair, 2013).

It is important to mention here that though the Security markets can aggregate and disseminate

information, as there are efficient markets, but this process is less effective as the information becomes less widely held, and also, the number of information components to be aggregated increases.

4. The Working Group on Financial Markets

The Working Group on Financial Markets, and colloquially the Plunge Protection Team were created by Executive Order 12631 (Darrell & Rohit, 1995). The Working Group has three purposes and functions: (a) Recognizing the goals of enhancing the integrity, efficiency, orderliness, and competitiveness of our Nation's financial markets and maintaining investor confidence, the Working Group has to identify and consider: (i) the major issues raised by the numerous studies on the events in the financial markets surrounding October 19, 1987, and any of those recommendations that have the potential to achieve the goals noted above; and (ii) the actions, including governmental actions under existing laws and regulations (such as policy coordination and contingency planning), that are appropriate to carry out these recommendations; (b) The Working Group has to consult, as appropriate, with representatives of the various exchanges, clearing houses, self-regulatory bodies, and with major market participants to determine private sector solutions wherever possible; and (c) The Working Group has to report to the President initially within 60 days (and periodically thereafter) on its progress and, if appropriate, its views on any recommended legislative changes (Executive Orders, 2016; Plunge Protection Team, 1997).

It is important to note that the Working Group consists of: the Secretary of the Treasury, or his or her designee (as Chairperson of the Working Group); the Chairperson of the Board of Governors of the Federal Reserve System, or his or her designee; the Chairperson of the Securities and Exchange Commission, or his or her designee; and the Chairperson of the Commodity Futures Trading Commission, or his or her designee. Subsequently, "Plunge Protection Team" was made in February 1997, and has since become a colloquial term used by some mainstream publications to refer to the Working Group (Evans-Pritchard, 2006; Wachman & Observer, 2001).

4.1 International Finance

International finance, also referred to as international macroeconomics is the branch of financial economics mainly dealing with monetary and macroeconomic interrelations between two or more countries (Gandolfo, 2002; Pilbeam, 2006). Its main role is to examine the dynamics of the global financial system, international monetary systems, balance of payments, exchange rates, foreign direct investment, and the relation of these topics to international trade (Gandolfo, 2002; Pilbeam, 2006; Feenstra & Taylor, 2008). International finance is also concerned with matters of international financial management. It ensures that the investors and multinational corporations assess and manage international risks like political risk and foreign exchange risk, including transaction exposure, economic exposure, and translation exposure (Madura, 2007; Eun & Resnick, 2011). The international finance has major dimensions due to the fact that sovereign nations have the right and power to issue currencies, formulate

their own economic policies, impose taxes, and regulate movement of people, goods, and capital across their borders (Eun & Resnick, 2015).

4.2 Financial Planning

Financial planning is just the process of meeting life goals through a “big picture” approach to managing finances. In fact, comprehensive financial planning is based on integrated approach to monitor all aspects financial situation of the investor. The basic components of Financial Planning are: Insurance and Risk Management, Investment Planning, Tax Planning, Retirement Planning, Employee Benefits, and Estate Planning.

5. Results of Optimizing the Financial Resources

Optimizing the Financial Resources of a Firm is an important task of the financial experts, various techniques (Chopra, 2014; 2015; 2017) have been used recently for the optimization of Electronics Commerce and Predictive Analytics, the Efficient Performance of the Industry, the Management of Resources, Minimization of the Uncertainties in Business for the Optimum Performance of a Firm, and Administration’s Function, Process and Behavior. Such techniques can be applied for optimizing the financial resources of a firm.

It has to be understood that Financial Management has to take the responsibility to ensure the proper utilization of funds in a way that results in increasing the sum of the value and earnings of the firm. Thus, in a way, it is always required when the funds are involved. The Financial Management has two main objectives: Profit Maximization and Wealth Maximization. While the Profit Maximization refers to increasing the profit of the firm, the Wealth Maximization, is concerned with accelerating the worth of the entity. Clearly, the Profit maximization is the main objective of the concern, since the profit acts as a measure of the efficiency. However, the wealth maximization has the objective of increasing the value of the stakeholders. Economists always have conflicting ideas as to which one is more important, as there are significant differences between Profit Maximization and Wealth Maximization. Profit Maximization may in simple terms be defined as the capability of the firm in producing maximum output corresponding to the limited input, or it means that using minimum input for producing the required output, and in fact is termed as the most important objective of the firm. It is customary for the economists to recommend that the apparent motive of any business organization is to earn a profit, which is necessary for not only the success and survival of the company, but also for its growth. Though, the Profit is a long term objective, still it has a short-term perspective like concerning one financial year, which acts as guide and target for the coming year. Profit can be simply computed by deducting total cost from the total revenue. It is important to note that through profit maximization, a firm is able to ascertain the input-output levels, and therefore, it yields the highest amount of profit. Hence, the finance expert of an organization must take his decision in the direction of maximizing profit although it is not the only objective of the company.

One of the useful and well established models for profit maximization is the projection model for market share or sales, based on tracing the percentage of triers who become first-time users, second-time users,

and continue to do so. It is customary to term the triers or repeat users who discontinue the use, as the non-users. If it is assumed that the triers have a constant average purchase rate TU , which is different from that of the repeaters having use rate RU , then the total sales per potential trier (Chopra, 2017) are then given by:

$$TS_t = \{T_t - T_{(t-1)}\}TU + \sum_{i=1}^{(t-1)} UC_{t,i}RU \quad (1)$$

where TS_t denotes the total sales per potential trier during period t , T_t denotes the new triers during period t , TU denotes the trial-use rate, RU denotes the repeat-use rate, and $UC_{i,t}$ denotes the percentage of new triers in period i , who continue to be the users during the period t . It is clear that $UC_{i,t}$ can be computed by using a depth-of-repeat model, and for simplifying the computations, it is assumed that

$$UC_{(t-i),t} = r\{T_t - T_{(t-1)}\} \quad (2)$$

which clearly means that the percentage (r) of triers repeating at least once, is independent of

time. Also, if $Finance_i$ is the amount of finance i , and t_i is time in reaching it, then

$Finance_i$ is a function of t_i i.e.

$$Finance_i = F_i(t_i) \quad (3)$$

and

$$\frac{F_i(t_i)}{dt_i} > 0 \quad (4)$$

i.e., $Finance_i$, $F_i(t_i)$, is an increasing function of t_i , which clearly is based on the effort of the financial expert, and can be easily connected.

The methodology for maximizing the finances of a firm is based on carrying out many steps; It has to be visualized that the Maximization of renewable resources consumption, minimization of production costs and energy costs, are conveniently approached by means of linear programming (Bucur & Boncut, 2007) as represented by the function fDDOI. In addition, the equilibrium condition provides the

maximum total output for the two markets together. To derive this, we have to note that for a fixed number of departments N , we can take $N_j = (N - N_i)$, and therefore the sum of the outputs is given (Chopra, 2017) by:

$$Q_i + Q_j = \left[a_i \frac{N_i - 1}{N_i} + a_j \frac{N - N_i - 1}{N - N_i} \right] / \beta \quad (5)$$

where α s denote the fixed costs, β s denote the variable costs, both being identical for the departments.

As stated above, the Wealth maximization is the ability of the firm to increase the market value of its total stocks with the passage of time, which is based on many factors including their goodwill, sales, services, and quality of products. The economists agree on one point that the fundamental goal of the business firm is to increase the wealth of its shareholders, as they are in fact the owners of the undertaking, and buy these shares with the expectation of getting some return after a period. Hence the financial expert has to take the financial decisions of the firm in such a manner that these increase the Net Present Worth of the company's profit. Clearly, this value is based on two factors: Rate of Earning per share, and Capitalization Rate.

The economists believe that the Profit Maximization and Wealth Maximization are quite contradictory. It is difficult to decide as to which one is better, but it can be ascertained as to which one is more important for a firm. Profit is the basic requirement of any entity. Otherwise, it may lose its capital and may not be able to survive in the long run. But, as we all know, the risk is always associated with profit or in the simple language profit is directly proportional to risk and higher the profit, higher is the risk involved with it. So, for gaining the larger amount of profit a finance manager has to take such a decision which is expected to give a boost to the profitability of the enterprise. Though, in the short run, the risk factor may be neglected, but in the long-term, it is not possible for the entity to ignore the uncertainty. It is true that the shareholders invest their money in the company with the hope of getting good returns, and if they do not see that anything is being done to increase their wealth, they will choose to invest in some other company. Also, in case, they feel that the finance manager is taking reckless decisions involving risky investments, they will lose their trust in that company, and sell their shares of that company, which will adversely effect on the reputation of the company, and ultimately lead to the greatly falling the market value of the shares. Hence, it can be safely concluded that for day to day decision making, Profit Maximization has to be taken into consideration as a sole parameter; but for the decisions which directly affect the interest of the shareholders, Wealth Maximization becomes more important.

5.1 Minimizing the Taxes

The taxes on the finances have to be minimized by investing in various tax saving schemes e.g. securities and infrastructure etc, and also choosing the firms for investment which give tax exemption

for a large period of time. In this way, the financial expert is able to achieve Tax_{min} ,

5.2 Maximization of Finances

$Finance_{max}$ is reached by adding algebraically the total sales, costs, and taxes to the *Finance* and then comparing it with the existing *Finance*. The process has to be repeated a number of times for a large number of permutations. The accuracy of the technique depends on the volume of computations. This requires the skill and experience of the finance expert, and more importantly the use of commercially available software.

6. Discussion

The maximization of financial resources has to be done by considering various factors and parameters. The good thing nowadays is that there are many personal finance experts to learn from e.g. Dave Ramsey has been very successful in helping people to live a debt-free life, while Chris Hogan has been able to provide a large number of useful tips and tricks for planning of retired life. Apart from these, following Grant Cardone helps people in significantly increasing their monthly income, and Peter Schiff's podcast can be greatly useful for those looking to have a better understanding of the happenings in the economy. Thus, it is becoming clear that a lot of growth of interest is being shown in taking steps by the experts in making available their expertise for the betterment of the society.

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