

Creating optimum portfolio in effective financial markets

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Abstract: In this article, a mathematical model of the effective financial market in which an investor behaves rationally has been looked through in this regard. In this model, a rational behavior is characterized by each investor to have the optimum portfolio. Thus, there are not any opportunities for the arbitration since the prices of financial instruments are fair in this regard.

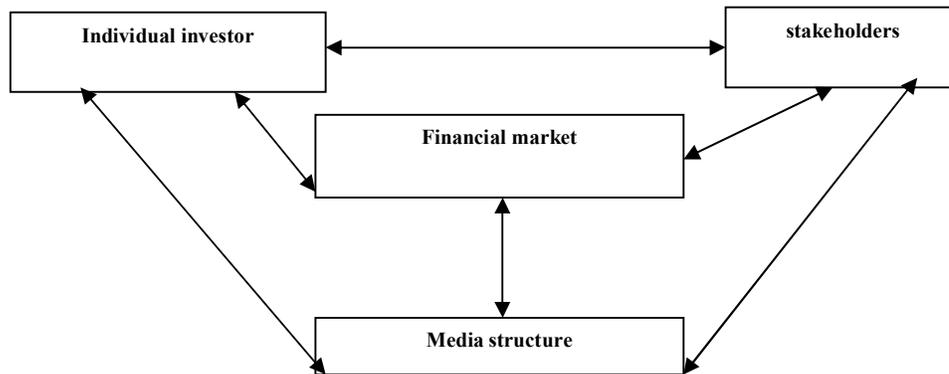
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Introduction:

A comprehensive definition of the investment is subjected to the results of capital and increasing financial media and market and this structure may be operative due to a series of operational system. The majority of these operations

are related to the financial markets and absorbing these structural operations. Fulfilling these operations and sharing in the related operations have been designed in the following diagram along with structures and financial market.



In this diagram, it is observed that in an economical operation, the financial market has an effective establishment and this status totally indicates the economical analysis:

The root of economical market and its management has been centralized into the core of the issue. In this diagram, the structures have been described separately as following:

Individual investor:

The mathematical-economical model of the financial activity has been given as an ideal form and achieving any issues related to the main topic is being matched in this regard. For the reason, according to Neman-Morgan theory, the individual investor should be led to the suitable and acceptable

approaches or based on another quantity trying to solve the optimized issues.

Companies:

The possession of a person along with private territory such as factory, automobile, and any financial operations being belonged to the same one and evolving his activity with earning the process optimized and having other shares and call options.

Media structures:

These structures include the whole investment companies, banks, and different companies along with sale prices and the related company's structures as well.

Financial market features:

A financial market is a market where the process of sale and purchase is being achieved through the banking papers accordance with pricings and commodities prices as well; the related paper of these commodities is being fulfilled by the financial operations and the role of these mentioned media.

The tools of financial system have been divided into two groups as following:

Types of basic financial systems:

- A-bank account
- B-shares
- C-call options

Types of effective financial system:

- A-options
- B-future agreements
- C-warranties
- D-swaps
- E-combinations
- F-distributions
- G-interactions

The first group is subjected to the financial issues and benefits which they are never related to the Capital but the second group has been devoted to the Capital financial issues as financial operation and speculative security and or the related services in this regard.

In uncertain conditions, the most financial operations are not evolved with complete results in this case; for the reason, in order to analysis the financial market, certain hypotheses are required in relation to the market; for the analysis of the financial market, three hypotheses have been established as following:

1-the features of " the lack of prevention" which are profitable for the stakeholders are needed for the market shares.

2-in uncertain conditions, the possibility of earning the market conditions and making the necessary foundation as optimized and or seeking possible circumstances leading to the construction of the market are necessarily required in this regard. The confirmation of the theory that the market behavior should be based on the possible analysis and mathematical approach have been needed and matched in the process as well.

3-in order to analysis the financial market prices and their random changes, global literature and the recent information as well as a certain character about the quantity of the accounts should be applied in this process.

There have been formed different models of financial markets about these three important hypotheses as following:

Effective financial market model:

It appears as a logical form; in other words, 1-making the process of pricing at the market, 2-to change the external conditions, the pricing issue is being changed and then, the same pricing process is being formed as " fair" after a short period of a time. 3-the whole stakeholders in the market accept the informational conditions in a cohesive form and they also admit any changes in this case. 4-every stakeholder is seeking to his personal profits where he is making the related business there.

Creating an effective market according to the pricing portfolio does not include the other changes; in this kind of the market, the mathematical model is evolved and the movement theory is an essential factor in the related model.

Ideal financial market operation:

In this market, an optimized portfolio structure causes to the iteration of the market structure; that is, the intangible operation of speculative security can be achieved in this case; this method is subjected to the same result of Tobin portfolio model analysis. Now, let's look at to one of these financial market models.

Let's consider K_i as each i -ci investor, k_{01} as capital, x_{10} speculative security pricing list, x_{0y} the net speculative security as j -ci.

($j=1, n$). If j -ci is not to be the speculative security, d_j , then, $k_{01} = x_{i0} + \sum_{j=1}^n x_{y0} d_j$

If the random quantity is G in the effective market, and the general degree of capital is K , then each investor i -ci gets the evaluation list of speculative security as following:

$$U(KG) = KG - R_1(KG - Kmp) \quad 2,$$

$$Mp = M(g)$$

The maximum of the mathematical limit can be governed in this portfolio. Here, R_j is related to each investor's speculative security as the same type of an ideal character of M mathematical limit in this regard. This speculative security of the portfolio is subjected to the same d^* as the quantity which are equal together. If the investor i -ci achieves the speculative security analysis at the beginning of his capital x_{10} , then the capital period gets as following:

$$K_{i1} = x_{i0} k_{i0} (1+r_0) + (1-x_{i0}) k_{j0} (1+d^*)$$

This capital becomes in the expected limit:

$$F_i(x_{i0}) = M(u, (k_{i0}d)) = x_{i0}k_{i0}r_0 + (1-x_{i0}) k_{i0}m^* - R_i(1-x_{i0})^2 (k_{i0})^2 D^*$$

$$\text{Here, } m^* = M(d^*), D^* = D(d^*)$$

Now, $f_i(x_i)$ the maximum quadratic of the price equals to x_{i0} and pricing $f_{i1}(x_{i0})=0$ is governed as following:

$$X_{i0}^* = 1 - m^* / R_i K_{i0} D^*$$

Now the whole investors and their portfolio get into speculative security:

$$\sum_{i=1}^n n(1 - x_{i0}^*) k_{i0} = m^* - r_0 / 2D^* \sum_{i=1}^n n 1/R_i$$

Which the capital gets governed.

Therefore, it can be stated that in the balanced way, speculative security pricing gets balanced again in the market.

Based on the equations 1 and 2, we can rewrite :

$$M = M(d) = m^*$$

$$M_j = M(d_j) = M(d_{ij}) / d_{bj}$$

$$D = D(d^*) = 1 / (d_0)^2 \quad D(D^*) = D^*$$

$$B_j = \text{cov}(d_j, c) / D = d_0 \text{cov}(d_{ij}, d_1) / d_0 j D(d_1)$$

According to these equations, equation 1 and α get changed as following:

$$D_0 = 1 / (1 + r_0) (M(d_1) - 2D(d_1) / \sum_{i=1}^n n R_i - 1)$$

For making fair pricing, we have:

$$D_{i0} = 1 / (1 + r_0) (M(d_{i1}) - 2 / \text{cov}(d_{ij}, d_1) / \sum_{i=1}^n n R_i - 1)$$

Thus, the process of pricing gets in a balanced way in the market.

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