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Behavior Model of the Producer who Believes in Life After Death: A Mathematical and Geometric Approach

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Abstract

Producer behavior is one of the important theoretical challenges in the field of religion effect on the economy. In this field, theories have been presented. But these theories also have shortcomings. Belief in the afterlife effects on producer's behavior, this article attempts to analyze and to explain the effect of belief in life after death and satisfaction in that life on the producer's behavior by recalling the producer's motivation and goal and giving it a framework compatible with religion. This article is in the framework of theorizing and its analysis method is the method of logic along with mathematical and geometrical analysis. Among the findings of this study is the explanation of the effect of religious beliefs on producer behavior, how to determine the balance, the optimal size of production on the producer's productive behavior with mathematical and geometrical methods. The main innovation of this paper is to present a theory on the behavior of the faithful producer. In addition, a special innovation of this paper is to present mathematical and geometric analyses in explaining the behavior of the faithful producer.

Keywords: Producer, Life after death, Islamic economy, Behavior, Production

GEL Class: D21 ،Z12

Introduction

Among economic behaviors, production behaviors have a high position. Production is one of the foundations of economy and development of countries, which is also given a special place in religion. Production has started since the beginning of the economic life of man. Based importance of the phenomenon, economists have also given theories about production. Many writings are available in this field, but there are few writings that can provide a systematic and integrated framework that covers all producer behaviors. Studies in the field of the theory of producer behavior have addressed this issue from various perspectives and good progress has been made in this field. In this field, there are several points that have caused these theories and models to not be able to justify the producer's behavior in various fields.

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Basic point is that in the traditional views, for the producer, one or a period of time is seen as life in this world, and life after death is left aside for him. This has caused theories to become ineffective and unable to analyze many behaviors influenced by religion and behaviors that are done for God and with the aim of providing a better life for after death.

Another point is that most of these writings are not based on the motivation. Because if the motivation is not an internal and intrinsic factor, it cannot be the same for different people, and a comprehensive theory cannot be given based on it. This point leads to the wrong way and makes the theory problematic. Most of these reviews are based on the profit motive and other motives are also given. First, it should be said that if the motivations are multiple, it may create contradictions within the person and the person will not be able to create a balance between them, as a result, the balance will not be established, and secondly, multiple motivations create multiple goals, and if these multiple goals are not of the same type, it cannot be included in the model and we are forced to make illogical assumptions. As can be seen, for this reason, in the targeting of diversified models, part of the producer's goals, such as personal profit and increasing society's production or personal profit and social welfare, are included in the model. If a single motivation can be presented for all the producer's behavior, his behavior can be better analyzed.

The third point in this context is that in some existing models, the expendable asset is not specified precisely, and as a result, this asset cannot be spent for all purposes. In this situation, the presented models have shown more special situations than they can show the balance of everyone's behavior and are correct for all situations of decision making.

In this article, an attempt is made to analyze the belief to life after death and the satisfaction obtained from expenditure in the way of God in life after death by presenting a systematic framework of the producer's motivation and purpose. The productive behaviors under the influence of the belief in life after death should be explained. In this article, the behavioral equilibrium of the producer is explained along with how to reach it in a mathematical and graphical form. At the beginning of this article, we define some words that we are dealing with here.

Cost in the way of God: The value of money that someone pays in the way of God, or the expenditure someone has in the way of God, or the money that he gives up receiving and earning in the way of God, or the like. We say the cost is in the way of God. For ordinary people, this value is spent to obtain the reward that comes to them from God.

Satisfaction of cost in the way of God: When someone pays money or expenditure in the way of God, or gives up receiving money and earning it for God, he hopes that

God will reward him in the world after death or even reward in this world. Achieving this reward gives him satisfaction or utility. But he will get this reward in the life after death and he will be satisfied at that time. He includes this satisfaction in his decision today. But according to the confidence that he has about the world after death and the occurrence of what he knows and has been told to him and he has accepted. This assurance is faith.

Cost in the way of God in the production process: The money or the monetary value of cost that the producer pays in the process of production in the way of God, or the revenue and profit that he gives up receiving and obtaining in the way of God, and or like that, we say cost in the way of God in the production process. For ordinary people, this value is spent to obtain the reward that comes to them from God.

Profit: Production revenue minus production cost is called profit.

Maximum profit: If the producer sets his only goal in the production process to obtain monetary profit, he can obtain it in the maximum amount, we say maximum profit or maximum profit of the producer.

Remainder of profit: When the producer has a cost in the way of God in the production process that is not in line with the goal of profit maximization, a part of his profit is reduced. What is deducted from the profit is deducted from the maximum profit. What the producer obtains in the production process in the framework of monetary and accounting profit, we call remainder of profit.

Monetary revenue of production: The sum of the revenues that the producer obtains from the sale of his production goods and services or remainder from production and its process and must be included in the accounts, we call sales or monetary revenue 0f production.

Marginal monetary revenue of production: the monetary revenue that the producer obtains from the last unit of his production (sale) goods and services and must be included in the accounts, we call the marginal monetary revenue of production.

Average monetary revenue of production: average monetary revenue of production based on production or simply speaking, we call the total monetary revenue of production divided by the number of productions as the average monetary revenue of production.

Monetary value equivalent of the satisfaction of cost in the way of God: When the producer spends in the way of God in the production process, he hopes that God will reward him in the world after death or even in this world. This reward is satisfying for the producer. The monetary value equivalent to this satisfaction from the producer's point of view, or in other words, the money that this producer is ready to receive in

order to lose that satisfaction, we call the monetary value equivalent to the satisfaction of the cost in the way of God.

Marginal monetary value equivalent to the satisfaction of the cost in the way of God: the monetary value equivalent to the satisfaction of the cost in the way of God, which the producer has for the last unit of production, is called the marginal monetary value equivalent to the satisfaction of the cost in the way of God.

Real revenue of production: The total monetary revenue of production plus the monetary value equivalent of satisfaction of the cost in the way of God in the production process is called the real revenue of production.

Marginal real revenue of production: the sum of the marginal monetary revenue of production plus the marginal monetary value equivalent of satisfaction of the cost in the way of God in the production process is called the marginal real revenue of production.

Average real revenue of production: Average real revenue of production based on production or in simple words, real revenue of production divided by the number of productions is called average real revenue of production.

Monetary profit of production: We call the total monetary revenue of production minus the total cost of production as monetary profit of production.

Real profit of production: The real revenue of production minus the total cost of production is called the real profit of production.

The marginal real profit of production: the marginal real revenue of production minus the marginal cost of production is called the marginal real profit of production.

Average real profit of production: Average real profit of production based on production or in simple words, real profit of production divided by number of productions is called average real profit of production.

Literature review

The views on the behavior of Muslim producers can be divided into two parts. Some of the viewpoints have addressed the motive and goal of the producer and the bases of his behavior, and some have tried to present the behavioral model of the producer in a framework compatible with Islam. We refer to these two parts of views. There are different views on the motivation and goal of the producer. Some thinkers have considered profit as the main motivation of the Muslim producer. In some ways, they have proposed other incentives besides profit for the producer. With this motive, in these views, the basic goal of the Muslim producer is to create profit. Examples of these thinkers are (Arief 1982; Ariff 1997; Dar 1988; Iqbal 1992; Al-Ba'ali 2000; Mir Moezi, 1382; Al-Mesri 2001; Amin & Yusof 2003; 2007). Some Muslim economists,

by accepting the profit motive for the Muslim producer, have accepted the goal of establishing profit for him within the framework of limits. Like (Siddiqi 1982; Naqvi 1981; Hasan 1992; 2008). Some Muslim thinkers, looking at the fact that the motivation of a Muslim is not personal material, state that the Muslim producer is trying to create benefits for the community. On this basis, they see his goal in more production realized (Ali 1980; Faruqi 1983; Manan 1992; Akhtar 1993).

Some Muslim experts express the motivation of the Muslim producer as multiple, and in this regard, profit is one of them. These thinkers are different in terms of raising other motives. Also, they have considered the subject differently in the goal (Siddiqi 1992; Gusau 1988; Bendjilali & Taher 1990; Metwally 1992; 1997; Martan 1992; Mir Moezi 1382; Abbas 1995; Hallaq 1995; Naqvi 1997; Hasan 2008). In addition to these, some Muslim economists have stated that the motivation of the Muslim producer is to gain utility and his goal is to maximize utility in this world. These experts have differences with each other in terms of expressing the factors that create usefulness. But in general, in their final statement, they propose a similar model (Kahf 1978; Gusau 1988; Bendjilali & Taher 1990; Metwally 1992; 1997; Safar 1995; Hallaq 1995)

Some experts have expressed the optimization of behavior in the form of qualitative concepts of compliance with Islamic rules, such as the prohibition of usury, justice, prohibition of all types of fraud, preservation of Islamic values, and the like. It is very difficult to provide a model to achieve such goals. For this reason, no model has been presented in this field. However, in the field of objectives such as profit maximization and utility, models have been presented that we will review.

Bendjilali and Tahir (1990) argue that the Muslim producer has two main motives: one is to earn profit and the other is to increase social welfare, both of which create utility for him. Based on this, one goal of the Muslim producer is to maximize profit and his other goal is to maximize social welfare. His utility is subject to these two goals. Based on this, the Muslim producer's utility function is as follows:

(1) $$U = U(\pi, W)$$

where U is utility, producer's profit function and W is social welfare function. According to his opinion, social welfare can be seen as a function of the amount of production (Q). In this case, we can write:

(2) $$U = U(\pi, Q)$$

Like normal goods, it is assumed that the marginal utility and Q are positive, their second partial derivative and their cross partial derivative are also positive. For the profit function of the producer, the common function is considered, that is:

(3) $$\pi = TR(Q) - TC(Q)$$

On this basis, the objective of the Muslim producer will be:

(4) $$Max: U = U(\pi, Q)$$
$$S..to: \pi = TR(Q) - TC(Q)$$

The problem is solved by Kan-Tucker conditions and the optimal relationship is as follows:

(5) $$MRS_{Q\pi} = MC - MR$$
$$\pi = TR(Q) - TC(Q) \quad \text{And}$$

(6) $$MRS_{Q\pi} = P - P - PQ = PQ_e$$

According to this condition, the Muslim firm produces between these two amounts. That is, we have:

(7) $$0 < MRS_{Q\pi} < -P(Q_e)Q_e$$

They show that the conditions of the second order or sufficient optimization also exist.

In the article Behavioral Model of the Islamic Firm (1992), Metwally presents a model for maximizing utility, in which the utility of the producer is a function of the amount of profit (F) and the costs paid for charity (G), that is:

(8) $$y = y(F, G)$$

He defines a variable called real profit (M), which is the result of subtracting the total cost (C) and the expenses of charity and public benefit (G) from the total revenue (R), that is:

(9) $$M = R - C - G$$

where total revenue and total cost are function of production quantity (q) as follows:

(10) R=pq

(11) C=C(q)

The demand function is common and increasing the payment of charity by the firm causes the demand curve to move up. The relationship between profit level and real profit (M) is as follows:

(12) F=M-Z-U

where Z is the amount of zakat (tax) on profit and U is an additional payment of profit. Assuming that the rate of zakat on profit is μ and the rate of other additional payments is on profit, we will have

(13) $$Z = \mu M = \mu(R - C - G)$$

(14) $U = \beta M = \beta(R - C - G)$

By inserting relations (14) and (13) into relations (12) and (9), we will have.

(15) $F = (1 - \mu - \beta)(R - C - G)$

In sequential terms, this function will be the objective function of the Muslim producer, but he has an important condition, which is the minimum acceptable profit for the owners. In this case, the goal of the Muslim producer will be as follows.

(16) Max: Y=Y (F, G) F= f (q), G=g(q)

(17) S. t.: $-F\ \phi = \pi - F \leq 0$

This relationship will be resolved with Kan-Tucker's conditions, and the necessary condition is the same as the usual condition of monopoly:

(18) MR=MC

in which we have:

(19) $\frac{\partial R}{\partial G} = 1 - \frac{Y_G}{Y_F}\frac{1}{(1-\mu-\beta)}$

He proves that the condition of Kan-Tucker's second order is also met.

Safar (1995, 74-89) also accepted the sequential model and brought its equilibrium conditions with the nonlinear programming method.

Hallaq (1995) combines the models of Bendjilali and Taher (1990) and Metwally (1992). Like Bendjilali and Taher, he considers the utility of the Muslim producer as a function of profit and the amount of production, and considers social welfare as a direct function of production. He states that in addition, a Muslim producer spends part of his profit in the way of God. This point is the same thing that has been presented in his model. In Hallaq's model, in particular, the expenses in God's way are a ratio of that is, we have

(20) $G = \alpha\pi$

where G is expenses in the way of God, profit and the ratio of expenses in the way of God to profit. Based on the Hallaq model, the Muslim producer maximizes his utility function, which is written as follows:

(12) $U = U(\pi, W)$

where W=w(q). So instead of W in the model, q is used and the objective function of the producer becomes Muslim:

(22) Max: U $=$ U $(\pi_{,q})$

(23) $\text{S.t: } \pi = R(q) - C(q) - G$

Maximization is done by using Kan-Tucker's conditions. Here too, since it is considered, we will have:

(24) $\pi = (1 - \alpha)(R(q) - C(q))$

Based on this, the first condition will be MR=MC (only by including the sum of new costs). The second order (sufficient) condition is also obtained according to the common method.

Amin and Yusof (2003) accept profit with expediency as the basis of maximization. In the model presented by him, the primary profit function is written as follows:

(25) $\pi = \pi(q) = R(q) - C(q)$

In that profit, R is the total revenue, C is the total cost, and q is the total amount of production, and the total revenue is obtained as follows:

(26) $R(q) = P(q) \times q$

where p is the price. The cost is as follows:

(27) $C = E(q) + Ic(q)$

E(q) is the implicit costs and Ic(q) is the obvious/opportunity costs according to traditional economic theory and Ic(0) = 0. The opportunity cost in Islamic economics is as follows:

(28) $I_S = I_S(q) = \alpha(q) + I_c(q)$

In that, the function of the opportunity cost of goods is based on Islamic expediency and is considered. It is positive for essential goods with production, but for the production of non-essential goods, the society needs to produce another essential good and the producer can replace its production. On this basis, for essential goods in any production quantity, we have:

(29) $I_S(q) < I_c(q).$

For essential goods, the equilibrium production quantity (q_S) is greater than the equilibrium production quantity in traditional economic theory (q_s^e). But for a non-essential good that has an essential substitute, q_s^e is less than q_c^e. Maximization of the Muslim producer is done with the following equation:

(30) $\pi(q) = R(q) - [E(q) + I_c(q) + \alpha(q)]$

which will be a necessary condition for balance:

(31) $$R^{'}(q^{e}) = E^{'}(q^{e}) + I_{c}^{'}(q^{e}) + \alpha^{'}(q^{e}).$$

Based on the Kan-Tucker's conditions, the maximum point is lit.

In their other article, Amin and Yusof (2007), these two emphasized the superiority of this model due to its simplicity and ease of use.

Ezzati (2009) considers the goal and motivation of the producer to be the maximization of life satisfaction (utility) in two worlds and based on this, he gives a model to show how the decision of the producer is made, in which he talks about the goal and motivation, He writes: If we look realistically at the motive and purpose of man, we cannot say that his motive can be outside of him. If his motivation is not intrinsic, it cannot be permanent and it cannot be the same for any human being. Motivation must be internal and sustainable. Man is his own lover. We accept here that man seeks to achieve satisfaction for all his actions. The motivation with which the Qur'an has also encouraged people to do kindness. The goal of man in all his actions such as consumption and production is to maximize the satisfaction of life in this world and life after death. Based on this, profit maximization and the like are not the ultimate goal of man, profit has no value unless it can satisfy needs. On the other hand, or in more general terms, unless it gives satisfaction (utility). The fact is that if a person achieves more satisfaction without this profit than using the money of that profit, he sacrifices the profit for this satisfaction. Targeting profit is only a simplification for analysis and has no other value, and it is much better to consider a more comprehensive goal for the producer that can analyze all the mentioned goals together. On this basis, we realize the more comprehensive motivation and goal, that is, achieving satisfaction for the life of this world and the life after death and maximizing it.

Based on Ezzati (2009), it can be said that the producer is faced with a large number of worldly and otherworldly contentment components, which adjusts their total in such a way as to obtain the maximum expected contentment according to the total conditions and requirements. The most important components of afterlife satisfaction (utility) resulting from the producer's activity can be listed as follows. Afterlife satisfaction (utility) resulting from:

Increasing personal work (work is worship) (A_1)

Increasing community production (A_2)

Increasing supply and creating abundance of goods and services in society (A_3)

Creating employment (A_4)

Helping people's revenue (A_5)

Helping the economic and social development of society (A_6)

Helping society's independence (A_7)

Helping workers with pay wages (A_8)

Helping producers of raw materials through increased transparency (A_9)

More financial support through firm fees to workers (A_{10})

Helping raw material producers in other ways such as favorable payment terms and other support (A_{11})

Leaving an inheritance for children (heirs) (A_{12})

Any other type of assistance to the society and its people through the firm's activity or reinvestment of the profit from its activity (A_{13})

Using profits to pay all kinds of religious expenses (A_{14})

Of course, each of these actions at any point in time may have a different reward in the afterlife and, as a result, possible satisfaction according to individual and social conditions. Also, according to his conditions and especially his faith level, the Muslim producer will be satisfied by obtaining the conditions of deserving a certain amount (specified for himself) of the possible satisfaction of the hereafter. Based on this, it can be said that according to the existing conditions, the producer can obtain the sum of possible satisfaction expected in the afterlife (assuming the independence of these satisfactions from each other) from the following function:

(33) $$U_a = \propto_1 A_1 + \propto_2 A_2 + \propto_3 A_3 + \propto_4 A_4 + \propto_5 A_5 + \propto_6 A_6 + \propto_7 A_7 + \propto_8 A_8 + \propto_9 A_9 + \propto_{10} A_{10} + \propto_{11} A_{11} + \propto_{12} A_{12} + \propto_{13} A_{13} + \propto_{14} A_{14}$$

Or $$U_d = f(A_i)$$

where U_a is the sum of possible afterlife expected satisfaction (utility) for the individual, letters A_i are the amount of performing each action according to the above list and αs are coefficients of expected satisfaction resulting from each unit of each of the actions.

In this case, the most important components of satisfaction in this world resulting from the activity of the producer can be listed as follows. This worldly satisfaction from:

Increase in revenue and wealth (D_1)

Improving social status (D_2)

and like these (D_3)

However, the most important central element in this context is the profit that provides this satisfaction (utility). It is on this basis that in the traditional economic theory, the goal of profit maximization is placed. In this case, it can be said that the worldly

satisfaction of a person according to his conditions and desires (assuming the independence of these satisfactions from each other) is the result of the following function:

(33) $U_d = \beta_1 D_1 + \beta_2 D_2 + \beta_3 D_3$

Or $U_d = f(D_i)$

Where U_d is the sum of a person's expected satisfaction for life after death, D_i symbols are the measure of achieving each of the above three goals, and βs are the coefficients of satisfaction obtained from each unit of achieving the goals (each It results from the 4 mentioned goals. To simplify the analysis in the traditional theory of economics, the sum of it - ignoring some points - is taken as the result of profit (π).

Based on this, it can be said that the Muslim producer has a satisfaction function in the production activity, which is obtained from the sum of the above satisfactions and the following function.

(34) $U_T=U(A_i, D_i)$

By examining these views, it can be said that each of the thinkers have taken a special state for the producer and analyzed it. But it should be better to know a point of view that can show all the states in one place. Ezzati's view (2009, 35-62) can be considered as a more universal framework for analyzing producer behavior, which includes both Muslims and non-Muslims, both with little faith and religiosity and with more faith and religiosity. We accept this model and framework, and based on it, we try to analyze the producer's behavior mathematically and geometrically, and obtain the optimal point of production in various assumptions.

One point in the theoretical discussion presented by Ezzati (2009) is the existence of expected utility, this that explained in Ezzati (2003). In this article, we assume that utility is deterministic.

Producer optimal

Here, we review Ezzati's model (2009) and show how to achieve balance based on it. After that, we analyze the optimal point of the product. We said that the producer is faced with a possible (opportunity) revenue. This possible revenue is the maximum economic profit that the firm can earn according to traditional economic theory. This opportunity profit will cost producer to live in this world and in afterlife. According to the conditions of the society and the producer himself, his production size will be more or less at the point of maximum profit. In this situation, his objective function can be written as:

(35) Max: $U_T=U(D_i, A_i)$

where U_T is the function of the satisfaction (utility) of the person, D_i is the remainder of profit for the person's cost of life in this world (the cost to achieve satisfaction for the sake of life in this world) and A_i is the cost of the opportunity profit to achieve satisfaction for the life after death and it means profit that the producer directly spends to achieve satisfaction in the life after death, or by ignoring it in the production process, he seeks to achieve satisfaction in the life after death. As mentioned, the producer allocates his maximum possible profit to achieve these two satisfactions. Based on this, what he has (opportunity wealth) and can spend to achieve the satisfaction of his life in this world and his life after death, this is the maximum profit based on the traditional economic theory, which we denote by mπ.

(36) $$Max: m\pi = TR(q) - TC(q)$$

which we denote by mπ. On this basis, it can be considered as a person's property for spending, which is used as an adverb in a person's decision making:

(37) $$m\pi = D + A$$

where mπ is the maximum possible profit (equal to what we have seen in traditional economic theory), A is the opportunity profit allocates to achieve satisfaction in life after death and D is the remainder of profit for the person's expenses of this life (achieving satisfaction) is the reason in the life of this world). We take these two on the basis of the currency unit, which increases the power of analysis and the number of possible options in the choice of the producer, to simplify the space of scientific analysis. Also, this way of considering the adverb by simplifying the model increases its applicability. This function will be solved with the mentioned condition through Kan-Tucker's conditions and by solving it by moving from the end to the beginning, the point of production will be obtained. Based on this, we will have:

(38) $$L = U(D\ , A) + \lambda(m\pi - D - A)$$

(39) $$L = U(D\ , A) + \lambda(m\pi - D - A)$$

(40) $$\frac{\partial L}{\partial \mathrm{D}} = U'_D - \lambda = 0$$

(41) $$\frac{\partial \mathrm{L}}{\partial \mathrm{A}} = U'_A - \lambda = 0$$

(42) $$\frac{\partial \mathrm{L}}{\partial \lambda} = m\pi - D - A = 0$$

(43) $$\frac{\mathrm{U'_D}}{\mathrm{U'_A}} = \frac{-\lambda}{-\lambda} \Rightarrow$$

(44) $$U'_D = U'_A = \lambda \quad \text{و} \quad 1 = \frac{U'_D}{\lambda} \quad \text{و} \quad 1 = \frac{U'_A}{\lambda}$$

Based on this, the first (necessary) condition for the producer's equilibrium is: the equality of the marginal satisfaction of the remainder of profit to spend in this life (the satisfaction that is obtained from each unit of personal spending for this life from the remainder of profit) with the satisfaction the ultimate goal of life after death, which he expects from every unit of cost in the way of God (from profit or lost opportunity). The coefficient can be considered as the ultimate satisfaction of each unit of money to spend on the way to achieve satisfaction. Because in equilibrium, a person should equate the mathematical expectation of ultimate satisfaction of one unit of cost for life in this world with the mathematical expectation of ultimate satisfaction of one unit of cost for life after death.

The second condition of maximization is that the bounded Hessian determinant of its partial second derivatives is positive. These determinants are given below:

$$\Delta = \begin{vmatrix} U''_{DD} & U''_{D,A} & -1 \\ U''_{A,D} & U''_{AA} & -1 \\ -1 & -1 & 0 \end{vmatrix} > 0 \tag{45}$$

By analyzing these determinants, we will have:

$$2U''_{D,A}1 * 1 - U''_{DD}(1^2) - U''_{AA}(-1^2) > 0 \tag{46}$$

By placing relationship 43 in this relationship, we will have

$$2U''_{D,A}U'_A\,U'_D - U''_{DD}U'^2_a - U''_{AA}U'^2_d > 0 \tag{47}$$

Assuming that the marginal satisfaction (utility) of two types of costs is decreasing* (an assumption that is always accepted in these analyses), this relationship is valid. With this assumption, all the components of the first part of the relationship from (left side) are positive, so this part is positive. Because U'^2_a is positive and U''_{DD} is negative and their coefficient is negative, the second part is also positive and because U'^2_d is positive and U''_{AA} is negative and their coefficient is also is negative, the third part is also positive. Based on this, all parts of the relationship are positive. Thus, this relationship fulfills the assumption of pseudo-concaveness of the satisfaction function (in two-dimensional space), on which basis, maximization can be established.

Figure 1 shows this position for the producer, where the horizontal axis shows the cost in the way of God and the vertical axis shows the remainder of profit. The opportunity asset line to allocate in God's way and the Remainder of profit is also drawn with the Mπ line and the indifference curve between the remainder of profit and the cost in God's way (u). The producer is in optimal position at the point e, which

is the point where the opportunity asset line and the indifference curve are tangent, and has two allocations A_e and D_e for the cost in God's way and the residual profit.

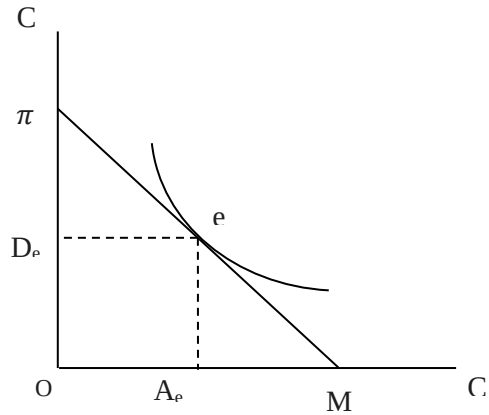

*Figure 1***:** The optimal position of allocation of production opportunity profit to cost in the way of God and profit

It is reminded that in the given point of view, the producer can cost in the way of God in the production process, or he can maximize his profit and spend a part of it in the way of God. In the second option, our analysis for the producer's behavior is the same as traditional economic analysis, and it is explained in assumption one and figure 5. Most of our analysis is on the cost option in the way of God in the production process, which changes the behavior of the producer in production.

Optimal production size

At the same time as the producer makes a decision about the possible profit allocation of his production firm to achieve satisfaction for the sake of life in this world and life after his death, he also clarifies the size of his production, according to the option of the decision. The various conditions of the society are an important factor determining the actions that include the reward of life after death. It may be that a activity does not have the reward of life after death under normal conditions and it has the reward of life after death under special conditions, and the opposite is also true for another activity.

What is important in the producer's decision is the production costs and all that he gets from the production. The producer has two costs in the production process: one is the cost of production and the other is the cost in the way of God, which is spent in the production process. Against these expenses, the producer gets two things: one is the revenue from the sale of manufactured goods and the other is the satisfaction he gets from cost in the way of God. In order to realize the satisfaction of the cost in the

way of God, the producer can measure it in his mind and add it to the revenue from the sale of the manufactured goods and make it equal to the expenses. To make it clearer, we will explain more.

It is reminded for the sake of simplicity here, it is assumed that the producer is facing a market like perfect competition for his product, where the price of the product is fixed. If we change the assumption of the market, the analysis will change a little, but in general it will have the same framework.

The effect of satisfaction resulting from cost in the way of God on the size of production

It can be said that the satisfaction that the producer gets from cost in the way of God in the production process is a kind of gain (revenue) and the producer will include it in his decision-making and based on that, the revenue (gain) will be added to the revenue. Sales and remainder of profit optimizes production size. To show this effect, we assume that figure 2 shows the situation of a producer, for this producer, the curves of marginal cost and total average cost are like MC and AVC, without any cost in the way of God.

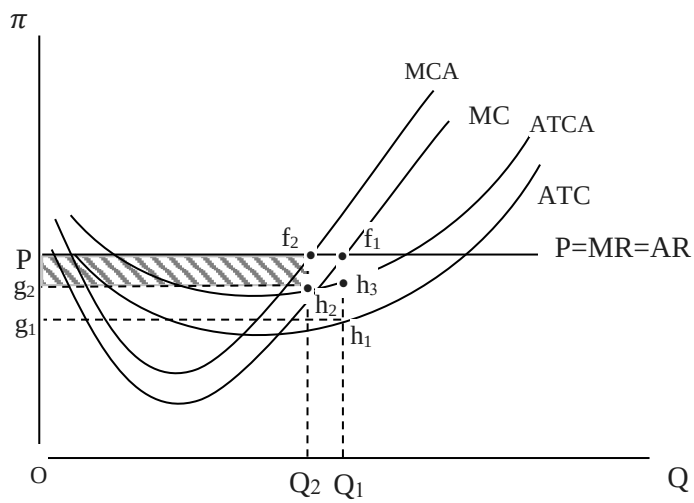

Figure 2: The effect of cost in God's way on the firm's monetary remainder of profit

Assuming that the price in the market is represented by the line P, if this producer wants to maximize his profit, he chooses the point f_1 where the marginal cost of production is equal to the price (marginal revenue). The amount of production is Q_1 and the profit of the firm is equal to $(p-g_{1)}\times Q_1$ (or the area of the rectangle $g_1pf_1h_1$). If this firm has an average cost of h_1h_3 for each production unit, then the average and marginal cost of the firm will be shifted to the MCA and AVCA curves. In this

assumption, if the cost in God's way is not satisfactory for the producer, with the same goal of profit maximization, if the price in the market is the same line as P, producer choose point f_2 where the marginal cost of production is equal to the price (marginal revenue). The amount of production is Q2, and the firm's profit is equal to $(p-g_2)\times Q_2$ (or the area of the rectangle $g_2pf_2h_2$). This monetary profit is much less than the previous profit. So why does the producer do this?

As we said, the producer seeks to maximize his satisfaction. It spends the maximum possible profit to obtain satisfaction. He loses part of the profit by adding cost in the way of God in the production process to gain satisfaction for life after death. The producer also keeps a part of the profit in order to spend it for the life of this world and to gain satisfaction. We assume that the maximum profit shown in point f_1 in the figure 2 is equal to the assets that can be allocated to the balance of profit and cost in the way of God, which is shown by the line $M\pi$ in figure 3. If the producer's indifference curve is like u_1, his optimum will be at point E, where A_e spends from profit in the way of God, and D_e takes as the remainder of profit for the life of this world. Here, the satisfaction he gets is equal to u_1. But if this producer wants to maximize his profit with the same curves in figure 3 without cost in the production process in God's way, he takes place at point f_1 and takes all his profit to spend in the life of this world. If he spends this profit for the life of this world, he will be placed at point π in figure 3. This producer is located on the u_2 indifference curve and the amount of satisfaction he gets at this point is equal to u_2. The size of u_2 is less than u_1, which he earns by spending a part of the profit in the way of God. If this producer wants to increase the sum of his satisfaction by cost in the way of God and spending for the life of this world to u_2, he can be placed at point f with the budget line $M_1\pi_1$. The leading producer has achieved this satisfaction at this point only with a profit equal to π_1. Based on this, it can be said that the opportunity cost of point f compared to point E is higher by $\pi - \pi_1$. This lost opportunity reduces the producer's satisfaction to the size of the area of the hexagon $D_2D_eEA_eA_1f$ and increases it from the area of the square OD_eEA_e to the area of the square OD_1fA_1. It can be said that the monetary value is equal to the difference between these two levels of satisfaction for the same type of producer's revenue from production, which is added to the profit. This higher revenue can be considered equal to $\pi - \pi_1$ or the sum of $(D_e\text{-}D_1) + (A_e\text{-}A_1)$.

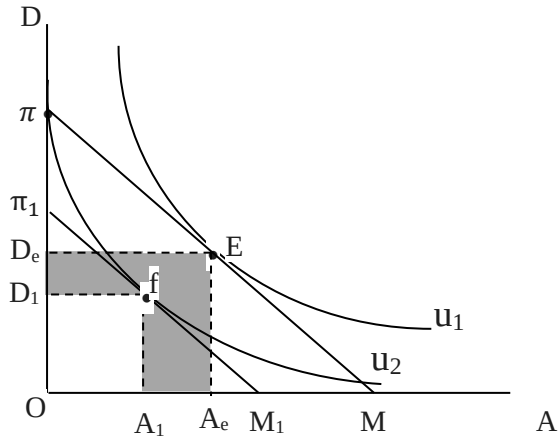

Figure 3: The effect of cost in God's way on the producer's satisfaction and monetary revenue

Based on this, it can be said that the producer gets something more than the mentioned profit by cost in the way of God in the production process. In other words, his revenue is not the only revenue from selling goods. Sales revenue is in addition to this opportunity revenue. If we divide $\pi - \pi_1$ by the amount of production, the average of this revenue is obtained. We denote it by FA. If we want to obtain the real average and marginal revenue of this producer, we must add the price (P) to this revenue (FA). In this case, the marginal revenue line shifts upwards.

In order to better show the effect of this real revenue, we put figure 4 instead of figure 3. We said that this producer, without having any cost in the way of God, assuming that the price in the market is represented by the line P, if he wants to maximize his profit, point f_1 where the marginal cost of production is equal to the price (marginal revenue) is chosen. The amount of production is equal to Q_1 and the profit of the firm is equal to $(p\text{-}g_1) \times Q_1$ (or the area of the rectangle $g_1pf_1h_1$). If this firm has an average cost $h_4\text{-}h_1$ for each production unit, then the average and marginal cost of the firm will be shifted to the MCA and ATCA curves. In this assumption, if the cost in God's way for the producer is equal to what was said in the explanation of figure 3, the producer will get a revenue equal to $\pi - \pi_1$ (in figure 3) or average FA. This average can be added to his revenue and the marginal and average real revenue line of the producer can be considered equal to $P+FA_1$ line. We have shown this line in figure 4. We have shown this line with MRA_1. With this line, the marginal real revenue of the producer will produce by assuming the maximization of his satisfaction at the point where this marginal real revenue is equal to his marginal cost. The producer chooses point f_3, which is the optimal production size equal to Q_3. In this

assumption, the producer's real profit is equal to $(P_F\text{-}g_3) \times Q_3$ or the area of the rectangle $P_Fg_3f_3h_3$

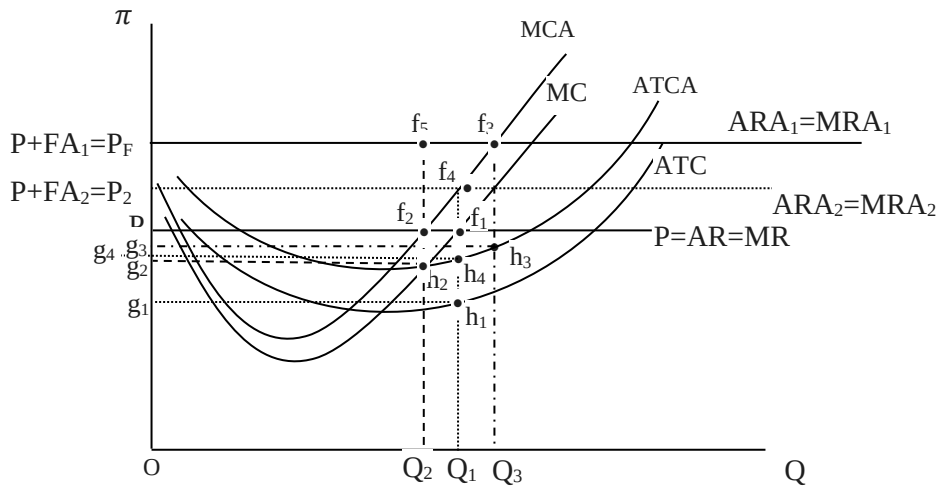

Figure 4: The effect of value (revenue) equivalent to the satisfaction of the cost in the way of God on the size of production

If the producer stays at point f_2 while he could produce more, he did not have an optimal decision. So, to optimize the decision, it should go to the point where the marginal real revenue equals the marginal cost, which is a point like f_3. Point f_3 is a point assuming an increase in real revenue equal to FA_1. If the increase in real revenue mentioned in Figure 4 is greater than FA_1, the marginal revenue line will rise more, and as a result, the optimal production will be larger, and if the increase in real revenue is less than FA_1, the marginal revenue line will rise less. river and as a result, the optimal production will be in a smaller size. At a glance, it can be said that FA is positive and thus, the marginal real revenue line will be higher than P and based on that, production will be higher than Q_2. If FA increases to the extent that it is only equal to the cost incurred by the producer in the production process, which is shown in the figure by the line $P+FA_2$, production will remain at the same maximum point of basic profit, i.e. Q_1. In this assumption, the optimal production point is at point f_4. Based on what was said in the assumption of rationality, it is not rational for the real revenue of this world and the world after death to be less than the cost incurred by the producer.

To show the inconsistencies of these assumptions and its effect on profit and production, we show the real profit of the producer in the 4 mentioned situations (in 3 production sizes Q_1, Q_2 and Q_3) in the following figure s.

I. We assume that the goal of a producer is to maximize free cost in the way of God in the production process, and he is faced with a fixed price P for his product according to figure 5. Here it can be assumed that the producer does the production to earn profit and after earning profit, he spends a part of his profit in the way of God. Such an analysis of producer behavior would be similar to the analysis of profit maximizing behavior in traditional economics. In this condition, his optimal production size will be at point f_1 (equality of the marginal monetary cost of with the marginal monetary revenue) with the production size of Q_1. In this position:

The revenue of the firm is PQ_1 or the area inside the rectangle OPf_1Q_1.

The firm's cost is g_1Q_1 or the area inside the rectangle $Og_1h_1Q_1$.

The profit of the producer is equal to $(P\text{-}g_1) \times Q_1$ or the area inside the square $g_1Pf_1h_1$.

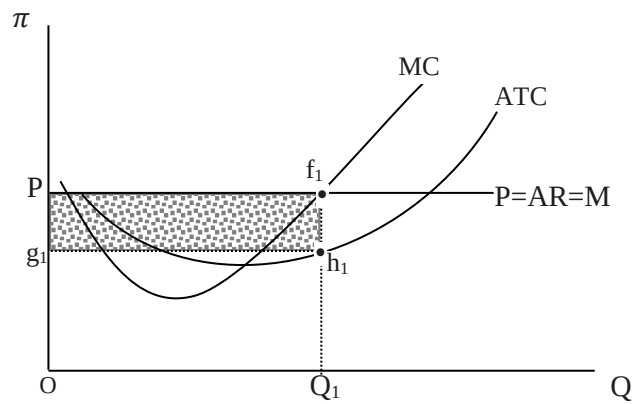

Figure 5: They generate maximum profit without cost in the way of God

II. We assume that we have a producer who, having a cost in the way of God in the production process, his goal is to maximize the real profit (monetary value equivalent to the satisfaction of the cost in the way of God + monetary profit) and is equal to figure 6 with a fixed marginal real revenue. P_F is facing. Then, the optimal size of his production will be at point f_3 (equality of the marginal monetary cost to the marginal value equivalent to the satisfaction of cost in God's way + the marginal monetary revenue) with the production of Q_3. In this position:

The real revenue of the firm is P_FQ_3 or the area inside the rectangle $OP_Ff_3Q_3$.

The firm's cost is g_3Q_3 or the area inside the rectangle $Og_3h_3Q_3$.

The producer's real profit is equal to $(P_F\text{-}g_3) \times Q_3$, or the area inside the rectangle $g_3P_Ff_3h_3$.

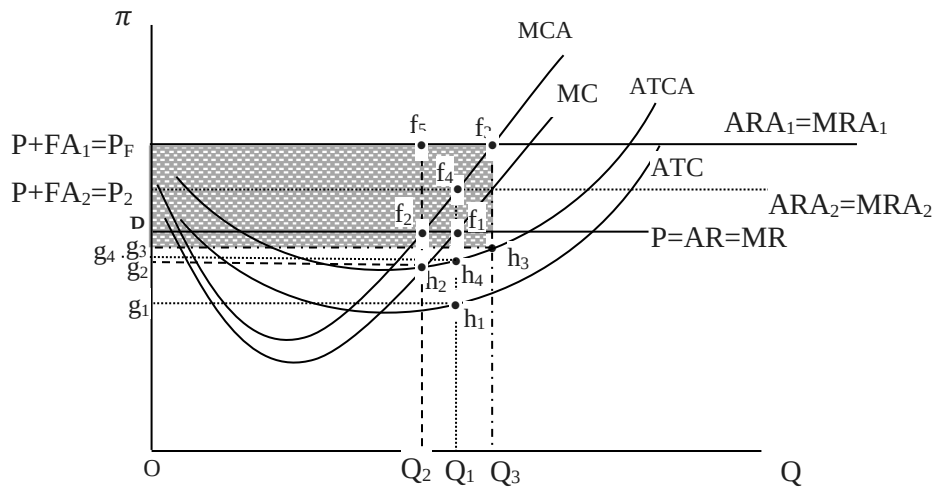

Figure 6: The real profit of the producer with production at the point of equality of the marginal cost (include the cost in the way of God) with the marginal monetary value equivalent to the satisfaction of the cost in the way of God + the marginal monetary revenue

III. We assume that we have a producer who, having a cost in the way of God in the production process, his goal is to maximize the real profit (monetary value equivalent to the satisfaction of the cost in the way of God + monetary profit). According to Figure 7, he faces constant marginal real revenue P_F. Then if his output is set at point f_2 (which is not optimal), output is Q_2.

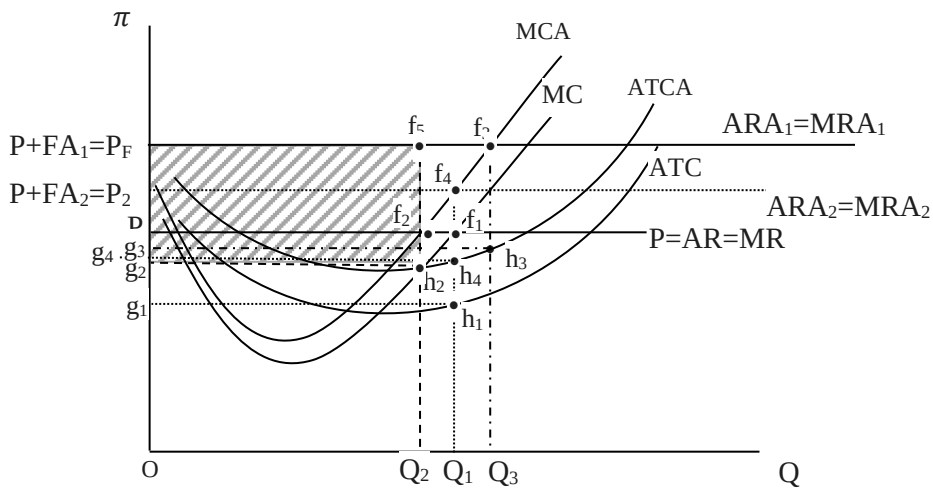

*Figure 7***:** Real profit and revenue equal to the satisfaction of the cost in the way of God the producer with production at the point of equality of the marginal cost of Rials and the marginal revenue of Rials

Here, the marginal cost is equal to the real revenue (monetary value equivalent to the satisfaction of cost in God's way + monetary profit). In this position:

The real revenue of the firm is P_FQ_2 or the area inside the rectangle $OP_Ff_5Q_2$.

The firm's cost is g_2Q_2 or the area inside the rectangle $Og_2h_2Q_2$.

The producer's real profit is equal to $(P_F\text{-}g_2) \times Q_2$ or the area inside the rectangle $g_2P_Ff_2h_2$.

IV. Let's assume that we have a producer according to figure 8 who, having cost in the way of God (CA) in the production process, his goal is to maximize the real profit (Monetary value equivalent to the satisfaction of the cost in the way of God + Monetary profit). If he has no cost in God's way, the firm's marginal and average cost curves are equal to MC and ATC, which he will produce without cost in God's way by maximizing profit at the optimal point f_1 as much as Q_1. If the cost in the way of God in the production process is equal to CA, then this cost will move the firm's marginal and average cost curves from MC and ATC to MCA and ATCA curves. We ask this question that with this cost in the way of God that he has, how much revenue should he have in the amount of money for the satisfaction obtained from this cost so that he still has the amount of Q_1 production?

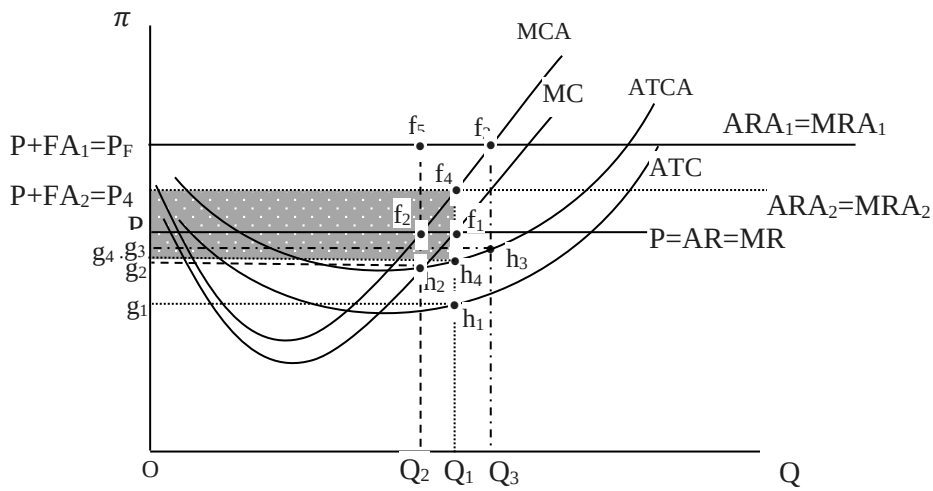

Figure 8: Monetary value of equivalent to the satisfaction obtained from cost in the way of God with production at the point where the marginal monetary cost is equal to the marginal monetary revenue

For the answer, we can say that the marginal monetary value of equivalent to the satisfaction obtained from cost in the way of God, must be enough to cover his marginal cost at this point of production. In other words, the Monetary value of equivalent to the satisfaction of cost in the way of God should be equal to $(P_4\text{-}P)\ Q_1$ or the area inside the square $PP_4f_1f_4$. In other words, if he pays the said cost in the way of God, the average value equivalent to the satisfaction he gets from this cost in the way of God (FA/Q_1) plus his average sales revenue (P) should be equal to P_4. In this position: The real revenue of the firm is P_2Q_1 or the area inside the rectangle $OP_2f_4Q_1$.

The firm's cost is g_4Q_1 or the area inside the rectangle $Og_4h_4Q_1$.

The producer's real profit is equal to $(P_2\text{-}g_4)\ Q_1$ or the area inside the rectangle $g_4P_4f_4h_4$.

Several special modes

As we said, there are many possible ways to achieve the satisfaction of life after death, and whatever activity in the way of God, has a clear satisfaction for life after death. The producer, in his decision-making process, picks them from the most to the least and compares them with the satisfaction of life in this world, which is obtained from the remainder of profit. He starts his choice from the greatest satisfaction of life in this world and life after death to reach the balance point and his decision cannot be limited simply by one variable. Despite this, it is possible to

consider special cases where the producer's decision variable in special conditions is limited to one variable. Among the various states, we assume some special states where there is only one decision for the producer, in which every unit of cost in the way of God, is satisfied (for life after death). It can be equal to the satisfaction he gets from spending the remainder of profit for the life of this world. We explain an example of these situations.

Profit maximization

We assume that the conditions of the society are such that spending the profit after production provides more satisfaction to the producer for life after death. In this assumption, the producer will not cost in the way of God in the process of production, and he adjusts his production according to the conditions of maximum profit, as in the traditional economic theory. After achieving the maximum profit, he spends part or all of the profit in the way of God. His decision in allocating profits to achieve satisfaction for the sake of life in this world and life after death will be like the traditional theory of consumer behavior.

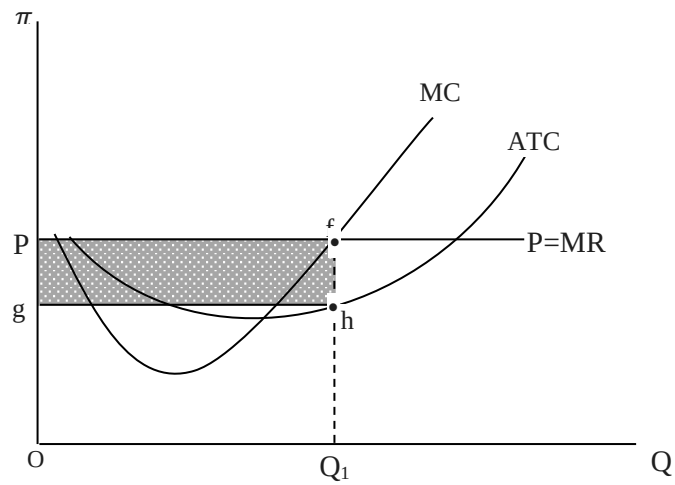

Figure 9: Optimum production and profit of the profit maximizing firm

In order to show the production size of a producer who seeks to maximize profit, we assume that this producer is in a competitive market. Based on what we know, in order to maximize his profit, he should produce where the firm's marginal cost of production is equal to its marginal revenue. In a competitive market, the marginal revenue is the same as the price. If the firm's marginal and average cost curves are like MC and ATC in figure 9, the firm chooses point f and this basis

produces Q_1 which it sells at price P. The profit of this firm in this production will be equal to the area of the quadrangle gpfh, which is the maximum profit of this firm.

Increasing some costs in the production process to achieve the satisfaction of life after death

We assume that there is a predetermined task for the producer that requires an increase in the cost of production (such as Zakat or paying more wages to employees to gain God's pleasure) to a certain amount that the satisfaction of life after death is greater than the opportunity cost of the satisfaction of life in this world of that cost. In this case, the producer can maximize his real profit by calculating these costs in the cost of production and bringing the monetary value equivalent to the satisfaction he gets from spending in the way of God from his monetary revenue. Here, the production cost function (fixed cost or variable cost) and also the real revenue function that he enters in his decision changes. Based on this, here we have a model for maximizing satisfaction, in which the satisfaction of the producer is a function of the size of the remainder of profit (π) and the satisfaction obtained from the expenses in the way of God (CA), that is:

$$U = u(\pi, CA) \tag{48}$$

π is the remainder of profit variable for personal cost, which is obtained by subtracting the total cost (TC) and costs in the way of God (CA) from the total monetary revenue of production (TR), that is:

$$\pi = TR - TC - CA \tag{49}$$

where the total monetary revenue and the total cost of production are functions of the size of production (q) and are as follows:

$$TR=pq \tag{50}$$

$$C=C(q) \tag{15}$$

The relationship between the level of remainder of profit and the maximum possible profit ($m\pi$) is as follows:

$$\pi = m\pi - CA \tag{52}$$

But on the revenue side, as it was said, the producer does not consider only the monetary revenue from the sale of his manufactured goods, in addition, he adds revenue (value) equivalent to the satisfaction of obtained by cost in the way of God to it and includes it in his analysis. On this basis, the sum of the producer's real revenue from this production activity (enterprise) is equal to the monetary revenue from the sale of manufactured goods, plus the monetary value equivalent to the satisfaction he

gets by cost in the way of God. On this basis, we have the real revenue of the total producer.

(35) $$TRA = TR + FA$$

On this basis, the real profit function of the firm is:

(54) $$F\pi = (TR + FA) - (TC + CA)$$

In this situation, it is possible to see various modes for the cost in the way of God the producer. We assume and analyze some examples of these situations.

a. The behavior of a producer whose cost is constant in the way of God

We assume that the producer has a fixed cost in the way of God. Such as create a factory in a city where unemployment is high and making work for them is rewarded by God (compared to create a factory in a city that does not have this feature) or employing a few disabled workers whose efficiency is healthy. or that the producer has several options (which are separated based on the type of production, such as the production of essential or non-essential goods for the society) for investment, and the production of essential goods that people have a special need for is God's reward. It can be said that this producer maximizes his remainder of profit function. His optimum can be obtained by a simple maximization. This behavior is explained. The objective function of the producer can be written as:

(55) $$Max: F\pi = TR(q) + FA - TC(q) - CA$$

or:

(56) $$Max: F\pi = TR(q) - TC(q) + (FA - CA)$$

Because FA-CA is constant, by deriving the profit function to generate and equalize it to zero, we have:

(57) $$\frac{\delta\pi}{\delta q} = TR'(q) - TC'(q) = 0$$

By solving it based on the production size, the optimal production size for this producer is obtained.

(58) $$\frac{\delta\pi}{\delta q} = TR'(q) - TC'(q) = MR - MC = 0 \quad \Rightarrow \quad MR = MC$$

Here, the producer's production will be optimal at a point where the marginal cost of his production is equal to the marginal revenue of his production. The condition of this optimum is like the condition that the producer does not have to spend in the way of God in the production process and after obtaining a profit, spends

part or all of it in the way of God. If the producer's profit maximization is consistent with his other goals, he tries to maximize his profit so that he has more money to enjoy its satisfaction (spending).

The important point here is that although the producer's marginal cost and real revenue and the marginal income are the same with the conditions in which there is no cost in the way of God, but the average cost and the average real revenue of this producer in the condition is not the same as condition that has no cost in the way of God. Here, the average producer cost is equal to:

(59) $$ATCA = \frac{TC(q)+CA}{q}$$

This average cost is higher than the average cost of the costless producer in God's way. This average cost is greater than a constant (AC) divided by the amount of production (q). This average decreases with the increase in production. In other words, the average cost curve with cost in God's way at the beginning is much higher (higher) than the average cost curve without cost in God's way, and with the increase in production, the distance decreases and approaches it. As shown in figure 10 with ATC curves (average cost without cost in God's way) and ATCA (average cost curve with cost in God's way).

Assuming that the price is constant, the average revenue without cost in the way of God and its satisfaction is equal to the price, which is shown by line P in Figure 10. But if the producer spends money in the way of God and gets satisfaction from this cost, it will not be like this. With the assumption that the producer has a cost in the way of God and the cost in the way of God of this producer is constant, the satisfaction that the producer gets from it will also be constant and on this basis, the monetary value equivalent to this satisfaction will be fixed. If we want to add this monetary value equivalent to the satisfaction of cost in God's way to the revenue from the sale of manufactured goods, the real revenue is obtained, and by dividing it by the production size, the average real revenue is obtained, as in the following relationship:

(60) $$ATRA = \frac{TR(q)+FA}{q} = \frac{qp}{q} + \frac{FA}{q} = P + \frac{FA}{q}$$

This relationship shows that the sum of the real average revenue of this producer (by obtaining the satisfaction of cost in God's way) is more than the price. However, his marginal real revenue as well as his marginal monetary revenue after the start of production is the same price (line P). This average real revenue is very high in small production (beginning of the curve) and decreases with the increase of production. It can be seen as the ATRA curve in figure 10.

To show these conditions, we assume that this producer has the marginal and average cost curves of MC and ATC and the fixed price P in figure 10 without

incurring any costs in God's way. Based on that, the producer equates the marginal cost (MC) with the marginal revenue (P price) to find out the optimal production size, and the point f_1 is obtained. At this point, the optimal production size is equal to q_1. Here the producer's total revenue is pq_1, his total cost is g_1q_1 and his profit is equal to $(p-g_1)\ q_1$. This profit is the area inside the rectangle $g_1ph_1q_1$ (hatched).

As it was said, if the producer has a fixed amount of CA (cost in the way of God) in the production process, with the mentioned assumptions, the average cost of the producer will increase by the amount of CA divided by q and it will be like the ATCA curve. With this assumption, the creation and operation of this firm brings God's reward for the producer. If we consider FA as the monetary value of this reward or satisfaction, then the average of this monetary value will be equal to FA/q and it will increase the average real revenue of the producer at each point of production by this amount, and the producer average real revenue curve becomes like the ATRA curve, which is very high at the beginning and decreases along with the increase in production (q) and its slope also decreases. For this producer in production q_1 we have:

The marginal monetary cost and the marginal actual cost of production are equal to P and are shown on the MCA curve by point f_1.

The total cost of production is equal to q_1g_2 and is represented by the area of the square $og_2g_2q_1$.

The average total cost of production is equal to g_2 and is represented by point h_2 on the ATCA curve.

The marginal monetary revenue and the marginal real revenue of the producer are equal to P and are shown on the MR line by point f_1.

The average sales revenue (average monetary revenue) of the producer is equal to P and is shown on the MR line with point f_1.

The real revenue of the producer is equal to q_1g_3 and is represented by the area inside the square $og_3f_2q_1$.

The average real revenue of the producer is equal to g_3 and is shown on the ATRA curve by point f_2.

The monetary profit of the producer's sale is equal to $(p-g_2) \times q_1$ and is shown by the area inside the square $g_2pf_1h_2$ (gray with a border). The average monetary profit is equal to $p-g_2$.

The producer's real profit is equal to $(g_3-g_2) \times q_1$ and is represented by the area inside the square $g_2g_3f_3h_2$ (grey). Average real profit is equal to g_3-g_2.

But in the assumption that this producer does not have any cost in the way of God in the production process, it will be as shown in figure 10. The producer's marginal and average revenue is equal to p. The producer's total revenue is pq_1. His average cost is equal to g_1 and his total cost is equal to g_1q_1, and the profit of the producer, which is the only monetary profit, is equal to $(p-g_1)q_1$.

The point that we should pay special attention to here is that in this example, the producer's production is equal to the production with the maximum monetary profit. The output of this producer is equal to q_1. But when the producer believes in God's reward and he brings the resulting satisfaction into decision making, assuming this example that the marginal cost is the same as MC and the marginal satisfaction of the cost in the way of God for the producer is also zero, production remains the same as before. Here, the producer's total monetary profit is not the maximum, but the satisfaction he gets from the production (for the life of this world and the life after death) is the maximum, and it is more than the other assumptions of God's displeasure. That is, the producer's real profit is the maximum.

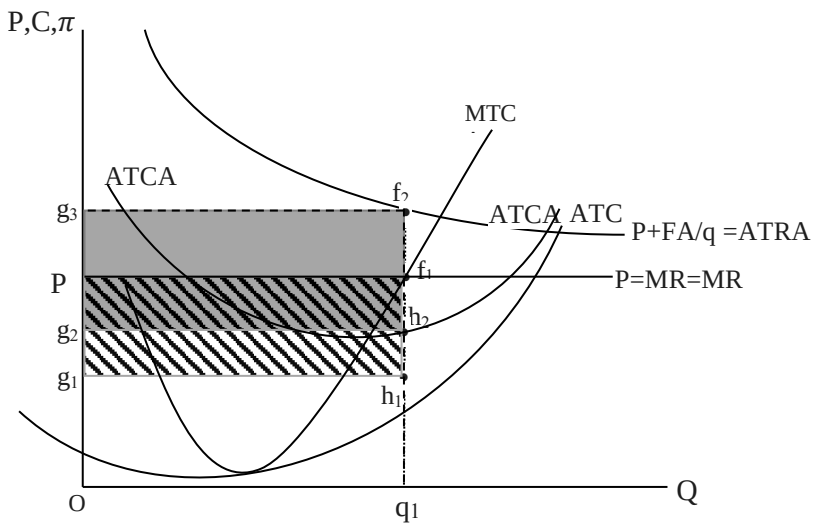

Figure 10: Optimum for producer whose has fixed cost in the way of God

A general principle is that if the sum of the satisfaction monetary value of cost in the way of God plus profit is more than the maximum profit in a situation where the producer has no cost in the way of God, that means the real profit of the producer is greater than the maximum profit (without cost in the way of God), then it will choose this point. If the value of the maximum profit is more than the value of the satisfaction obtained from working for God (satisfaction obtained for life after death)

plus the remainder of profit, may be the producer will not have to spend in the way of God, and his option be the point of maximum profit.

b. The behavior of a producer whose cost in the way of God depends on the production

Another hypothetical example is that the cost in the way of God that the producer pays in the production process depends from production size. Such as paying the workers who work in the firm a higher wage or allowance than the legal payment that with the increase in production, more workers must be employed, and the payment to the workers increases with the increase in the number of workers, or that a part (percentage of predetermined) to give the production to the needy in the way of God or to help the needy for each unit of production. In this example, both the cost in the way of God that the producer pays depends to the size of the firm's production, and the value equivalent to the satisfaction of the cost in the way of God of the producer is a function of the size of production. In this assumption, the producer's objective function is the real profit function and it becomes like the following relation:

(61) $$Max: F\pi = TR(q) + FA(q) - TC(q) - CA(q)$$

To find the optimal point of production, by deriving from the objective function (the real profit function) with respect to production and equalizing it to zero, we have:

(62) $$\frac{\delta F\pi}{\delta q} = TR'(q) + FA'(q) - TC'(q) - CA'(q) = 0$$

By solving it based on the production size, the optimal production size for this producer is obtained.

(63) $$\frac{\delta \pi}{\delta q} = MR + MFA - MC - MCA = 0$$
$$\Rightarrow \quad MR + MFA = MC + MCA$$

(64) $$\Rightarrow \frac{\delta F\pi}{\delta q} = MTRA(q) - MTCA(q) = 0$$

In better words, here the producer's optimal production is at the point where the sum of the marginal real revenue of production (MTRA) is equal to the sum of the marginal total cost of his production (MTCA).

Figure 11 shows the position of this producer. We assume that the marginal total cost and the average total cost of the producer without having any cost in God's way are shown by MC and ATC curves and the price line is shown by PF. In this situation, if he wants to have a cost in God's way in the production process that is a function of production, this cost will move the curves of the marginal cost and the average cost of his total production upwards. This cost can be enough to bring these curves to MCA and ATCA. Also, if this producer obtains from the cost of each unit

of production in the way of God as much as AFA, value equivalent to the satisfaction of the cost in the way of God, and this satisfaction is constant, then his marginal real revenue line will rise. The line of real revenue makes him like the PF line (AFA+P). Because the price (P) and the average monetary value equivalent to the satisfaction of the cost in God's way (AFA) are constant, the marginal real revenue line and the average real revenue will become one and parallel to the horizon (ATRA = MTRA). In this case, the producer's optimal point will be where the marginal total cost of production is equal to the real marginal revenue, in other words:

(65) $MR + MFA = MC + MCA$

(Or) $MTRA = MTCA$

This position is shown in the above figure at point f_e, where output is q_e, average real revenue (P+AFA), marginal real revenue (MR+MFA), as well as marginal total cost PF and average total cost g. Based on this:

The producer's average total cost is equal to q_eh_e or the area inside the rectangle ogh_eq_e (white area).

The producer's real revenue is equal to $P_F \times q_e$ or the area inside the rectangle $gP_Ff_eh_e$ (white + dotted gray area).

The producer's real profit is equal to $q_e \times (P_F\text{-}g)$ or the area inside the rectangle $gp_Ff_eh_e$ (dotted gray area).

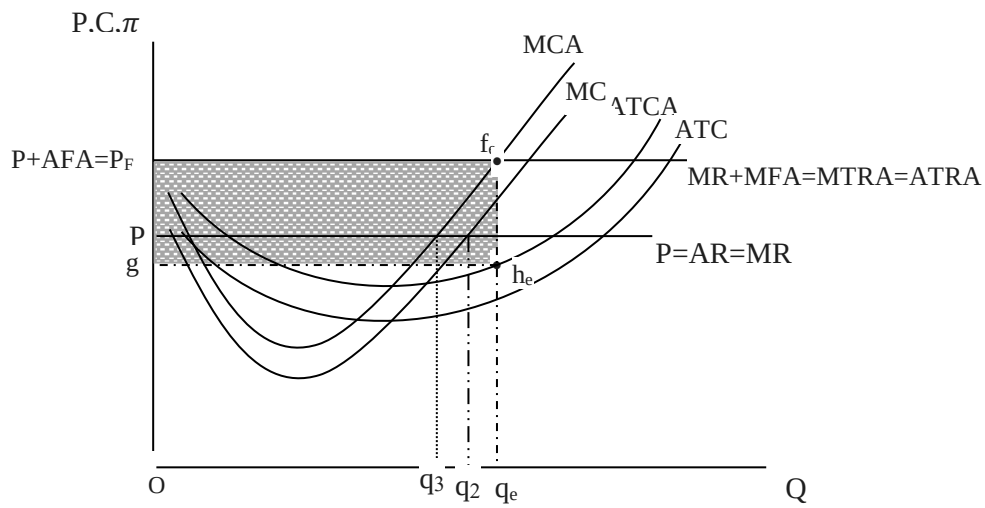

Figure 11: Optimal for the producer whose cost in the way of God depends on the amount of production

In this assumption, the producer's production is more than the production size with the maximum monetary profit. The output of this producer is equal to q_e. But if this producer only equals the marginal monetary cost before the cost in God's way with the marginal monetary revenue of production, the optimal size of his production would be q_2, which is less than q_e. Also, if the producer equals the marginal total cost (by adding the cost in God's way, ie MTCA) to the marginal monetary revenue, his optimal production size would be q_3, which is still less. q_e production is more than the optimal production based on the equality of the marginal monetary cost and the marginal monetary revenue, as well as the marginal cost (without adding costs in God's way) with the real marginal revenue. In other words, the production is not optimal with those bases. But when the producer believes in God's reward and brings the satisfaction, he gets from it into decision-making, assuming this example, he increases the production and his optimal production is like q_1. Here, the producer's total monetary profit is not the maximum, but the satisfaction he gets from the production (for the life of this world and the life after death) is the maximum, and it is more than the other assumptions of God's displeasure.

c. The behavior of a producer whose satisfaction and cost in the way of God are dependence to production

Another hypothetical example is that both the cost in the way of God that the producer pays in the firm's production process is a function of the firm's production and the satisfaction that is obtained from each unit of this cost is reduced. The costs in the way of God in this hypothesis are the same as hypothesis B, but the satisfaction of the mind is reduced. This reduction is more natural and more compatible with the assumptions of rationality and the subject of preference as well as human motives. Here too, both the cost in the way of God that the producer pays and the monetary value equivalent to the producer's satisfaction of the cost in the way of the God of are functions of the firm's production. In this assumption, the objective function of the producer is the real profit function and it becomes like the following relation:

(66) $$Max: F\pi = TR(q) + FA(q) - TC(q) - CA(q)$$

To find the optimal production point, by deriving the objective function or the real profit function for production and equalizing it to zero, we have:

(67) $$\frac{\delta F\pi}{\delta q} = TR'(q) + FA'(q) - TC'(q) - CA'(q) = 0$$

By solving it based on the production size, the optimal production size for this producer is obtained.

(68) $$\frac{\delta F\pi}{\delta q} = MTRA(q) - MTCA(q) = 0$$

The producer will produce at an optimal point when the marginal real revenue of production (MTRA) is equal to the marginal total cost of production (MTCA).

Figure 12 shows the position of this producer. We assume that the marginal cost and the average cost of the total producer without having any cost in the way of God are shown by the MC and ATC curves and the price line is shown by the P line. In this situation, if he wants to have a cost in the way of God in the production process, which is a function of production, this cost will move the curves of the marginal cost and the average cost of his firm upwards. This cost can be enough to bring these curves to MTCA and ATCA. Also, if this producer obtains a value equal to AFA(q) from the cost he has for each unit of production in the way of God (monetary value equivalent to satisfaction due to the cost in the way of God) and this satisfaction is a function of production, then the line of marginal real revenue of production (marginal value equivalent to the satisfaction of the cost in God's way + the marginal monetary revenue of the sale) rises, but its slope is negative (like the MTRA line (MFA+MR). Because the price (P=MR) is constant and marginal value equivalent to the cost in God's way (MFA) is decreasing and the marginal real revenue (ATRA) is decreasing, where the slope of the average real revenue is lower than marginal cost (the marginal cost of production + the cost in God's way) of the producer is equal to the real marginal revenue (the value equal to the satisfaction of the cost in God's way + the marginal revenue of the producer), in other words, we will have:

(69) $$MR + MFA = MC + MCA$$

(Or) $$MTRA = MTCA$$

This position is shown in the mentioned figure at point f_e, where production q_e, the average real revenue on the curve (line) ATRA(q) (equal to P+AFA), and the marginal real revenue is on the curve (line) MTRA(q) (equal to MR+MFA). Also, the marginal total cost is P_F and the average total cost is g. Based on this, in q_e production:

The producer's average total cost is equal to q_e.g or the area inside the ogh_eq_e rectangle (white area).

The producer's real revenue is equal to P_F,q_e or the area inside the rectangle $oP_Fr_eq_e$ (white + hatched area).

The producer's real profit is equal to $q_e(P_F-g)$ or the area inside the rectangle $gP_Fr_eh_e$ (shaded area).

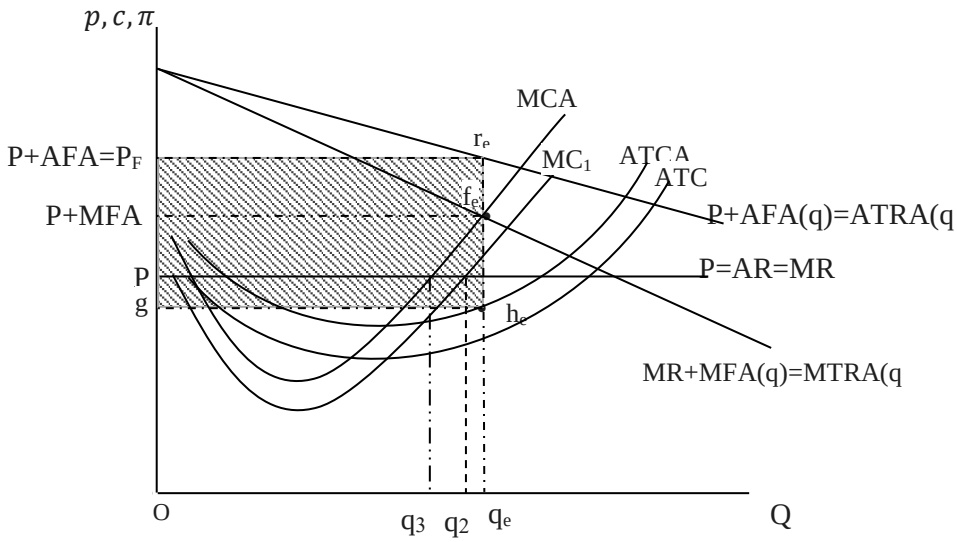

Figure 12: Optimum for producer whose satisfaction and cost in the way of God are functions of the production

In this assumption, the producer's production is more than the production size with the maximum monetary profit. The output of this producer is equal to q_e. But if this producer only equals the marginal monetary cost before the cost in the way of God with the marginal monetary revenue of production, his production size would be equal to q_2, which is less than q_e. Also, if the producer equals the marginal monetary cost by adding the cost in the way of God to the marginal monetary revenue, his production size would be q_3, which is still less. Optimal production q_e is more than production based on the equality of marginal monetary cost and marginal monetary revenue, as well as marginal cost and real marginal revenue. In other words, production with those foundations is not optimal. But when the producer believes in God's reward and brings the satisfaction, he gets from it into decision-making, assuming this example, he increases the production and his optimum in producing more is like q_e. Here, the producer's total monetary profit is not the maximum, but the satisfaction he gets from the production (for the life of this world and the life after death) is the maximum, and it is more than the other assumptions of God's displeasure.

The producer behavior that involves producing God's pleasure

We assume that the producer and his society are in a situation where two factors can satisfy the producer: one is the profit to spend in this world and achieve the satisfaction of this life and the other is to increase the welfare of the society which

is obtained by increasing the production. It comes and brings the satisfaction of God and as a result the improvement of life in the world after death and the satisfaction of the mind. Based on this, one part of the producer's goal is achieved with profit, and the other part of his goal is achieved with increasing production. He will try to increase these two, because his satisfaction is subordinate to these two goals. In other words, the society is facing a shortage of goods and needs more production, and the conditions are such that based on that, the satisfaction that the producer can get for life after death by increasing one unit of production is more than It is the satisfaction that a person loses from the reduced remainder of profit from that unit of production (to spend in the life of this world or in the way of God). In this case, he determines the optimal point of his production by optimizing between the satisfaction of spending the remainder of profit (for life in this world or for life after death) or increasing production. Based on this, the satisfaction function of the producer is as follows:

(70) $$U = U(\pi, Q)$$

With the assumption that the marginal satisfaction of the Remainder of profit and the marginal satisfaction of production for God (Q) is positive and decreasing. Also, the second partial derivative of each of these is also negative. Their cross partial derivative is also positive. For the profit function of the producer, we have the following function:

(71) $$\pi = TR(Q) - TC(Q)$$

Based on this, the objective function of the producer will be:

(72) $$Max: U = U(\pi, Q)$$
$$S..to: m\pi = TR(Q) - TC(Q)$$

Based on this function, the producer's satisfaction level for profit and production size is clarified and can enter into his decision. Here, the producer has no costs other than the cost of production. To show these conditions, we assume that the mentioned producer has the marginal and average cost curves of MC and ATC and the fixed price P in figure 13 without incurring any costs in God's way. Based on that, the producer equates the marginal cost (MC) with the marginal revenue (P price) to clarify the optimal production size, which is the point f1. At this point, the optimal production size is equal to q1. Here the producer's total revenue is pq1, his total cost is g1q1 and his profit is equal to (p-g1)q1. This profit is the area inside the square g1ph1q1 (hatched).

As it was said, if the producer does not have a separate cost in the production process, the average cost of production will remain the same as the ATC curve and the marginal cost of production will remain the same as MC. But against this, production also brings God's reward for the producer. If we consider AFA equal to

the Monetary value of this reward or its satisfaction for each production unit (the average of this Monetary value), then this value increases the average real revenue of the producer at each point of production by this much and the average real revenue curve The producer is like the ATRA line. Here too, if the producer wants to produce at the optimal point, he must choose his production at a point where his real marginal revenue is equal to his marginal total cost. Based on what we said before, we have:

(73) $MR + MFA = MC + MCA$

(Or) $MTRA = MTCA$

Because in this production process, the producer does not have to cost in God's way, MTCA becomes equal to MTC. Based on this, we will have:

(74) $MR + MFA = MC + 0 = MC$

In other words, we have:

(75) $MTCA = MC$

On this basis, in order to optimize the size of production, this producer equals the real marginal revenue of production to the marginal monetary cost. For optimality we will have:

(76) $MTRA = MC$

On the figure, this point will be f_1 where optimal production is equal to q_1. By producing q_1 we have:

The marginal cost of production is equal to P and is shown on the MC curve by point f_1.

The average total cost of production is equal to g_1 and is represented by point h_1 on the ATC curve.

The total cost of production is equal to $q_1 \times g_1$ and is represented by the area of the square $og_1h_1q_1$.

The producer's marginal monetary revenue is equal to P and is shown on the MR line by point f_2.

The average sales revenue (average monetary revenue) of the producer is equal to P and is shown on the MR line with point f_1.

The real revenue of the producer is equal to $q_1 \times p_2$ and is represented by the area inside the rectangle $op_2f_2q_1$.

The average real revenue of the producer is equal to p_2 and is shown on the ATRA line by point f_2.

The producer's marginal real revenue is equal to p_2 and is shown on the MRTA line by point f_2.

The monetary profit of the producer's sale is equal to $(p-g_1)\times q_1$ and is shown by the area inside the square $g_1pf_1h_1$ (grey). The average monetary profit is equal to $p-g_1$.

The producer's real profit is equal to $(p_2-g_1)q_1$ and it is represented by the area inside the square $g_1p_2f_2h_1$ (gray + striped). Average real profit is equal to p_2-g_1.

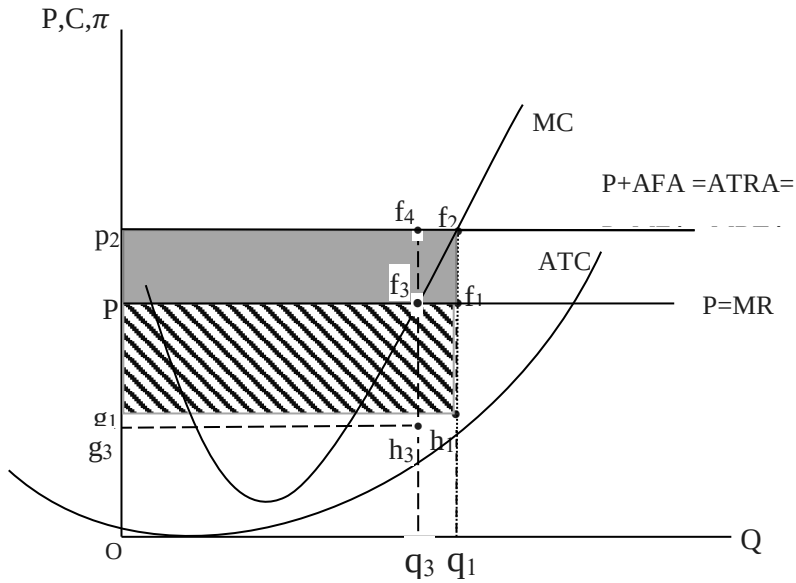

Figure 13: Optimum for the producer where increased production involves the satisfaction of God

In this assumption, the producer has more than the amount of production with the maximum profit (unsatisfied with life after death). The output of this producer is equal to q_2. But if this producer only equals the marginal monetary cost with the marginal monetary revenue of production, he would set the optimal point as f_3. At this point, production is equal to q_3, which is less than q_1. The production in q_1 is more than optimal based on the equality of the marginal monetary cost and the marginal monetary revenue. In other words, the total monetary profit of the producer is not the maximum, but when the producer believes in God's reward and brings, he brings the satisfaction he gets from it into decision making, assuming this example, he increases the production, and his optimum in producing more is like q_1. In other words, here the

satisfaction that the producer gets from production (for the life of this world and the life after death) is maximum and it is more than the assumption of God's displeasure.

Conclusion

In this article, first we defined the new word, and by looking at the literature Review of the theory of Muslim productive behavior, we took the general framework of Ezzati's paper (2009) and by expanding it, we analyzed how the effect of belief to life after death and efforts to achieve to the satisfaction of God and the subsequent achievement of God's reward in life after death affects the producer's behavior. We analyzed and showed how the satisfaction obtained for life after death accumulates with the satisfaction of profit and monetary revenue and forms the optimum of the producer. We also analyzed and showed how this belief affects real revenue, real profit and costs, and makes his production size different from the production size when his only goal is to maximize monetary profit.

The analysis presented in this article shows the behavioral structure of the believing producer, and using the knowledge gained from these discussions, it is possible to explain appropriate policy frameworks in the field of behavior of producers who believe in life after death. It can be used in Islamic society. Of course, the discussion of how this policy is made and its discussions require another independent and detailed article.

References

Abbas, A. R. B. M. (1995). Islamic economics: A psycho-ethical paradigm. *Al-Ta'sil, 2*, 116–123.

Akhtar, M. R. (1992). An Islamic framework for employer-employee relationships. *The American Journal of Islamic Social Sciences, 9*(2), 202–218.

Akhtar, M. R. (1993). Modelling the economic growth of an Islamic economy. *The American Journal of Islamic Social Sciences, 10*(4), 491–511.

Ali, M. Y. (1980). Optimal utilization of resources and maximization of production in Islam. In *Thoughts on Islamic Economics* (pp. 218–227). Islamic Economics Research Bureau.

Arief, M. (1982). Ethics and economics in Islam. *Islamika, 2*, 97–113.

Ariff, M. (1997). The role of the market in the Islamic paradigm. *IIUM Journal of Economics and Management, 5*(2), 97–107.

Bendjilali, B., & Taher, F. B. (1990). A zero efficiency loss monopolist: An Islamic perspective. *The American Journal of Islamic Social Sciences, 7*(1), 219–232.

Dar, M. I. (1988). Islamic economic system. *Journal of Islamic Banking and Finance, 5*(3), 37–51.

Ezzati, M. (2003). Explaining the effect of faith on consumer behavior. *Islamic Economics Quarterly, 11*, 11–34. (In Persian)

Ezzati, M. (2005). Faith, rationality and satisfaction. Economics Research Center. (In Persian)

Ezzati, M. (2010). Explanation of the theory of Muslim producer behavior. *Islamic Economics Quarterly, 39*, 35–62. (In Persian)

Faruqi, I. R. (1983). Tawhid: The principle of the economic order. *Tawhid for Thought and Life, 1*, 187–222.

Gusau, S. A. (1988). The nature and methodology of Islamic economics. In R. Islam Molla, A. R. Moten, S. A. Gusau, & A. A. Gwandu (Eds.), *Frontiers and mechanics of Islamic economics*. University of Sokoto.

Hallaq, S. (1995). Rationality in production: The case of the Muslim firm. *Humanomics, 11*(4), 29–38.

Hasan, Z. (1975). *Theory of profit*. Vikas Publishing House. (Out of print)

Hasan, Z. (1983). Theory of profit: The Islamic viewpoint. *Journal of Research in Islamic Economics, 1*(1), 1–16.

Hasan, Z. (1992). Profit-maximization: Secular versus Islamic. In S. Tahir, A. Ghazali, & S. O. S. Agil (Eds.), *Readings in microeconomics: An Islamic perspective* (pp. 141–225). Longman.

Hasan, Z. (2002). Maximization postulates and their efficacy for Islamic economics. *American Journal of Islamic Social Sciences, 19*(1), 95–118.

Hasan, Z. (2008). *Theory of profit from Islamic perspective* (MPRA Paper No. 8129). Munich Personal RePEc Archive.

Iqbal, M. (1992). Organization of production and theory of firm behavior from an Islamic perspective. In A. Ahmad & K. R. Awan (Eds.), *Lectures on Islamic economics* (pp. 205–215). Islamic Research and Training Institute, IDB.

Kahf, M. (1978). The theory of production. In *The Islamic economy: Analytical study of the functioning of the Islamic economic system* (pp. 29–38). The Muslim Students' Association of the United States and Canada.

Metwally, M. M. (1992). A behavioral model of an Islamic firm. In S. Tahir, A. Ghazali, & S. O. S. Agil (Eds.), *Readings in microeconomics: An Islamic perspective* (pp. 125–131). Longman.

Metwally, M. M. (1997). Economic consequences of applying Islamic principles in Muslim societies. *International Journal of Social Sciences, 24*(7–9), 941–957.

Mirmoezi, S. H. (2012). Theory of producer behavior and labor demand in Islamic economy. *Islamic Economy Quarterly, 13*, 103–134. (In Persian)

Mohd. Amin, R., & Yusof, S. A. (2003). Allocative efficiency of profit maximization: An Islamic perspective. *Review of Islamic Economics, 13*, 5–22.

Mohd. Amin, R., & Yusof, S. A. (2007). A survey on the objective of the firm and models of producer behavior in the Islamic framework. *J.KAU: Islamic Economics, 20*(2), 3–16.

Naqvi, S. N. H. (1981). Economics of human rights: An Islamic perspective. *Hamdard Islamicus, 4*, 31–51.

Naqvi, S. N. H. (1997). The dimensions of an Islamic economic model. *Islamic Economic Studies, 4*(2), 1–24.

Al-Safar, A. K. (1998). Use of non-linear programming in achieving equilibrium of an Islamic firm. *Humanomics, 14*(2), 74–89.

Siddiqi, M. N. (1979). *The economic enterprise in Islam* (2nd ed.). Islamic Publications.

Siddiqi, M. N., & Others. (1992). Islamic producer behavior. In S. Tahir, A. Ghazali, & S. O. S. Agil (Eds.), *Readings in microeconomics: An Islamic perspective* (pp. 131–138). Longman.

Zaim, S. E. (1979). Islamic economics as a system based on human values. *Journal of Islamic Banking and Finance, 6*(2), 13–21.