Optimizing Input and Output under the Scheme of *Mudharabah*

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Abstract: *The research will elaborate producer behavior, specifically on input and output optimization under* mudharabah *scheme that will determine income distribution. We used calculus to derive propositions.* **Mudharabah** *economic principle shows that the increase in* **mudharib's barakah** *(blessing) due to the increasing amount of labor in a* **maslahat** *manner is equal to the* **maslahat** *value of net marginal product of labor. The increasing* **mudharib's barakah** *due to the increasing amount of raw material used in a* **maslahat** *manner equals to the* **maslahat** *value of net marginal productivity of raw material. The proposition related to wage level shows that wage level determined simultaneously by* **musyatarak akad** *(contract) reflects the value of net labor productivity weighted by* **mudharib's** *share of profit sharing. The higher certification cost per product unit, the lower the wage level. The increasing share of profit sharing for* **mudharib** *from* **shahibul maal** *will increase wage level. Increasing the share for* **mudharib** *from profit sharing by* **shahibul maal** *will increase the wage level per worker. Profit sharing contract between* **mudharib** *and* **shahibul maal** *highly determines wage level. In the agreement, both parties should calculate the impact of shares on labor wage.*

Keywords: Producer Behavior, Factor Pricing, *Mudharabah*, Profit Share

1. Introduction

Income inequality is a crucial problem encountered by Muslim countries, including Indonesia. The popular indicator reflecting income inequality, the Gini Ratio, shows a quite alarming increase, especially in Indonesia. In 2008, the Gini ratio was only 0.38, while in the end of 2013, it reached 0.41. The increase means that income distribution is increasingly unequal. Various approaches and policies adopted from conventional economic framework have been attempted to be applied. Unfortunately, they did not work as expected, so that other breakthroughs able to ensure improvement in income distribution should be found.
Islam provides a comprehensive spectrum in directing human behaviors, both as individual and social beings, in performing economic transaction among economic actors. Several previous writings and research results in the scope of *fiqh* discipline of science, such as one by Chalil (2009), have elaborated the sources of Islamic teachings, namely Al-Qur'an and Hadith, in order to find concepts pertaining to equal wealth distribution. Chalil's findings inform that Islamic teachings introduce two kinds of primary distribution systems of income, namely commercially, which follows market mechanism; and one that relies on the aspect of social justice (non-market mechanism). The market mechanism version is related to revenue for the owners of production factors, namely salary or wage, land leasing, and profit; while the non-market mechanism pertains to *zakat* (alms), *infaq*, and *shadaqah* (Chalil, 2009).

In certain literature of development economics, such as Nafjiger (1997), Hayami (2001), Todaro (2012), the market mechanism version is familiarly termed functional income distribution or income distribution among owners of production factors. To understand factor prices and income distribution, demand for factors of production should be tested. Because the demand factors emerge from a number of companies using capital and labor, then the decision taken by certain companies in exploiting the factors should be

examined (Mankiw, 2000), so that maximal output can be obtained.

The present research will explore ways to internalize Islamic values into decision makings of Muslim businessmen in determining the amounts of optimal input and output under *mudharabah* scheme. *Mudharabah* is one of the forms of *syirkah* (business cooperation) between *shahibul maal* (capital owners) and *mudharib* (fund managers) restrained by several agreements in the framework of Islamic values.

2. Literature Review

2.1. The Theory of Producer Behavior

In production process, each company is posed with three decisions, namely how much output is to be offered? What kind of technology will be used? and, how much is the demand for inputs? (Case & Fair, 2010). Demand for an input is a type of demand derived from the demand for the resulted output. Companies will use inputs or factors of production up to the level where maximum profit is achieved. Profit in this case is economic profit, namely the difference between Total Revenue (TR) and Total Cost (TC), covering explicit and implicit costs (Frank, 2008; Sukirno, 2002). TR and TC are each a function of the same variable, namely the amount of output resulted (Q). Through a mathematical expression, it will be proven that the maximization of profit is achieved when marginal revenue is equal to marginal cost. Producer behavior theory in conventional economic perspective is condensed with marginal concept, profit maximization, and cost minimization. Islamic teachings have a disparate perspective. According to Choudhury, Islamic economy is laden with ethics originating from Al-Qur'an and Hadith. Production level to meet social needs is related to or limited by rules, both from the aspects of production and consumption, and the necessity of just distribution. The average production will ensure the achievement of social production level. Hence, the classical economic case of "free

entry free exit" in an Islamic market is determined by the achievement of minimum level of production needed by the society (Choudhury, 1986).

There have been abundant thoughts of Muslim economists on producer behavior, describing the ideal corporate operations framed in Islamic norms. The articles that technically discuss production behaviors are those by Amin (2003), Yusof (2007), and Metwally (1992). The three share different specifications and contribute to the development of theories of Islamic microeconomics. Metwally (1992) studies the implications of Islamic laws on Muslim producer behavior. He builds his assumption first, and by using differential calculus approach, he builds a mathematical model explaining economic problems of Muslim producer, namely maximizing utilities with the constraint of net profit after spending for *zakat* and tax. The proposition he issues explains the optimal amount of production output and output marketing strategies. Unfortunately, it is not in accordance with the expectation of the article's title, where Metwally (1992) does not elaborate on the discussion of optimal input allocation to support the achievement of optimal production output.

Maximizing profit is the basic assumption in corporate theory, and it has received critiques because it is not consistent with Islamic behaviors. However, according to Yusof (2007), the principle is applied in Islamic economic framework to ensure allocative efficiency, namely the production of the right goods in the right quantity. Allocative efficiency can be achieved if in the assessment of opportunity cost the corporate takes into account the properties of goods to be produced according to Islamic ethical values. The calculation of opportunity cost is different from the conventional one. According to him, opportunity cost should consider the *maslahat* of a good produced. He then builds a theory explaining the economy of conventional and *sharia* companies in a perfect and imperfect market competition. However unfortunately, Yusof (2007) also does not discuss in detail optimal input and output allocation.

2.2. The Definition of *Mudharabah*

Syara' mudharabah is defined as *akad* (contract) between two parties to cooperate in trading business, where one of the parties provides for the other fund as business capital, and profit of the business will be shared among the parties making agreement according to the approved agreement (Zuhaili, 1984). An-Nabhani (2010) highlights the definition of *syirkah mudharabah* as a business partnership between a property partner and a body partner. This means that one hands his or her property to the other party to be managed into a business, with a provision that the profit gained will be shared between them according to the agreement. An-Nabhani (2010) further explains that when a loss occurs beyond the manager's control, the burden of the loss is upon the capital owner, considering the status of the *syirkah* is the same as *wakalah* (representation). Legally, a representative cannot be the party bearing the loss. The loss is solely upon the party who hands the representation. Abdurrazaq in the book of Al-Jami has narrated the story from Ali (May Allah be pleased with him), saying: The loss is upon the property,

while profit is according to what has been stipulated (Hadith narrated by Abdurrazaq). Thus, the body does not bear the property loss, other than the loss in the form of labor. This means that the loss in the form of money is solely upon prices.

3. Research Method

The present research is basic/pure research, elaborating the normative framework related to Islamic producer behavior contained in Al-Qur'an and Hadith, followed by introducing the elaboration into the existing conventional economic theories. To analyze the meanings of certain words from Al-Qur'an, the technique used was content analysis, conducted qualitatively (Chalil, 2009). Content analysis is an effort of examining the meanings of the content of a form of information in the forms of document, poetry, painting, written speech, normative text or law (Babbie, 1980). It attempts to research ideas, concepts, and values of various thoughts that will be made into inference through efforts of finding the characteristics of messages, and it is done objectively and systematically.

Inference is made by combining inductive and deductive as well as comparative methods. The deductive method was employed to analyze principles and or content of Islamic producer behavior concept, namely taking an inference specifically based on general characteristics. The inductive method was used to collect various views of Muslim economic experts on the problem under research. Finally, comparative method was deployed to compare the concept of Islamic producer behavior in Islamic economic concept and in conventional economic concept. In developing the inductive method, a special interview and focus group discussion were carried out with related competent informants.

To get the behaviors of Muslim businessmen reported to have applied Islamic business practices, a survey to a number of businessmen was done.

4. Results and Discussion

The internalization of Islamic values into the decision made by Muslim businessmen in determining the optimal amounts of input and output under *mudharabah* scheme is presented in a model framework illustrated in Figure 1.
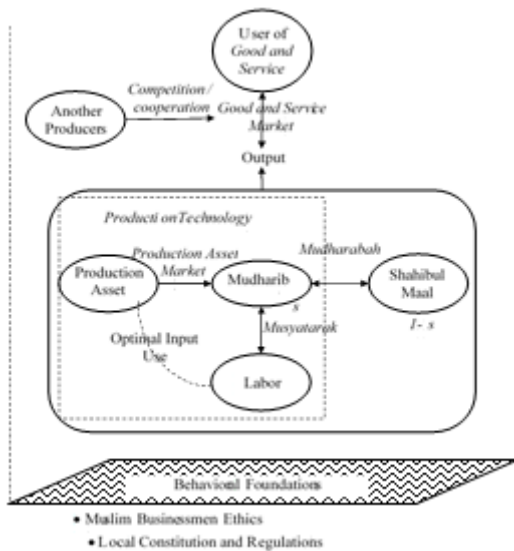
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Figure 1: Generic Model of Producer Behavior Under Mudharabah Scheme

The decision for optimal input use is a technical one for Muslim businessmen. It considers the following aspects:
a. Islamic Ethics.
b. Compliance with local constitution and regulations (agreement between the communities/government officials).
c. The choice of contract of *mudharabah* with *shahibul maal* (when necessary).
d. The choice of *musyatarak* contract with the recruited labor.
e. The production technology that is in the same package as production amount and cost.
f. Market structure considering competition or cooperation built with another producer.

With the six considerations above, it is expected that *barakah* will be achieved, in which the business process will fulfill the *rukun maslahat* (the pillars of goodness). It is these pillars of *maslahat* that will be theorized more operationally. For example, to guarantee the *halal*-ness of the output produced, a Muslim entrepreneur is required to spend certification cost paid to *Majelis Ulama Indonesia* (The Council of Indonesian Ulama) and BPPOM (National Agency of Drug and Food Control). Here, it is assumed that certification cost is per unit output. Labor management should consider humanity norms. It means not to position labor as machine or other factors of production. Business management should take into account environmental sustainability that will be affected by the undesirable output. The internalization of these norms is the prerequisite to claim that the business is *maslahat,* and it is also the requirement to meet of the main goal, namely Allah swt.'s *barakah* (blessing).

Following is the mathematical expression of Muslim producer's efforts to reach maximal *barakah*. It is assumed that there are two parties involved in a *mudharabah* contract, namely *shahibul maal* (SM) and *mudharib* (Md). *Shahibul Maal* has the capital and *Mudharib* has the ability to manage the business. Both of them use the kind of *akad mudharabah* with a time-scale for two production periods. *Mudharib* spends the capital of *Shahibul Maal* to purchase production inputs in the variables of labor (H) and raw materials (F).

Between the *mudharib* and labor, *musyatarak* contract is used. In addition, the goal of both parties in the business is to gain *barakah* from Allah swt with the expectation of quantifiable benefit.
The goal of blessing maximization:

$$B_1 = B_1^{sm} + B_1^{md} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..(1)$$
$$B_1^{sm} = s(\pi_1^m) \ldots\ldots\ldots\ldots..\ldots\ldots\ldots(1a)$$
$$B_1^{md} = (1-s)(\pi_1^m) \ldots\ldots\ldots\ldots\ldots...\ldots..(1b)$$

Where :
B_1 = *barakah* (blessing) targeted jointly in the first period.
B_1^{sm} = *barakah* targeted by *shahibul Maal* (SM) in the first period.
B_1^{md} = *barakah* targeted by Md in the first period.
From the point of view of *mudharib*, the desired *barakah* is $B_1^{md} = (1-s)(\pi_1^m)$, which is gained through the condition expressed in equation (2). The profit is the difference between revenue (TR^m) and expenditure (TC^m) that are *maslahat*.

$$(1-s)(\pi_1^m) = (1-s)[TR_1^m - TC_1^m] \ldots\ldots..(2)$$
$$TR_1^m = P_1^m Q_1^m ..\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(2a)$$
$$Q_1^m = H_1^a F_1^{b\ldots} \ldots\ldots\ldots\ldots..\ldots\ldots\ldots(2b)$$
$$TC_1^m = wH_1 + vF_1 + nQ_1^m + Z_{1\ldots}\ldots\ldots.\ldots (2c)$$

Where:
H_1 = The amount of labor in the first business period;
F_1 = The number of raw materials in the first business period;
Q_1 = The amount of output in the first business period;
Z_1 = The value of *zakat*, *infaq*, *shadaqah* (ZIS) spent in the first business period;
w = The wage level per unit labor determined by *akad musyatarak*;
v = price per unit of raw material;
n = certification cost per unit output.

Equation (2a) displays an expression of *maslahat* income, namely *maslahat* production value, resulted from the multiplication of output price sold in a *maslahat* manner (P_1^m) and the amount of output produced in a *maslahat* manner (Q_1^m). Cursorily, the difference seems to be attaching the word "*maslahat*" into the basic economic theory. However, the word *maslahat* is translated operationally by Md not frivolously, until eventually it should be reflected in the cost structure. The argument will look different in the cost equation.

In equation (2c), it is displayed the equation for production cost. In the equation, it can be seen that the pillars (*rukun*) of *maslahat* are fulfilled by Md. Md spends money to fund labor with the wage level agreed upon in the *musyatarak* contract, provides *maslahat* inputs, spends for the cost of product's *halal* certification, and spends for ZIS.
Substituting equations (2a), (2b) and 2(c) into equation (1b) broadens the definition of *barakah* of Md, as is displayed in equation (1b'):

$$B_1^{md} = P_1^m Q_1^m - wH_1 - vF_1 - nQ_1^m - Z_1 \ldots\ldots (2)$$

The definition of *barakah*/blessing expected to be obtained from two production periods, from the point of view of *mudharib*, is presented in equation (1b"):

$B^{md} = (1\text{-}s)\ (B_1^{md} + B_2^{md})$

$B^{md} = (1\text{-}s)\ [P_1^m Q_1^m - wH_1 - vF_1 - nQ_1^m - Z_1 + P_2^m Q_2^m - wH_2 - vF_2 - nQ_2^m - Z_2]$

$B^{md} = (1\text{-}s)\ [P_1^m H_1^a F_1^b + P_2^m H_2^a F_2^b - wH_1 - wH_2 - vF_1 - vF_2 - nQ_1^m - nQ_2^m - Z_1 - Z_2]$ ……………………………… (1b")

Equation (1b") provides explanation that the *barakah* of Allah swt is obtained by Md from the profit, after taking into account the *maslahat* of product selling, the *maslahat* of the labor, and the *maslahat* of raw material supplier as well as social *maslahat*.

The economic principles of *mudharabah* can then be explored from the first derivation of equation (1b"):

▪Max:

$B^{md} = (1\text{-}s)\ [P^m H_1^a F_1^b + P^m H_2^a F_2^b - wH_1 - wH_2 - vF_1 - vF_2 - nQ_1^m - nQ_2^m - Z_1 - Z_2]$

▪Max:

$B^{md} = (1\text{-}s)\ [P^m H_1^a F_1^b + P^m H_2^a F_2^b - wH_1 - wH_2 - vF_1 - vF_2 - n H_1^a F_1^b - n H_2^a F_2^b - Z_1 - Z_2]$

The first derivation, with respect sequentially to the variables of H, F, and Q are presented in equation (3):

$\partial B^{md}/\partial H_1 = (1\text{-}s)\ [P^m Q_1^m/H_1] - w - [n^m Q_1^m/H_1] = 0$ …… (3a)
$\partial B^{md}/\partial H_2 = (1\text{-}s)\ [P^m Q_2^m/H_2] - w - [n^m Q_2^m/H_2] = 0$ …… (3b)
$\partial B^{md}/\partial F_1 = (1\text{-}s)\ [P^m Q_1^m/F_1] - v - [n^m Q_1^m/F_1] = 0$ ……… (3c)
$\partial B^{md}/\partial F_2 = (1\text{-}s)\ [P^m Q_2^m/F_2] - v - [n^m Q_2^m/F_2] = 0$ ……… (3d)

Equation (3) proposes *mudhrabah* economic principles as follows:
(1) The increasing *barakah* of *mudharib* as an effect of the increasing amount of labor in a *maslahat* manner, $\partial B^{md}/\partial H_1$, is equal to the *maslahat* value of net marginal productivity of labor, namely after it is subtracted by wage per unit of labor and marginal value of product's certification cost per unit of labor. Labor can be seen to have contribution to the certification of product's *maslahat* (*halal*-ness).
(2) The increasing *barakah* of *mudharib* as a result of the use of raw material in a *maslahat* manner, $\partial B^{md}/\partial H_1$, is equal to the *maslahat* value of net marginal productivity of raw material, namely after getting subtracted by price per unit of raw material and the marginal value of product certification cost per unit of labor.
Points (1) and (2) are the main principles of *mudharib* to achieve *barakah*. The principles are known as equimarginal principle in basic theories of microeconomics. In the development of the model, advancement of the basic theory is presented after theorizing the institution of *mudharabah* contract. Islamic sharia is postulation. Here, we have to explain a potential question that might surface: why is the postulation re-theorized to get the proposition? The postulation in this context is a Muslim's obligations, but in the theorization context it becomes the norm that will shape theoretical behaviors of Muslim businessmen, so that the

causal for the argumentation of the postulation's procedure in the institution of *mudharabah* economy can be explained.

Mudharib's decision to use optimal labor, raw material, and product certification will refer to the principles. Hence, *mudharib* will produce optimal output, which is implicitly presented in equation (4). The optimization has passed through sacrifice in order to gain *maslahat*.

$Q_{1,opt}^{m} = H_{1,opt}^{a}\ F_{1,opt}^{b}$ ………………………..(4)

From the optimization of production, a proposition related to income distribution can be derived. The optimization can be used to explore information concerning considerations of wage level and the price of other factors of production. For the variable of wage level, the proposition can be explored from equations (3a) and (3b), which are rewritten as follow:

$\partial B^{md}/\partial H_1 = (1\text{-}s)[P^m Q_1^m/H_1] - w - [n^m Q_1^m/H_1] = 0$

If the variable of w is moved to the right side of the equation, it will produce the following equation (5):

$w = (1\text{-}s)[P^m Q_1^m/H_1] - [n^m Q_1^m/H_1]$ …..……..(4)

The proposition concerning wage level can be explained as follows:
(1) The wage level determined together through *musyatarak* contract reflects the net productivity value of labor weighted by the shares of profit sharing gained by *mudharib*;
(2) The higher the certification cost per product unit, or the higher *n*, the lower the wage level;
(3) The higher the level of marginal physical productivity of labor, or Q_1^m/H_1 increases, the higher the wage level;
(4) Increasing the shares of profit sharing for *mudharib* by *shahibul maal* will increase wage level per unit of labor;
(5) The contract for shares of profit sharing between *mudharib* and *shahibul maal* highly determines wage level. In the contract, both parties should calculate the impact of their shares on labor wage.

5. Conclusion

Based on the resulted propositions, it can be generalized that the prosperity of economic actors working through *mudharabah* and *musyatarak* contracts becomes mutual responsibility. The contract of shares of profit sharing between *shahibul maal* and *mudharib* has an impact on labor earnings. The same is true for *musyatarak* contract. Income distribution is not independent from the contract made by economic actors. It translates as social welfare being able to be achieved through business planning, not "business as usual."

References

[1] Amin, R. M & Yusof, S. A, "Allocative Efficiency of Profit Maximization: An Islamic Perspective", *Review of Islamic Economics'*, No. 13, pp. 5-21, 2003.

[2] An-Nabhani, Taqiyuddin, Sistem Ekonomi Islam, Hizbut Tahrir Indonesia Press, 2010.

[3] Babbie Earl, The Practice of Social Research, Wardswort Publishing, 1980.u

[4] Case, Karl & Ray Fair, Principles of Economics. Prentice Hall Business Publishing, 2002.

[5] Chalil, Zaki Fuad, Pemerataan Distribusi Kekayaan Dalam Ekonomi Islam, Penerbit Erlangga, Jakarta, 2009.

[6] Choudhury, M. A, "The Micro-Economics Foundation of Islamic Economics: A Study in Social Economics", The American Journal of Islamic Social Sciences, Vol. 3 No. 2, pp. 231-245, 1986.

[7] Frank, Robert H, Micoreconomics and Behavior, Seventh Edition, Mc Graw Hill International Edition, 2008.

[8] Hayami Yujiro, Development Economics from the poverty to the wealth of nations, second edition, Oxford University Press, 2001.

[9] Mankiw, N. Gregory, Macroeconoomics. Fourth Edition, Worth Publishers, 2000.

[10] Metwally, M. M, "A Behavioural Model of an Islamic Firm", International Centre for Research in Islamic Economics, Research Series in English No. 5, pp. 1-16, 1981.

[11] Nafjiger, E. Wayne, The Economics of Developing Countries, Prentice-Hall International (UK) Limited, London, 1997.

[12] Soekirno, Sadono, Pengantar Teori Mikroekonomi, Edisi Ketiga, PT Raja Grafindo Persada, Jakarta, 2002.

[13] Todaro, M.P, and Smith, S.C. 2012. Economic Development. Eleventh Edition. Pearson Education Limited. www. pearsonhighered.com

[14] Yusof, S. A., & Amin, R. M, "A Survey on the Objective of the Firm and Models of Producer Behavior in the Islamic Framework", *Journal of King Abdulaziz University: Islamic Economics, pp. 3*-16, 2007.

[15] Zuhaili, Wahbah, *Fiqh al-Islam Wa Adillatuhu*, Beirut: Daarul Fikr, Jilid IV, 1984.

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