Available online at: http://journal.uinsgd.ac.id/index.php/ijik
IJIK, Vol. 14 No. 2: 70-85
DOI: 10.15575/ijik.v14i1.31300

Optimizing the Money Demand Function in Islamic States with Insights from Milton Friedman

Yuda Septia Fitri[1]*, Vemy Suci Asih[1], Dudang Gojali[1]
[1]UIN Sunan Gunung Djati Bandung, Indonesia
*Corresponding Author E-mail: yuda.fitri1@uinsgd.ac.id

Abstract

This study aims to develop a comprehensive model of money demand in Muslim countries. The methodology employed is a combination of qualitative and quantitative methods. The qualitative approach involves an extensive literature review of microeconomic theory, particularly the theory of marginal utility, Muslim consumption patterns, and macroeconomic theory regarding the factors influencing money demand. These theories help construct a robust model of money demand in an Islamic context. The quantitative approach verifies the proposed model using multiple linear regression analysis. This analysis examines the relationship between money supply, GDP, the rate of return on sukuk, and the collection of zakat, infaq, and charity in Indonesia over a period of 10 years. Key elements of the model include the integration of Islamic financial principles such as zakat, infaq, and charity, which are shown to have a positive relationship with the demand for money. The significance of using a mix of qualitative and quantitative methods lies in the ability to build a theoretical framework grounded in Islamic economic principles and empirically validate it with real-world data. The qualitative aspect provides a deep understanding of the specific theories and literature, including the works on marginal utility and Muslim consumption behaviors, which are crucial for modeling money demand in Islamic economies. The study's findings are particularly important as they reveal a positive relationship between the collection of zakat, infaq, and charity, and the demand for money. This suggests that these Islamic financial instruments play a significant role in shaping money demand, highlighting the unique dynamics of Islamic economies. By integrating these elements, the study provides valuable insights into the financial behaviors in Muslim countries and underscores the importance of incorporating Islamic principles in economic models. This research contributes to a better understanding of how Islamic financial practices influence economic stability and growth, offering a pathway for developing effective monetary policies in Muslim countries.

Keywords: GDP, Infaq, Marginal Utility, Money Demand, Sukuk, Zakat.

INTRODUCTION

Understanding the demand for money within the context of monetary policy in Muslim countries is crucial for achieving economic stability and growth (Ahmad et al., 2024; Darrat, 1984). Despite extensive research on money demand in developed and developing countries (A. A. Hossain, 2016), there is a significant gap in the literature concerning money demand in Muslim countries. This paper aims to address this gap by exploring various dimensions of money demand in these countries.

Existing literature rarely addresses money demand in Muslim countries, even though it is essential for achieving economic stability in accordance with Islamic principles (M. F. Khan & Jabeen, 2020; Zauro et al., 2020). This gap indicates that many monetary policies in Muslim countries may not be based on a comprehensive understanding of how money demand functions

Received: September 15, 2023; Revised: December 28, 2023; Accepted: October 1, 2024

in this context. Addressing this gap is crucial for developing effective monetary policies that align with Islamic economic principles. This research contributes to filling this gap by providing empirical evidence and theoretical insights into money demand in Muslim countries.

Friedman, a prominent economist, asserted that monetary policy can contribute to achieving economic stability by preventing uncontrolled movements of monetary aggregates (Bhar & Malliaris, 2021; Nelson, 2020), which can trigger economic instability, and by anticipating instability caused by non-monetary factors (Galbács, 2015). According to Friedman, controlling monetary aggregates is key to maintaining economic stability. It is essential to ensure that changes in the money supply do not cause significant economic fluctuations that can lead to instability (Edwards & Montes, 2020; Rivot, 2017).

Transitioning from the general importance of money demand, we now focus on how Islamic economics implements monetary policy. In Islamic economics, fluctuating cash reserves—not interest rates—are used to formulate monetary policy (Ireland, 2022). The Islamic monetary system aims to increase the money supply to a level that can support potential increases in output prices (Edwards & Montes, 2020; B. Hossain, 2020). This is achieved through policies that encourage higher money circulation while maintaining moral values and societal welfare. The goal is to ensure appropriate monetary expansion that can generate equitable growth and prosperity for society (Nurnasrina, 2013).

This paper has several specific objectives. First, it investigates the history of monetary policy implementation during the time of the Prophet to understand how these policies were applied and their impact on economic stability. Second, it compares theoretical aspects of money demand from conventional and Islamic approaches to identify differences and similarities. Third, it analyzes the Basic Theory of Money, the Classical Mainstream Theory of Money Demand, the Theory of Money Demand in the Islamic Concept, and the concept of Money Demand in a Financial Dual System to provide a comprehensive theoretical framework. Fourth, it empirically investigates money demand in selected Muslim countries to provide data-driven insights. Fifth, it constructs a model of money demand in Islamic countries to predict and analyze future trends. Finally, it discusses the factors influencing money demand policies in Muslim countries and their implications. By addressing these objectives, this research aims to provide a comprehensive understanding of money demand within the context of Islamic economics and contribute to the existing body of knowledge.

The methodology used in this research is a mix of qualitative and quantitative methods. The qualitative approach involves a literature review to study the definitions of key terms and deepen the understanding of microeconomic theories, such as marginal utility, Muslim consumption, and macroeconomic theories regarding factors influencing money demand in a country to build an Islamic state money demand model. The literature review draws from previous research journals. The quantitative approach verifies the model created by researchers through multiple linear regression analysis between the money supply, GDP, bond return rates, and the collection of zakat, alms, and infaq in Indonesia over ten years related to the background and research context.

The structure of this paper consists of three main sections. The first section is the introduction, which presents the background, research objectives, literature gap, and research methodology. The second section is the results and discussion, which covers the Basic Theory of Money, the History of Monetary Policy at the time of the Prophet Muhammad, Classical Mainstream Theory of Money Demand, Theory of Money Demand in the Islamic Concept, Money Demand in a Financial Dual System, and Money Demand in Some Islamic Countries, investigating money demand in

selected Muslim countries based on empirical data. This section also involves constructing a model of money demand in Islamic countries and discusses the factors influencing money demand policies in Muslim countries and their implications. The final section is the conclusion, which summarizes the research findings and provides recommendations for monetary policies in Muslim countries.

RESULTS AND DISCUSSION

Basic Theory of Money

Previously, we described some definitions related to money. Mankiw (2006) defines money as the stock of assets that can be readily used to make transactions.(Mankiw, 2006) Based on the type, the money can be divided into currency, demand deposits, and quasi-money. Currency is money that is used as a means of legitimate transaction and shall be accepted throughout society and the economy. Typically in the form of currency notes and coins, the central bank was given the sole right to print money (Abilawa & Siddiq, 2016). Demand deposits are bills on commercial banks that can be used as a means of payment. Transactions are legitimate, and people are not obliged to accept payment. Quasi-money is a security that can be used as a means of payment. This quasi-money consists of time and savings deposits and foreign currency accounts belonging to private.

Based on the calculation of the amount of demand for money in the community, money distinguishes between M0, M1, M2, and M3. M0 is currency; M1 is M0 plus demand deposits. M2 is M1 plus time deposits. M3, i.e., M2 plus long-term deposits, including funds from existing institutional money markets The bank, which can be withdrawn at any time if needed.

While Ascarya, Heni Hasanah, and Noer Azam Achsani make the definition different between M0, M1, and M2 in Islam (Ascarya & Achsani, 2008). The Islamic component of money supply in the narrow sense (M1ISL) is the currency and demand deposits in Islamic banks. Islam and components of money supply in the broad sense (M2ISL) are components of M1ISL, *Mudharabah* savings and deposits and investments *Mudharabah*.

Demand for money plays an important role in the conduct of monetary policy in any economy. As Al Ghazali stated in Ihya Ilimuddin, money is one of the favors of Allah and the sustainer of life in the world and should be used in accordance with the provisions of Personality '. Money has a role as a weapon that has the power to be of high value. Furthermore, Al-Ghazali stated that for anyone who has the money, it is like having it all (Wahyudi, 2013). The more money you have, the more the needs and desires can be fulfilled. Therefore, the money should be distributed equitably to all communities in the State through government intervention through monetary policy.

History of Monetary Policy at the time of the Prophet Muhammad

Islam is also very concerned about the country's economy and justifies all kinds of government action for the public good in Islamic law, called *al-Masalih al-mursalah*. The benefit of including it in the field of economic and monetary policy (Amri, 2018). In line with the opinion of Ibn Taymiyyah, the government is an institution that is needed to manage all the affairs of the community. Even religion cannot be enforced without the state (Muhammad, 2007).

According to Chapra, monetary policy will be crucial in assisting in the accomplishment of the objectives of the Islamic economic system. The Islamic economic system provides profit sharing between capital owners and business owners as an alternative to the system of interest in traditional economics. This revenue-sharing system, whether in the form of

Musharaka or *Mudaraba*, with several modifications, ensures fairness and leaves no one behind.

If the return of a conventional bank interest system as a percentage of the funds is set at the beginning of the transaction, the return of an Islamic bank sharing system is a sharing ratio as determined at the beginning of the transaction but a nominal value based on the income that would happen.

In encouraging growth and economic stability, Islam does not use interest instruments, monetary expansion by printing new money, or even the budget deficit, but by accelerating the velocity of money and infrastructure development in the real sector. The most important thing in finance is the determination of the financial base unit, which is the unit in which all currency values are assigned (Huda Et-Al Nurul, 2009).

Monetary policy is not just a problem of regulating interest rates because the interest always puts pressure on economic activities, and the self-interest of the banking system has a great influence on whether or not passionate and least healthy economic activities occur.

The Islamic government's initial center of financial control was Baitul Maal. The current funding allocation for Islamic expansion, education and culture, research, the construction of infrastructure, and the delivery of social welfare services The allocation of the Baitul Mal as a whole has an effect on economic growth. For example, the allocation for the spread of Islam has an impact on the aggregate increase in aggregate Supply Demand at the same time as the population grows and the most efficient use of natural resources. The growth of Islam also increased Baitul Mal's income.

The economy at the time was not underdeveloped, and people only knew barter. At that time, there was a foreign currency from the Persian and Roman empires known by all levels of Arab society and even used as a means to pay officials. Since a free foreign exchange system has been established, there is no obstacle at all to importing dinar and dirham. Cash transactions are not widely accepted among traders. Checks and Promissory notes are commonly used; Bin Umar Khottob uses this instrument when importing new goods from Egypt to Madinah. Even the factory instrument (debt factoring), newly popular in the 1980s, was known as Hiwalah, but of course, it is free from elements of usury (Karim, 2001a, 2001b).

At the beginning, the Islamic government made a policy to increase the demand for transactions on the money, but the money supply remains elastic. This is because there are no barriers to imports when demand for money rises. In those days, when the acceptance of money increased, the dinar and dirham were imported. Conversely, when the demand for money falls, the comodities imports (Wahyudi, 2013). On the other hand, excess supply would be converted into gold and silver ornaments. The impact is that there will be no excess supply or demand, and the market will remain in balance (Equibilibrium). Therefore, the value of money will always remain stable (Karim, 2001a)

Classical Theory of Money Demand Mainstream

In mainstream economics, there are two major streams of the theory of demand for money: classical flow and Keynes. Classic flow, starting with the quantity theory of money developed by Irving Fisher (1911). Irving Fisher developed a theory known as the Quantity Theory of Money (QTM). QTM theory is a theory that explains how the aggregate nominal value of income is determined by the equation:

$$M = \frac{1}{V} \text{ x PY}$$

M is the total quantity of money, V is the level of the velocity of money, P shows the overall price, and Y is the overall output (income). With this model, the demand for money is

purely a function of income, and interest is not having an effect on the demand for money (Mishkin, 2004).

In contrast to the classic, John Maynard Keynes saw that the flowers had a significant effect on the demand for money. To explain his view, Keynes explained the theory of liquidity preference. Keynes money demand model, developed later by James Tobin and William Boumol, is M / pd = f (i, Y) where Y i associated negative and positive touch (Branson, 1989).

In 1956, Milton Friedman developed a theory of money demand, which refers to the classical theory; however, in its analysis, Friedman is actually closer to Keynes. According to Friedman, the demand for money is influenced by the same factors that influence the demand for assets. Therefore, Friedman then developed the theory of asset demand and money. In this case, Friedman categorizes three types of assets that can be owned by individuals: bonds, equity (common stock), and goods.

Nevertheless, what distinguishes Friedman from Keynes theory is the assumption that interest has little effect on the demand for money. Keynes proposed that interest is an important factor in money demand, while classical economists assume that interest is not the main factor. This is because when there is an increase in interest, the banks will be keen to attract deposits from the public and eventually raise deposit interest or reproduce more compelling services for the public, so that the expected profit rate of the currency will rise.

Theory of Money Demand In the Islamic Concept

The legalization of monetary speculation has encouraged the development of money (currency, demand deposits, and the absorption of money) in the financial sector for risk-free profit. In order to prevent the growth of the monetary sector and even reduce the real sector, money or investments that should have been directed to the real sector for productive reasons generally fled. Inflation will result from the creation of money without any added value. The objective of economic expansion will ultimately be hindered.

Demand for money in the financial institutions of Islam is allocated only to projects that are beneficial or to borrowers who are able to manage projects efficiently (Siregar, 2000). Milton Friedman created a theory of money demand in 1956 that makes reference to the classical theory, but in terms of analysis, Friedman is actually more in line with Keynes. According to Friedman, the same variables that affect the demand for assets also affect the demand for money. Friedman then created the theory of asset demand and money as a result. In this instance, Friedman divides available assets into three categories: bonds, equity (common stock), and goods.

Nevertheless, what distinguishes Friedman from Keynes theory is the assumption that interest has little effect on the demand for money. Keynes proposed that interest is an important factor in money demand, while classical economists assume that interest is not the main factor. This is because when there is an increase in interest, the banks will be keen to attract deposits from the public and eventually raise deposit interest or reproduce more compelling services for the public, so that the expected profit rate of the currency will rise. Thus, it is expected to create a productive society through entrepreneurship in the down economy, and the aghniya can contribute to capitalization so that it can create jobs and be able to play a role in the welfare of society.

Meanwhile, the revenue sharing system with the zakat system and a ban on speculation in the Islamic economy will encourage the real sector to invest in the investment climate with the goal of being fully productive. This will ensure terdistribusinya wealth and income. Increased productivity and employment opportunities will drive economic growth and achieve prosperity.

ISSN 2302-9366 (Print) ISSN 2302-9781 (Online)

Because their motivations and guarded transactions are based on the income of money and its distribution, the need for money will emerge in an Islamic state economy. The Arab, Roman, and Persian dinars were imported at the start of the Islamic era as currency. The quantity of goods imported from the two nations and other areas that are influenced by them determines the size of the imports of dinars and dirhams as well as other commodities. Typically, goods will be imported if there is a fall in the demand for money, and money will be imported if there is a rise in the demand for money on the internal market. Chapra (2000) asserts that Islam's lack of enforcement of its economic interests and the existence of.

Chapra bases his theory of Islamic monetary money demand on the Keynesian model. The model's level of profit sharing is important instead of flowers. Chapra created a demand for money model that looks like this (Chapra, 1996).

$$Md = f(Ys, S, \pi), \text{ where:}$$

Ys = goods and services related to fulfillment, productive investment, and certainly not contrary to Islamic values.

S = the entire set of moral, social, and institutional norms (including zakat) that have an impact on how resources are allocated and distributed and can reduce Md for preventative and speculative objectives as well as for conspicuous consumption and wasteful spending.

π = rate gain or loss in a system which does not allow the use of interest rates as a financial intermediary.

In 1956, Milton Friedman developed a theory of money demand, which refers to the classical theory; however, in its analysis, Friedman is actually closer to Keynes. According to Friedman, the demand for money is influenced by the same factors that influence the demand for assets. Therefore, Friedman then developed the theory of asset demand and money. In this case, Friedman categorizes three types of assets that can be owned by individuals: bonds, equity (common stock), and goods.

Nevertheless, what distinguishes Friedman from Keynes theory is the assumption that interest has little effect on the demand for money. Keynes proposed that interest is an important factor in money demand, while classical economists assume that interest is not the main factor. This is because when there is an increase in interest, the banks will be keen to attract deposits from the public and eventually raise deposit interest or reproduce more compelling services for the public, so that the expected profit rate of the currency will rise.

Here, Umer Chapra looks to add a component of the S and makes r (rate) by as the application form of the prohibition of usury. However, in fact, Ys is restricted to not conflicting with Islamic values. Chapra defines social values as all the things that are not prohibited by religious and social nature (zakat, waqf, donation, and *sadaqah*) that affect the demand for money.

The equation produces three key elements, the first of which is income. Money's role as a medium of exchange and a store of value generates this element. The second factor, which results from the role of money as a store of value, is the rate of profit of assets other than money. The last aspect is zakat, which is significant since money serves as a store of wealth. Negative zakat, inflation, asset profit rate, and positively connected income were also present.

Money Demand in Financial Dual System

In 1956, Milton Friedman developed a theory of money demand, which refers to the classical theory; however, in its analysis, Friedman is actually closer to Keynes. According to

Friedman, the demand for money is influenced by the same factors that influence the demand for assets. Therefore, Friedman then developed the theory of asset demand and money. In this case, Friedman categorizes three types of assets that can be owned by individuals: bonds, equity (common stock), and goods.

Nevertheless, what distinguishes Friedman from Keynes theory is the assumption that interest has little effect on the demand for money. Keynes proposed that interest is an important factor in money demand, while classical economists assume that interest is not the main factor. This is because when there is an increase in interest, the banks will be keen to attract deposits from the public and eventually raise deposit interest or reproduce more compelling services for the public, so that the expected profit rate of the currency will rise.

In countries that implement the financial system or double banking (conventional and Islamic), the monetary authorities have a responsibility to maintain the stability of the monetary and financial systems as well as to synergize the two systems to optimize the benefits for the welfare of society (Ascarya & Achsani, 2008). In 1956, Milton Friedman developed a theory of money demand, which refers to the classical theory; however, in its analysis, Friedman is actually closer to Keynes. According to Friedman, the same variables that affect the demand for assets also affect the demand for money. Friedman then created the theory of asset demand and money as a result. In this instance, Friedman divides available assets into three categories: bonds, equity (common stock), and goods.

Nevertheless, what distinguishes Friedman from Keynes theory is the assumption that interest has little effect on the demand for money. Keynes proposed that interest is an important factor in money demand, while classical economists assume that interest is not the main factor. This is because when there is an increase in interest, the banks will be keen to attract deposits from the public and eventually raise deposit interest or reproduce more compelling services for the public, so that the expected profit rate of the currency will rise

Synergies between these two systems should maintain the essence and characteristics of each, without merging one system into the other, in order to achieve sustainable harmonization, which ensures the stability of the financial system, accelerates economic activity in the real sector, and increases the welfare of the population.

Broadly speaking, there are three pillars of the monetary system to distinguish from one another: the system of money, the banking system, and the operating system finances.

The three main pillars that distinguish the conventional monetary system from the monetary system of Islam are the reserve banking system and the system of interest and profit-sharing (Ascarya & Achsani, 2007). The monetary authority has a responsibility to maintain the stability of the monetary and financial systems, as well as to synergize the two systems to optimize the benefits for the welfare of society.

Model of demand for money in the financial system of the double one of them presented by Kaleem (Kaleem, 2000) follow the model developed by Ahmad and Khan (Khan, 1986) by eliminating the interest rate component of R, so the demand for conventional and Islamic money demand in multiple financial systems can be compared as follows (Ascarya & Achsani, 2008).

$$\ln MRT = \Phi 0 + \Phi 1\, Yt + \Phi 2\pi \ln t$$

$$\ln MISLRt = \alpha 0 + \alpha 1 \ln Yt + \alpha 2\pi t$$

Where MR is the balance of conventional and MISLR real money balances in Islam, However, the proposed model has received criticism from Hasanah et al (2008) and Ascarya & Achsani (2008), which states that by eliminating the element of interest rates, the main characteristic of the conventional financial system is lost, while the return of Sharia, which is characteristic of the Islamic financial system, also does not appear in the equation stretcher. Hasanah et al. (2008) and then propose an alternative model to re-enter the interest rate in

the conventional money demand equation and insert the return of Sharia in the Islamic money demand equation as a variable key differentiator between the two models, which are in line with the opinions of Ascarya (2007). The model equation of money in the financial system doubles.

$$\ln MRT = \Phi 0 + \Phi 1 \ln Yt + \Phi 2 Rt + \Phi 3\pi t$$
$$\ln MISLRt = \alpha 0 + \alpha 1 \ln Yt + \alpha 2 + \alpha 3\pi RST t$$

Where MR is the conventional real money balances, R is the interest rate, MISLR is real money balances Islam, RS is the return of Sharia, and π is inflation expectations.

Money Demand In Some Islamic Countries

Research thus only used a few instruments in Islamic economics as the basis of economic and monetary policy-making, which was commissioned by Kia (2007), which took the case studies in the State of Iran. As we know, the Iranian government followed the principles of Islamic law in the regulation of both the social and banking systems after the revolution in 1979. He described the money demand function in Iran and proved the stability of money demand models in a usury-free economy (Khan, 1986). Additionally, Ausaf (2000) also describes some of the regulations that have been run by the State of Pakistan with its Islamic banking system since 1979. In December 1984, all commercial banks in Sudan also operated in accordance with Islamic law.

In Islam, the Islamic money demand mechanism based on interest rates. Consequently, Islamic countries try to request a policy regulation of money with some instrument in their financial institutions (Fauzi & Hapsari, 2019). Regarding the study of various financial systems, Kaleem (2000) conducted research on the stability of the Malaysian dual banking system by calculating the demand for both conventional and Islamic currency. In contrast, he adds the variable return of Sharia to the Islamic money demand equation in his research while removing the variable interest rate from the conventional money demand equation. The findings demonstrate that the conventional money demand is identical to the Islamic money demand, which is not shock-resistant. His analysis also revealed a relationship between the price level and the conventional and Islamic M1 and M2 monetary aggregates. Data were used by Darrat (2000) to do study on the dual financial system in the countries of Iran and Pakistan. The purpose of this study to look at the stability of money demand among both interest and the results over the long term (Darrat, 2000). The results show that the interest free has a strong relationship with the instruments of policy and price stability in the country.

Furthermore, Izhar and Asutay (2007) also conducted research on monetary stability in the banking system in Indonesia, 2001-2004. The results show that both the long-term variables conventional M2 and M2 Islam do not have a significant relationship with the price level. But the value of the error correction term (ECT) in the conventional system is greater than the ECT in the Islamic system (Izhar & Asutay, 2007).

This study was followed by Hasanah et al (2008), and Ascarya & Achsani (2008) which examines the behavior of monetary aggregates in a dual financial system in Indonesia than in 2001-2006 by entering a return variable for the results in the Islamic money demand models to differentiate with conventional money demand models that have variable interest rates. The findings shown that the demand for all elements of Islamic money (currency, demand deposits Wadiah, *Mudharabah* savings, and deposits *Mudharabah*) is adversely impacted by returns of profit sharing (*Mudharabah*). In addition, the demand for Islamic currency responds to shocks from other variables more steadily than the demand for conventional currency. In the case of conventional money demand, interest rates affect how that demand behaves, whereas in the case of Islamic money demand, return *mudharabah* nearly completely determines how that demand behaves

Building A Muslim State Money Demand Model

Based on historical research, theory, and empirics above on the demand for money in Islam, the authors sought to build a model of money demand in Muslim countries where the majority use multiple financial systems. Earlier methods used by Muslim economists in studying the demand for money in Islamic economics are still used by many who use the basic theory of Keynes (Sadeghi, 2018).

Furthermore, Farzaneh added further categories of research on money demand models in Muslim countries that can be built using a microeconomic theory approach. As has been done by Moradi (2000) create derivative demand for money in a riba-free economy by cashing in advance using a model that is built on the assumption of countries that use the monetary system of Islamic banking.

The demand function, which is based on a micro-economic approach, does have drawbacks for its use as an approach to the demand for money in the economic system (Sadeghi, 2018). The approach taken by maximizing the utility function, which indicates the assumption of consumer behavior with an indication of income on the basis of the Islamic economy resulting from the demand function. The utility function is a function that describes the amount of utility (satisfaction, usability) obtained by a person from consuming a good or service. In general, the greater the number of goods consumed, the greater the utility gained. Once it reaches its peak (saturation point) on a certain amount of consumption, it may be reduced or even negative if the quantity of goods consumed is continuously added.

Total utility is a function of the quantity consumed. The total utility equality (total utility, U) from consuming a type of good is in the form of a parabolic quadratic function with an open parabolic curve downward. Marginal utility (MU) is an additional utility derived from each unit of goods consumed. Mathematically, the marginal utility function is the first derivative of the function of total utility. If the total utility function is expressed by U = f (Q) which symbolizes the total utility U and Q the quantity consumed, then the marginal utility:

$$MU = U' = \frac{dQ}{dU}$$

Conditional optimization is an optimization problem that has qualified or has limits that are the problem of mathematical modeling in the optimization function that require a number of conditions or requirements to obtain an optimal solution that optimizes the objective function requirements.

Maximize / Minimize f = f (X)
Constraints gj (X), j = 1, 2, 3, ..., m

with: X = (x1, x2, x3, ..., xn) T and m ≤ n. The method can be used to solve optimization problems is the Lagrange multiplier method. This method begins with the formation of the Lagrange function is defined as:

$$L(X,\lambda) = f(X) + \sum_{j=1}^{m} \lambda_j g_j(X)$$

Determining the necessary condition to obtain the extremes:

$$\frac{\partial L}{\partial x_1} = \cdots = \frac{\partial L}{\partial x_n} = \frac{\partial L}{\partial \lambda_1} = \cdots = \frac{\partial L}{\partial \lambda_m} = 0$$

Finding all solutions sufficient conditions for relative extreme. Evaluated at point X = X * are positive definite (or negative definite) for any variations in the value of dx is any root of the polynomial zi, which is obtained from the determinant equation:

$$Q = \sum_{i=1}^{n} \sum_{j=1}^{n} \frac{\partial^2 L}{\partial x_i \partial x_j} dx_i dx_j$$

The model is based on the demand for money and Goodfriend McCallum's Islamic approach to modeling shopping time. This function contains two parts, where the left side depicts a person's income sources at the beginning of the period and the right side depicts the individual consumption expenditure in the period. Generally, the function is described in the form of:

$$Yt = c_t + g_t + k_t + (1 + R_t) + m_t$$

This function emphasizes the three kinds of spending a Muslim does, namely: c shows consumption expenditure spent on goods and services; g is social spending used for charity; and h is spending in the way of Allah. As for saving and investment spending, as indicated by the notation k, The basic model of household savings can be used as an alternative sukuk in Islamic economics. The return on the return of sharia d is described by r, and cash used for consumption is represented by m.

It can be concluded from the production function that total consumer income derivatives, represented by Y, show that there is a relationship between spending and money. Assuming the number of people, we can reduce the money demand function as a consumer society. In this case, total consumption is equal to total income. Thus, the marginal product of capital based on the increase revenue used for charity and depreciation tingat return sukuk.

With a microeconomic approach, the money demand function can be built in Muslim countries, namely:

$$Md = f(Y, r_{,,} s)$$

Md = Demand for money in an Islamic state (Money Kartal and Giro Wadiah)
Y = Income can be seen from the GDP
R = Gains from financial assets other than cash and free of elements of interest. Can be seen from the return or the return level *mudaraba* sukuk yield
S = Zakat and social spending, such as *infaq, waqf* and *sadaqah*

From the above functions, it can be explained that a Muslim is fitting in the management of his property and money based on the values of Islam, These are represented by the relationship between Y, R, and S. A Muslim must make selective and productive use of their income (Y). Likewise, r, which is an advantage for the results of asset avoidance, And S, Zakat, and social or *ihsanul* spending will be the size of the productive circulation of the money. This aligns with the functions used to describe the model in Chapra's work.

Table 1. Variable Money Demand in Muslim countries Year 2009-2018

Year	M2 (Milyar Rp)	Return on Investment (Billions of Rupiah)	GDP (Billion Rp)	ZIS Collection (Billion Rp)
2009	1.883.851,00	12.00%	4.187.121,33	1.200,00
2010	2.141.384,00	8.70%	6.864.133,10	150.000,00
2011	2.471.205,79	8.15%	7.287.635,30	1.729,00
2012	2.877.219,57	6.25%	7.727.083,40	2.212,00
2013	3.307.507,55	6.00%	8.156.497,80	2.639,00
2014	3.730.197,02	8.75%	8.564.866,60	3.300,00
2015	4.173.326,50	8.25%	8.982.517,10	3.650,00
2016	4.546.743,03	8.30%	9.434.613,40	5.017,00
2017	5.004.976,79	6.90%	9.912.703,60	6.224,00
2018	5.419.165,05	5.90%	10.425.316,30	8.117,00

Source: BI Center for Data and Information System for the Ministry of Commerce

In the financial system of the Islamic State, the derivative function in the community is indicated by the demand for money in view of the currency. Y is determined from the level of GDP that describes people's income, return savings mudaraba or yield bonds, inflation expectations, and the amount of public expenditure for charity and social services in terms of the number ZISWAF, which is managed by a state agency.

A study of the demand for money in Muslim countries is done in Indonesia using sample data from 2009–2018. The variables used are M2, Sukuk, GDP, and ZIS in the State of Indonesia. These data can be seen in the following table 1.

An Empirical Analysis of Money Demand in Muslim Countries: Insights from Multiple Regression"

The image distribution of the data request for money in Muslim countries of Indonesia with variables M2, Sukuk, GDP, and ZIS shows a linear trend and the normal distribution; thus, to complete the money demand function in Muslim countries with a focus on Indonesia, it can be solved by multiple regression using SPSS. The results of calculations using SPSS are as follows:

Table 2. Descriptive Statistics

	Mean	Std. deviation	N
M2	15.0268	.36410	10
sukuk	.0792	.01821	10
GDP	15.8869	.26111	10
ZIS	8.0001	.62963	10

Table 2 presents the descriptive statistics for the variables analyzed in this study, namely M2 (money demand), Sukuk, GDP (Gross Domestic Product), and ZIS (Zakat, Infaq, and Sadaqah). The average value of money demand (M2) is 15.0268 with a standard deviation of 0.36410, indicating that the money demand in the sample of Muslim countries shows relatively small variation around the mean value. The Sukuk variable has an average value of 0.0792 and a standard deviation of 0.01821, suggesting a relatively small contribution to the total money demand and low variation among the observed samples. GDP has an average value of 15.8869 with a standard deviation of 0.26111, indicating that GDP tends to be consistent throughout the sample period. Meanwhile, ZIS has an average value of 8.0001 with a standard deviation of 0.62963, implying that despite a slight variation in ZIS, its values remain relatively consistent across the sample.

Overall, these data demonstrate that the variables used in the regression analysis exhibit relatively small variations, reflecting the consistency of the data within the sample. Sukuk has a smaller contribution to money demand compared to GDP and ZIS. The stability of these values may indicate stable economic conditions and policies in Muslim countries that influence money demand. This information is crucial for further understanding the relationships between these variables in the regression analysis, where the coefficients and significance of each variable will provide insights into the factors influencing money demand in Muslim countries.

This study aims to evaluate the factors influencing money demand (M2) in Muslim countries, with a specific focus on the roles of Sukuk (Islamic bonds), GDP (Gross Domestic Product), and ZIS (*Zakat, Infaq,* and *Sadaqah*). Utilizing multiple linear regression analysis, the study investigates how these variables affect money demand and whether they provide significant insights into economic behavior within the context of Muslim countries.

Hypotheses

The hypotheses tested in this study are as follows:

 ISSN 2302-9366 (Print) ISSN 2302-9781 (Online)

H_1: Sukuk (Islamic bonds) positively influences money demand (M2) in Muslim countries.
This hypothesis suggests that an increase in Sukuk issuance will lead to an increase in money demand, as these financial instruments are considered secure and Sharia-compliant investment options.
H_2: GDP positively influences money demand (M2) in Muslim countries.
This hypothesis posits that higher GDP, indicating a stronger economy, will correlate with higher money demand due to increased economic activity and income levels.
H_3: ZIS (Zakat, Infaq, and Sadaqah) positively influences money demand (M2) in Muslim countries.

This hypothesis suggests that higher levels of ZIS contributions, reflecting the religious and social obligations of wealth distribution in Islam, will lead to increased money demand by stimulating economic transactions and financial inclusion.

Table 3 presents the results of the multiple linear regression analysis conducted to determine the influence of Sukuk (Islamic bonds), GDP, and ZIS (Zakat, Infaq, and Sadaqah) on money demand (M2) in Muslim countries.

Table 3. Multiple Linear Regression Test Results

Variable	Coefficient	t-Statistic	Prob.
C	5711	1,820	.119
Sukuk	1,367	.726	.495
GDP	.343	1,573	.167
ZIS	.469	6769	.001

Source: SPSS Output (processed data by the author)
The regression equation derived from this analysis is as follows:
Money Demand= 5711 + 1.367 Bonds + 0.343 GDP + 0.469 ZIS

The constant term has a coefficient of 5711, indicating that, holding all other variables constant, the baseline level of money demand is 5711. The coefficient for Sukuk is 1.367, with a t-statistic of 0.726 and a probability value of 0.495. This suggests that a one-unit increase in Sukuk would result in an increase of 1.367 units in money demand. However, this effect is not statistically significant, as indicated by the probability value being greater than the significance level.

The GDP coefficient is 0.343, with a t-statistic of 1.573 and a probability value of 0.167. This indicates that a one-unit increase in GDP would lead to a 0.343 unit increase in money demand. Similarly, the effect of GDP on money demand is not statistically significant, as the probability value is higher than the significance level.

The coefficient for ZIS is 0.469, with a t-statistic of 6.769 and a probability value of 0.001. This indicates that a one-unit increase in ZIS results in a 0.469 unit increase in money demand. The probability value is below 0.05, demonstrating that ZIS has a statistically significant positive effect on money demand in Muslim countries.

ZIS (*Zakat, Infak,* and *Sedekah*) has a significant impact on M2 in Muslim countries due to its role in wealth redistribution, economic stabilization, promotion of productive activities, multiplier effect, increased trust and participation in the Sharia financial system, and reduction of the fiscal burden on the government. ZIS plays a crucial role in distributing income and wealth within society. By channeling funds from wealthier individuals or groups to those in need, ZIS helps reduce economic inequality (Saiti et al., 2021). This process not only enhances the welfare of recipients but also boosts their purchasing power and, consequently, the overall demand for money (M2) in the economy (Ben Jedidia & Guerbouj, 2021) .

The regression model indicates that ZIS is the only variable with a significant positive impact on money demand in Muslim countries, as evidenced by the probability value being well below the 0.05 significance level. In contrast, Sukuk and GDP do not exhibit statistically significant effects on money demand within the sample. These findings underscore the importance of ZIS in influencing money demand, while the roles of Sukuk and GDP are less clear based on this analysis. This model provides valuable insights into the factors affecting money demand in the context of Muslim countries, with practical implications for economic policy and financial planning.

Table 4 presents the results of the F-test and the coefficient of determination (R-squared) for the regression model used to analyze the factors influencing money demand (M2) in Muslim countries.

Table 4. F Test Results and Coefficient of Determination

R-squared	.982
Adjusted R-squared	.973
F-statistic	107.139
Prob(F-statistic)	.000b

Source: SPSS Output (processed data by the author)

The R-squared value of 0.982 indicates that approximately 98.2% of the variability in money demand (M2) can be explained by the independent variables included in the model (Sukuk, GDP, and ZIS). This high R-squared value suggests that the model has a strong explanatory power.

The Adjusted R-squared value of 0.973 is slightly lower than the R-squared value. Adjusted R-squared accounts for the number of predictors in the model relative to the number of data points, providing a more accurate measure of the goodness-of-fit for models with multiple independent variables. An Adjusted R-squared value of 0.973 still indicates that 97.3% of the variability in money demand is explained by the model, affirming the model's robustness and reliability.

The F-statistic is used to test the overall significance of the regression model. An F-statistic of 107.139 indicates that the model is statistically significant. The corresponding probability value (Prob(F-statistic)) of 0.000 is well below the typical significance level of 0.05, suggesting that the independent variables (Sukuk, GDP, and ZIS) collectively have a significant impact on money demand (M2).

The results from Table 4 show that the regression model has a high explanatory power, as indicated by the R-squared and Adjusted R-squared values. The model explains approximately 98.2% of the variability in money demand, and the Adjusted R-squared value confirms the model's robustness. Additionally, the F-statistic and its associated probability value indicate that the model is statistically significant, meaning that Sukuk, GDP, and ZIS collectively have a significant influence on money demand in Muslim countries. These findings provide strong evidence for the effectiveness of the model in explaining the factors that drive money demand in the studied context.

CONCLUSION

The Islamic financial system in Muslim countries today, operating under the fiat money system, faces significant challenges as part of the broader, often unstable conventional financial system. Therefore, innovations developed within the Islamic financial system must remain firmly rooted in Sharia principles. Unlike the conventional system, Islam fundamentally rejects interest. Speculation in the conventional economic system has greatly contributed to

financial crises, which can be mitigated by applying the concept of profit-sharing in financial institutions. This approach can stabilize the economy by minimizing inflation and maximizing the demand for money for productive activities through optimized zakat institutions. Zakat and other forms of social spending play a crucial role in the demand for money, serving three primary economic functions: redistributing income and wealth, stabilizing the economy, and acting as instruments for development and the empowerment of the poor. These mechanisms ensure that the Islamic financial system not only adheres to religious principles but also contributes to broader economic stability and social welfare.

The urgency of this research lies in its potential to make a significant contribution to the development of the Islamic financial system in the future. The proposed solutions offer a roadmap for creating a more stable and equitable economy, minimizing the adverse effects of speculation and inflation. By addressing the dynamics within the Islamic financial system, this conclusion emphasizes the importance of maintaining innovation grounded in Sharia principles. Through the concepts of profit-sharing and optimizing zakat, it is hoped that sustainable economic stability can be achieved, reducing the impact of inflation and opening the door to equitable prosperity. Thus, the role of zakat as a tool for redistribution, economic stabilization, and development is crucial in realizing the vision of a sustainable and inclusive Islamic economy. Facing the current dynamics in the Islamic financial system, this study underscores the critical need for innovations rooted in Sharia principles. Through the application of profit-sharing concepts and the optimization of zakat, sustainable economic stability can be achieved, mitigating inflation and promoting equitable prosperity. Thus, the role of zakat as a redistribution tool, economic stabilizer, and development instrument is pivotal in realizing the vision of a sustainable and inclusive Islamic economy.

REFERENCES

Abilawa, M. S., & Siddiq, R. (2016). Determinan Permintaan Uang Di Indonesia. *Jurnal Ekonomi-Qu*, *6*(1). https://jurnal.untirta.ac.id/index.php/Ekonomi-Qu/article/view/4189/3014

Ahmad, H., Sadeeque, J., Farooq, U., Hayat, U., & Haroon, U. (2024). Fiscal policy determinants impact on the economic growth with the moderating role of the exchange rate and Inflation rate: Evidence from an emerging economy. *Journal of Excellence in Management Sciences*, *3*(3).

Amri, K. (2018). Analisis Kebijakan Moneter Pada Awal Pemerintahan Islam Terhadap Pembangunan Perekonomian Islam. *Jurnal Islamic Banking*, *3*(2).

Ascarya, H. H., & Achsani, N. A. (2007). Perilaku Permintaan Uang Dalam Sistem Moneter Ganda Di Indonesia. *Buletin Ekonomi Moneter Dan Perbankan*.

Ascarya, H. H., & Achsani, N. A. (2008). Perilaku Permintaan Uang Dalam Sistem Moneter Ganda Di Indonesia. *Buletin Ekonomi Moneter Dan Perbankan*.

Ben Jedidia, K., & Guerbouj, K. (2021). Effects of zakat on the economic growth in selected Islamic countries: empirical evidence. *International Journal of Development Issues*, *20*(1), 126–142. https://doi.org/10.1108/IJDI-05-2020-0100

Bhar, R., & Malliaris, A. G. (2021). Modeling U.S. monetary policy during the global financial crisis and lessons for Covid-19. *Journal of Policy Modeling*, *43*(1), 15–33. https://doi.org/10.1016/j.jpolmod.2020.07.001

Branson, W. H. (1989). *Macroeconomic: Theory and Policy* (3rd ed.). Harper & Rower.

Chapra, M. U. (1996). Monetary Management in an Islamic Economy. *Islamic Economic Studies*, *4*(1).

Darrat, A. F. (1984). The Money Demand Relationship in Saudi Arabia: An Empirical Investigation. *Journal of Economic Studies*, *11*(3), 43–50. https://doi.org/10.1108/eb002582

Darrat, A. F. (2000). On The Efficiency Of Interest-Free Monetary System: A Case Study. *Erf's Seventh Annual Conference*.

Edwards, S., & Montes, L. (2020). Milton Friedman In Chile: Shock Therapy, Economic Freedom, And Exchange Rates. *Journal of the History of Economic Thought*, *42*(1), 105–132. https://doi.org/10.1017/S1053837219000397

Fauzi, R. M. Q., & Hapsari, M. I. (2019). Islamic Monetary Management: A Critical Overview. *The 2nd .2019*.

Galbács, P. (2015). *Monetary Policy in the New Classical Framework* (pp. 149–219). https://doi.org/10.1007/978-3-319-17578-2_4

Hossain, A. A. (2016). Inflationary shocks and real output growth in nine Muslim-majority countries: Implications for Islamic banking and finance. *Journal of Asian Economics*, *45*, 56–73. https://doi.org/10.1016/j.asieco.2016.06.004

Hossain, B. (2020). Islamization of Monetary Policy of 27 OIC Muslim Countries in Asia: The Successes, The Barriers and The Future Directions. *Global Review of Islamic Economics and Business*, *7*(2), 091. https://doi.org/10.14421/grieb.2019.072-04

Huda Et-Al Nurul, D. (2009). *Ekonomi Makro Islam Pendekatan Teoritis*. Kencana Prenada Media Group.

Ireland, P. N. (2022). The Recent Surge in Money Growth: What Would Milton Friedman Say? *Journal of Applied Corporate Finance*, *34*(2), 65–81. https://doi.org/10.1111/jacf.12507

Izhar, H., & Asutay, M. (2007). The Controllability And Reliability Of Monetary Policy In Dual Banking System: Evidence From Indonesia. *International Islamic University Malaysia (Iium) International Conference On Islamic Banking And Finance (Iicibf)*.

Kaleem, A. (2000). Modeling Monetary Stability Under Dual Banking System: The Case Of Malaysia. *International Journal Of Islamic Financial Services*, *2*(1).

Karim, A. A. (2001a). *Ekonomi Islam: Suatu Kajian Kontemporer*. Gema Insani Press.

Karim, A. A. (2001b). *Sejarah Pemikiran Ekonnomi Islam*. Iiit.

Khan, M. (1986). Islamic Interest Free Banking. *Imf Staff Papers*, *33*(1).

Khan, M. F., & Jabeen, Z. (2020). *Islamic Monetary Economics* (1st ed.). Routledge.

Mankiw, N. G. (2006). *Macroeconomics* (6th ed.). Worth Publishers.

Mishkin, F. S. (2004). *The Economics of Money, Banking, and Financial Markets* (7th ed.). Pearson Addison Wesley.

Moradi, M. (2000). Money Demand Based On Microeconomics In No Interest Economy. *Journal Of Budget And Management*, *58*.

Muhammad. (2007). *Prinsip-Prinsip Ekonomi Islam*. Graha Ilmu.

Nelson, E. (2020). Seven Fallacies Concerning Milton Friedman's "The Role of Monetary Policy." *Journal of Money, Credit and Banking*, *52*(1), 145–164. https://doi.org/10.1111/jmcb.12591

Rivot, S. (2017). Economic policy as expectations management: Keynes' and Friedman's complementary approaches. *The European Journal of the History of Economic Thought*, *24*(5), 1053–1084. https://doi.org/10.1080/09672567.2017.1323939

Sadeghi, F. (2018). *The Money Demand Functions In Islamic Economy: New Evidence From Iran-Ardl Approach* (Vol. 4, Issue 2). Journal Of Islamic Monetary Economics And Finance.

Saiti, B., Dembele, A., & Bulut, M. (2021). The global cash *waqf* : a tool against poverty in Muslim countries. *Qualitative Research in Financial Markets*, *13*(3), 277–294. https://doi.org/10.1108/QRFM-05-2020-0085

Siregar, M. (2000). Perlunya Managemen Moneter Yang Dapat Memperkecil Kegiatan Spekulasi. *Analitica Islamica*, *2*.

Wahyudi, A. (2013). Kebijakan Moneter Berbasis Prinsip-Prinsip Islam. *Justitia Islamica*, *10*(1).

Zauro, N. A., Zauro, N. A., Saad, R. A. J., & Sawandi, N. (2020). Enhancing socio-economic justice and financial inclusion in Nigeria. *Journal of Islamic Accounting and Business Research*, *11*(3), 555–572. https://doi.org/10.1108/JIABR-11-2016-0134.

ABOUT THE AUTHOR

Yuda Septia Fitri, I'm a Doctor in Islamic Law (specializing in Islamic Economics). I'm Lecturer at UIN Sunan Gunung Djati Bandung, Department of Management. My research focus is in the fields of finance, management, economics, and Islamic business.

Vemy Suci Asih, I'm a Magister in Islamic Economics, and pursuing a Doctoral Program in Islamic Law (specializing in Islamic Economics). I'm Lecturer at UIN Sunan Gunung Djati Bandung, Department of Islamic Financial Management. My research focus is in the fields of finance, management, economics, and Islamic business.

Dudang Gojali, I'm a Professor in Islamic Law (specializing in Islamic Economic Law). I'm Lecturer at UIN Sunan Gunung Djati Bandung, Department of Islamic Accounting. My research focus is in the fields of Islamic economic law, economics, and Islamic business.