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Research Article

THE IMPACT OF FUTURE MARKET ON MONEY DEMAND IN IRAN

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ABSTRACT
The purpose of this study is modeling for money demand function in Iran, because the traditional Modeling was considered the money demand function only as a function of income and opportunity cost of currency holding. But, today according to innovations and financial initiatives and also economic uncertainty, the monetary changes cannot be explained through the simple relationship told by varies schools. Since, economic instabilities can do an important role in currency holding by economic agents and considering the impacts of such uncertainties, they create their own portfolio. But the importance of issue is that the money demand and its determinants play determining role in macroeconomic analysis and monetary policy making by the monetary authorities of a country. Generally, examining the amount of money demand in a country economic situation can be analyzed. So, in the present research using the mathematical techniques money demand function has been extract for Iran's economy.

Keywords: *Money Demand, Portfolio, Iran's Economy, Future Market, Exchange*

INTRODUCTION
Money demand has been studied by varies economists in the economic literature and there are several Approaches in this field that we can point out some theories of money demand such as Fisher, Keynes, Baumol-Tobin and Freedman. Accordingly for the first time, the famous formula of quantity theory of Money introduced by Fisher (1911) and it shows the direct and proportional relationship between money and price level. Another interpretation of quantity theory of money is known as Cambridge approach. This model links the amount of money demand to nominal income. But Keynes (1936) looked to money demand from a different angle and presents more accurate analysis than previous economists. He stated his theory, assuming that people maintain money due to the existence of transactions motivations, precautionary and Speculative. Accordingly, the demand for real money stock has direct relationship with real income and reverse relationship with interest rate. Two features of money including be an exchanging device and value storage are infrastructure of theories after Keynes. Baumol (1952) and Tobin (1956) were assumed that money maintains as inventory for transactions necessarily and they used this assumption to develop their own models. Also Friedman (1956) argues that demand for assets should be takes shape based on normal rule of consumer choice. He began with a theory of aggregate demand as infrastructure and he assume that money give flow of services (convenience in exchange and being without risk) like other assets. Then he used the amount of wealth (human and non-human) as a budget restriction. Friedman suggested that a wide range of opportunity cost variables such as expected inflation rate (as a substitute variable for the return of real goods) influence on money demand. Also, he proposed the wealth as a determinant of demand money. However what most can be seen in these theories is regarding interest rates has income. But the importance of issue is that money demand and affecting factors on it the play a decisive role in the macroeconomic analysis and monetary policy making by monetary authorities. Today, examining the money demand in a country, economic situation can be analyzed. Since, instead the interest rates in Iran are determined by market mechanisms, it is determined as administrative and command. In other words, the impact of supply and demand rule performance in money market does not reflect in interest rate. So, the interest rate is not appropriate criteria to show opportunity cost of money maintenance. Since the lack of developed financial market maintenance of real

assets is profitable than maintenance of financial assets and it leads to lack of diversification in economic factor's portfolio. Accordingly economic factors pay Speculation in the land markets, housing, exchange and coin. This is caused to excess demand over supply in these markets. In the present research main focus is on exchange market, since increases in exchange price cause to difficulties in deciding of exporters, importers and investors (because of the extreme uncertainty of value of Iran's rial). The exchange futures market has been considered by many experts to prevent of this inflammation. Money substitution phenomenon1 will occur with formation of exchange futures market and entering assets to this market and price of this market enters as a new variable of individuals money demand function.

Girton and Roper (1981), in their study considered demand as a function of the actual rate of return of both money, real rate of return of non-monetary assets and welfare scale variable for both domestic and foreign money. They have used two money demand function with exogenous money supply for analysis of exchange rates in their article and other non-monetary assets was entered as implicit in this model. Instead of applying direct method of measuring currency substitution rate, Miles (1978) has suggested another method for currency substitution test. Miles method has been based on this assumption that real remaining parts of local and foreign currencies are data for production function and the output is the flow of monetary service. He assumed that production function is CES, homogeneous of degree one and foreign exchange market is determined by foreign exchange transactions with perfect interest. Miles maximizes the flow of monetary service with regard to asset constraint and supposes the currency substitution rate is just a function of the logarithm of the ratio of foreign interest rate to domestic interest rate. Tanzi and Blejer (1982) in their paper assumed that money demand In addition to scale variables such as wealth and income depends on rate of return of monetary savings to return of other assets. And it is expected that relatively higher rate of return on other assets such as foreign money, reduce demand for domestic money. So, probably the foreign money of business parties is an important component in domestic portfolio. Cuddington (1983), in his paper have separated demand of domestic inhabitants for foreign money from their demand on foreign non-monetary assets. Investors are select among the four types of assets: domestic money, foreign money, domestic bonds, and foreign bonds. Therefore, it is expect that the demand for domestic and foreign money increases with increasing in internal income and if accompanied by an increase in income trading variable increase the demand of foreign deposits, currency substitution has taken place, he said. Thomas (1985) in a paper with the title of "Asset theory and currency substitution" presume that in money demand side, economic activists have enough motivation to hold both foreign and local currencies and therefore foreign interest rate, foreign inflation rate, expected changes of foreign exchange rate are influential in demand for money. He concluded that these currencies can just be replaced with each other when cross elasticity between demands for local (foreign) currency to foreign (domestic) interest rate is negative.

MATERIALS AND METHODS

In 1936 for the first time, Keynes in his book "General theory, employment, interest and money" stated: if currency in circulation loses its liquidity feature, a large number of substitutes will come into existence for it, such as short-term debts, foreign currency, jewelers, precious metals and bank credit flows called credit money (Keynes, 1936). In this state the domestic currency will weak or in other words, the exchange rate will increase and much likely the demand for domestic currency will increase too. Of course, the exchange rate may reduce demand for domestic currency because people prefer to substitute foreign currency to domestic currency, it means that Greshman's law (1858) will reverse and good money brings out bad money from the market (Sebastian and Nadiri, 1981).

Based on this, we regard the money demand as a function of set of variables representing the opportunity cost of money holding. In this framework, if the foreign currency substitutes to domestic currency, the rate of return of foreign currency will be affecting factors on domestic money demand. Assuming that any interest not paid to balance of foreign currency, expected rate of return of foreign currency is equal to expected rate of increase in exchange rate (which is defined as the price of foreign currency). Thus the

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currency substitution will occur according to that the expected change in exchange rates had a significant effect on domestic money demand. Therefore, in this case based on existing rules in the theory of rational expectation2 economic agents enter the exchange rate in their portfolio. Also, according to the efficient markets hypothesis, futures rate is a good measure of the expected rate of exchange and it is risk free. A simple aspect of this hypothesis is that for individuals there are no exchanges cost, and given the all available information, the futures rates provide optimal prediction for future spot rates. This hypothesis support with substantial evidence for numerous countries and it shows that futures rates will provide an unbiased forecast of future spot rates. Based on The Simple Efficiency Hypothesis: forecast error resulting from available information about the future cash rates, handles all tests as well, and if this hypothesis not established then futures rates measures the expected cash rate with some systematic error (probably due to the risk factors and transaction costs). If the error be small, futures rate can still be used as a good representative (Bordo and Choudri, 1982). So to extract the demand function of money, economic agents have utility U(Zt)and following restrictions:

$$U(Z_t) = E\left\{\sum_{t=0}^{\infty} U(c_t(k_t^{\$}, k_t^{\zeta+\vartheta}, m_t^{\xi}), m_t^{\psi})\right\}$$

$$m_t^{\psi} + c_t + k_t^{\$} + k_t^{\zeta+\vartheta} + m_t^{\xi} = \frac{m_{t-1}^{\psi}}{1+\dot{P}_t} + \frac{(1+r_t^{\$})k_{t-1}^{\$}}{1+\dot{P}_t} + \frac{(1+r_t^{\zeta+\vartheta})k_{t-1}^{\zeta+\vartheta}}{1+\dot{P}_t} + \frac{(1+r_t^{\xi})m_{t-1}^{\xi}}{1+\dot{P}_t} + y_t$$

Where c_:Real consumption of consumable goods, k_ :Real amount of foreign exchange assets, k_ 1_2 :Real amount of a portfolio of assets that can be stocked and land and house, m_ 4 :Real amount of long-term deposits, m_ 5 :Real amount of cash kept by people, P_ % :Inflation rate, r_ $: Return rate of foreign exchange assets, r_ 1_2 :Return rate of a portfolio of assets that can be stocked and land and house, r_ 4 :Return rate of bank deposits, ,:Real income, Z_:A vector of state variables, E_:Conditional expectation operator to full information at time t, 9:Discounting coefficient (a coefficient by which the present value of utility gained from good consumption and money saving during the time can be calculated) Lagrange function has been used so as to maximize utility function considering its constraint. Regarding 1st order condition, following results have been attained:

$$L(Z_t) = U\left(C_0\left(k_0^{\$}, k_0^{\zeta+\vartheta}, m_0^{\xi}\right), m_0^{\psi}\right) + \lambda_0\left[y_0 + \frac{m_{-1}^{\psi}}{1+\dot{P}_0} + \frac{(1+r_0^{\$})k_{-1}^{\$}}{1+\dot{P}_0} + \frac{(1+r_0^{\zeta+\vartheta})k_{-1}^{\zeta+\vartheta}}{1+\dot{P}_0} + \frac{(1+r_0^{\xi})m_{-1}^{\xi}}{1+\dot{P}_0}\right] +$$
$$E\left\{\beta U\left(C_1\left(k_1^{\$}, k_1^{\zeta+\vartheta}, m_1^{\xi}\right), m_1^{\psi}\right) + \lambda_1\left[y_1 + \frac{m_0^{\psi}}{1+\dot{P}_1} + \frac{(1+r_1^{\$})k_0^{\$}}{1+\dot{P}_1} + \frac{(1+r_1^{\zeta+\vartheta})k_0^{\zeta+\vartheta}}{1+\dot{P}_1} + \frac{(1+r_1^{\xi})m_0^{\xi}}{1+\dot{P}_1}\right]\right\} + \cdots +$$
$$E\left\{\beta^t U\left(C_t\left(k_t^{\$}, k_t^{\zeta+\vartheta}, m_t^{\xi}\right), m_t^{\psi}\right) + \lambda_t\left[y_t + \frac{m_{t-1}^{\psi}}{1+\dot{P}_t} + \frac{(1+r_0^{\$})k_{t-1}^{\$}}{1+\dot{P}_t} + \frac{(1+r_0^{\zeta+\vartheta})k_{t-1}^{\zeta+\vartheta}}{1+\dot{P}_t} + \frac{(1+r_0^{\xi})m_{t-1}^{\xi}}{1+\dot{P}_t}\right] - m_t^{\psi} - c_t -\right.$$
$$\left. k_t^{\$} - k_t^{\zeta+\vartheta} - m_t^{\xi}\right\} + \cdots$$

F.O.C

$$\frac{\partial L}{\partial k_0^{\$}} = \frac{\partial U}{\partial c_0} \times \frac{\partial c_0}{\partial k_0^{\$}} + E\lambda_1\left(\frac{1+r_1^{\$}}{1+\dot{P}_1}\right) - \lambda_0 = 0$$
$$\frac{\partial L}{\partial k_0^{\zeta+\vartheta}} = \frac{\partial U}{\partial c_0} \times \frac{\partial c_0}{\partial k_0^{\zeta+\vartheta}} + E\lambda_1\left(\frac{1+r_1^{\zeta+\vartheta}}{1+\dot{P}_1}\right) - \lambda_0 = 0$$
$$\frac{\partial L}{\partial m_0^{\xi}} = \frac{\partial U}{\partial c_0} \times \frac{\partial c_0}{\partial m_0^{\xi}} + E\lambda_1\left(\frac{1+r_1^{\xi}}{1+\dot{P}_1}\right) - \lambda_0 = 0$$
$$\frac{\partial L}{\partial m_0^{\psi}} = \frac{\partial U}{\partial m_0^{\psi}} + E\lambda_1\left(\frac{1}{1+\dot{P}_1}\right) - \lambda_0 = 0$$
$$\frac{\partial L}{\partial c_0} = \frac{\partial U}{\partial c_0} - \lambda_0 = 0$$

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$$\frac{\partial L}{\partial k_1^{\$}} = E\beta uc_1 \times \frac{\partial c_1}{\partial k_1^{\$}} + E\lambda_2 (\frac{1+r_2{}^{\$}}{1+\dot{P}_2}) - E\lambda_1 = 0$$

$$\frac{\partial L}{\partial k_1^{\zeta+\vartheta}} = E\beta uc_1 \times \frac{\partial c_1}{\partial k_1^{\zeta+\vartheta}} + E\lambda_2 (\frac{1+r_2{}^{\zeta+\vartheta}}{1+\dot{P}_2}) - E\lambda_1 = 0$$

$$\frac{\partial L}{\partial m_1^{\xi}} = E\beta^t uc_1^{\xi} \times \frac{\partial c_1}{\partial m_1^{\xi}} + E\lambda_2 (\frac{1+r_2^{\xi}}{1+\dot{P}_2}) - E\lambda_1 = 0$$

$$\frac{\partial L}{\partial m_1^{\psi}} = E\beta um_1 + E\lambda_2 (\frac{1}{1+\dot{P}_2}) - E\lambda_1 = 0$$

$$\frac{\partial L}{\partial c_1} = E\beta uc_1 - E\lambda_1 = 0$$

$$\frac{\partial L}{\partial k_t^{\$}} = E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\$}} + E\lambda_{t+1} \left(\frac{1+r_{t+1}{}^{\$}}{1+\dot{P}_{t+1}}\right) - E\lambda_t = 0 \Longrightarrow E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\$}} + E\lambda_{t+1} \left(\frac{1+r_{t+1}{}^{\$}}{1+\dot{P}_{t+1}}\right) = \lambda_t$$

$$\frac{\partial L}{\partial k_t^{\zeta+\vartheta}} = E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\zeta+\vartheta}} + E\lambda_{t+1} \left(\frac{1+r_{t+1}{}^{\zeta+\vartheta}}{1+\dot{P}_{t+1}}\right) - E\lambda_t = 0 \Longrightarrow E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\zeta+\vartheta}} + E\lambda_{t+1} \left(\frac{1+r_{t+1}{}^{\zeta+\vartheta}}{1+\dot{P}_{t+1}}\right) = \lambda_t$$

$$\frac{\partial L}{\partial m_t^{\xi}} = E\beta^t uc_t^{\xi} \times \frac{\partial c_t}{\partial m_t^{\xi}} + E\lambda_{t+1} \left(\frac{1+r_{t+1}^{\xi}}{1+\dot{P}_{t+1}}\right) - E\lambda_t = 0 \Longrightarrow E\beta^t uc_t \times \frac{\partial c_t}{\partial m_t^{\xi}} + E\lambda_{t+1} \left(\frac{1+r_{t+1}^{\xi}}{1+\dot{P}_{t+1}}\right) = \lambda_t$$

$$\frac{\partial L}{\partial m_t^{\psi}} = E\beta^t um_t^{\psi} + E\lambda_{t+1} \left(\frac{1}{1+\dot{P}_{t+1}}\right) - E\lambda_t = 0 \Longrightarrow um_t^{\psi} + E\lambda_{t+1} \left(\frac{1}{1+\dot{P}_{t+1}}\right) - \lambda_t = 0 \xRightarrow{uc_t=\lambda_t} um_t^{\psi} + E\lambda_{t+1} \left(\frac{1}{1+\dot{P}_{t+1}}\right) = uc_t \Longrightarrow um_t^{\psi} = uc_t - E\lambda_{t+1} \left(\frac{1}{1+\dot{P}_{t+1}}\right)$$

$$\frac{\partial L}{\partial c_t} = E\beta^t uc_t - E\lambda_t = 0 \Longrightarrow uc_t = \lambda_t$$

So we have:

$$E\beta^t uc_t \times \frac{\partial c_t}{\partial m_t^{\xi}} + E\lambda_{t+1} \left(\frac{1+r_{t+1}^{\xi}}{1+\dot{P}_{t+1}}\right) = \lambda_t = E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\zeta+\vartheta}} + E\lambda_{t+1} \left(\frac{1+r_{t+1}{}^{\zeta+\vartheta}}{1+\dot{P}_{t+1}}\right)$$

$$E\beta^t uc_t \times \frac{\partial c_t}{\partial m_t^{\xi}} + E \left(\frac{\lambda_{t+1}}{1+\dot{P}_{t+1}}\right) E(1 + r_{t+1}^{\xi}) = E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\zeta+\vartheta}} + E \left(\frac{\lambda_{t+1}}{1+\dot{P}_{t+1}}\right) E(1 + r_{t+1}^{\zeta+\vartheta})$$

$$E \left(\frac{\lambda_{t+1}}{1+\dot{P}_{t+1}}\right) = \frac{E\beta^t uc_t \times \frac{\partial c_t}{\partial m_t^{\xi}} - E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\zeta+\vartheta}}}{r_{t+1}^{\zeta+\vartheta} - r_{t+1}^{\xi}}$$

$$\lambda_t = E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\$}} + E \left(\frac{\lambda_{t+1}}{1+\dot{P}_{t+1}}\right) E(1 + r_{t+1}{}^{\$}) \xRightarrow{E \left(\frac{\lambda_{t+1}}{1+\dot{P}_{t+1}}\right) = \frac{E\beta^t uc_t \times \frac{\partial c_t}{\partial m_t^{\xi}} - E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\zeta+\vartheta}}}{r_{t+1}^{\zeta+\vartheta} - r_{t+1}^{\xi}}} \lambda_t = E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\$}} + \frac{E\beta^t uc_t \times \frac{\partial c_t}{\partial m_t^{\xi}} - E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\zeta+\vartheta}}}{r_{t+1}^{\zeta+\vartheta} - r_{t+1}^{\xi}} E(1 + r_{t+1}{}^{\$})$$

$$\xRightarrow{uc_t=\lambda_t} uc_t = E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\$}} + \frac{E\beta^t uc_t \times \frac{\partial c_t}{\partial m_t^{\xi}} - E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\zeta+\vartheta}}}{r_{t+1}^{\zeta+\vartheta} - r_{t+1}^{\xi}} E(1 + r_{t+1}{}^{\$}) \xRightarrow{um_t^{\psi} + E\lambda_{t+1} \left(\frac{1}{1+\dot{P}_{t+1}}\right) = uc_t}$$

$$um_t^{\psi} + E\lambda_{t+1}\left(\frac{1}{1+P_{t+1}}\right) =$$

$$E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\$}} + \frac{E\beta^t uc_t \times \frac{\partial c_t}{\partial m_t^{\xi}} - E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\zeta+\vartheta}}}{r_{t+1}^{\zeta+\vartheta} - r_{t+1}^{\xi}} E\left(1 + r_{t+1}{}^{\$}\right) \xRightarrow{E\left(\frac{\lambda_{t+1}}{1+P_{t+1}}\right) = \frac{E\beta^t uc_t \times \frac{\partial c_t}{\partial m_t^{\xi}} - E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\zeta+\vartheta}}}{r_{t+1}^{\zeta+\vartheta} - r_{t+1}^{\xi}}} um_t^{\psi} =$$

$$E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\$}} + \frac{E\beta^t uc_t \times \frac{\partial c_t}{\partial m_t^{\xi}} - E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\zeta+\vartheta}}}{r_{t+1}^{\zeta+\vartheta} - r_{t+1}^{\xi}} E\left(1 + r_{t+1}{}^{\$}\right) - \frac{E\beta^t uc_t \times \frac{\partial c_t}{\partial m_t^{\xi}} - E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\zeta+\vartheta}}}{r_{t+1}^{\zeta+\vartheta} - r_{t+1}^{\xi}} \Longrightarrow um_t^{\psi} = E\beta^t uc_t \times$$

$$\frac{\partial c_t}{\partial k_t^{\$}} + \frac{E\beta^t uc_t \times \frac{\partial c_t}{\partial m_t^{\xi}} - E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\zeta+\vartheta}}}{r_{t+1}^{\zeta+\vartheta} - r_{t+1}^{\xi}} E\left(r_{t+1}{}^{\$}\right)$$

$$\begin{cases} um_t^{\psi} = E\beta^t uc_t \times \dfrac{\partial c_t}{\partial k_t^{\$}} + \dfrac{E\beta^t uc_t \times \frac{\partial c_t}{\partial m_t^{\xi}} - E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\zeta+\vartheta}}}{r_{t+1}^{\zeta+\vartheta} - r_{t+1}^{\xi}} E\left(r_{t+1}{}^{\$}\right) \\ uc_t = E\beta^t uc_t \times \dfrac{\partial c_t}{\partial k_t^{\$}} + \dfrac{E\beta^t uc_t \times \frac{\partial c_t}{\partial m_t^{\xi}} - E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\zeta+\vartheta}}}{r_{t+1}^{\zeta+\vartheta} - r_{t+1}^{\xi}} E\left(1 + r_{t+1}{}^{\$}\right) \end{cases}$$

According to Bordo and Choudri (1982) and efficient markets hypothesis, the futures rate is good Measure of exchange expected rate and it is "risk neutral". So futures rates provide an unbiased forecast of future spot rates, and entering the futures market prices as a proxy for exchange rates, we review the effect of future market of exchange rates on money demand for in Iran's economy. To do this, we replace _f^_# $g with Vs_ b$ st $ − 1W that u O$ is futures price of exchange market and u_ $ is Dollar price at the present time in Iran's economy. So we have:

$$\begin{cases} um_t^{\psi} = E\beta^t uc_t \times \dfrac{\partial c_t}{\partial k_t^{\$}} + \dfrac{E\beta^t uc_t \times \frac{\partial c_t}{\partial m_t^{\xi}} - E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\zeta+\vartheta}}}{r_{t+1}^{\zeta+\vartheta} - r_{t+1}^{\xi}} \left(\dfrac{p_t{}^{c\$}}{p_t^{\$}} - 1\right) \\ uc_t = E\beta^t uc_t \times \dfrac{\partial c_t}{\partial k_t^{\$}} + \dfrac{E\beta^t uc_t \times \frac{\partial c_t}{\partial m_t^{\xi}} - E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\zeta+\vartheta}}}{r_{t+1}^{\zeta+\vartheta} - r_{t+1}^{\xi}} \left[1 + \left(\dfrac{p_t{}^{c\$}}{p_t^{\$}} - 1\right)\right] \end{cases}$$

If utility function is supposed to be Cobb-Douglas, marginal utilities of consumption and cash holdings would be:

$$U\left(c_t, m_t^{\psi}\right) =$$

$$(1-\eta)^{-1}\left[c_t{}^{\delta}(m_t^{\psi})^{\tau}\right]^{(1-\eta)}$$

$$\Rightarrow \begin{cases} uc_t = (1-\eta)^{-1}(1-\eta)\delta c_t{}^{\delta(1-\eta)-1} \times (m_t^{\psi})^{\tau(1-\eta)} = \delta c_t{}^{\delta(1-\eta)-1} \times (m_t^{\psi})^{\tau(1-\eta)} \\ um_t^{\psi} = (1-\eta)^{-1}(1-\eta)\tau c_t{}^{\delta(1-\eta)} \times (m_t^{\psi})^{\tau(1-\eta)-1} = \tau c_t{}^{\delta(1-\eta)} \times (m_t^{\psi})^{\tau(1-\eta)-1} \end{cases}$$

By replacing them in Lagrange relations, money demand function will be obtained.

$$\frac{uc_t}{um_t^{\psi}} = \frac{\delta m_t^{\psi}}{\tau c_t} \Rightarrow \frac{\delta m_t^{\psi}}{\tau c_t} = \frac{E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\$}} + \frac{E\beta^t uc_t \times \frac{\partial c_t}{\partial m_t^{\xi}} - E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\zeta+\vartheta}}}{r_{t+1}^{\zeta+\vartheta} - r_{t+1}^{\xi}} \left[\frac{p_t{}^{c\$}}{p_t^{\$}}\right]}{E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\$}} + \frac{E\beta^t uc_t \times \frac{\partial c_t}{\partial m_t^{\xi}} - E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\zeta+\vartheta}}}{r_{t+1}^{\zeta+\vartheta} - r_{t+1}^{\xi}} \left[\frac{p_t{}^{c\$}}{p_t^{\$}} - 1\right]} \Rightarrow$$

$$m_t^{\psi} = \frac{\tau c_t \left[\left(E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\$}}\right) + \left[\frac{E\beta^t uc_t \times \frac{\partial c_t}{\partial m_t^{\xi}} - E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\zeta+\vartheta}}}{r_{t+1}^{\zeta+\vartheta} - r_{t+1}^{\xi}} \left[\frac{p_t{}^{c\$}}{p_t^{\$}}\right]\right]\right]}{\delta \left[\left(E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\$}}\right) + \left[\frac{E\beta^t uc_t \times \frac{\partial c_t}{\partial m_t^{\xi}} - E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\zeta+\vartheta}}}{r_{t+1}^{\zeta+\vartheta} - r_{t+1}^{\xi}} \left[\frac{p_t{}^{c\$}}{p_t^{\$}} - 1\right]\right]\right]}$$

$$m_t^{\psi} = \frac{\tau c_t}{\delta} \frac{\left[\left(E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\$}}\right) + \left[\frac{E\beta^t uc_t \times \frac{\partial c_t}{\partial m_t^{\xi}} - E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\zeta+\vartheta}}}{r_{t+1}^{\zeta+\vartheta} - r_{t+1}^{\xi}} \left[\frac{p_t{}^{c\$}}{p_t^{\$}} - 1\right] + \frac{E\beta^t uc_t \times \frac{\partial c_t}{\partial m_t^{\xi}} - E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\zeta+\vartheta}}}{r_{t+1}^{\zeta+\vartheta} - r_{t+1}^{\xi}}\right]\right]}{\left[\left(E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\$}}\right) + \left[\frac{E\beta^t uc_t \times \frac{\partial c_t}{\partial m_t^{\xi}} - E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\zeta+\vartheta}}}{r_{t+1}^{\zeta+\vartheta} - r_{t+1}^{\xi}} \left[\frac{p_t{}^{c\$}}{p_t^{\$}} - 1\right]\right]\right]}$$

$$m_t^{\psi} = \frac{\tau c_t}{\delta} [1 + \frac{\frac{E\beta^t uc_t \times \frac{\partial c_t}{\partial m_t^{\xi}} - E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\zeta+\vartheta}}}{r_{t+1}^{\zeta+\vartheta} - r_{t+1}^{\xi}}}{\left[\left(E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\$}}\right) + \left[\frac{E\beta^t uc_t \times \frac{\partial c_t}{\partial m_t^{\xi}} - E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\zeta+\vartheta}}}{r_{t+1}^{\zeta+\vartheta} - r_{t+1}^{\xi}} \left[\frac{p_t{}^{c\$}}{p_t^{\$}} - 1\right]\right]\right]}$$

$$m_t^{\psi} = \frac{\tau c_t}{\delta} [1 + \frac{E\beta^t uc_t \times \frac{\partial c_t}{\partial m_t^{\xi}} - E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\zeta+\vartheta}}}{\left[\left(E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\$}}\right)\left(r_{t+1}^{\zeta+\vartheta} - r_{t+1}^{\xi}\right) + \left[\left(E\beta^t uc_t \times \frac{\partial c_t}{\partial m_t^{\xi}} - E\beta^t uc_t \times \frac{\partial c_t}{\partial k_t^{\zeta+\vartheta}}\right)\left[\frac{p_t{}^{c\$}}{p_t^{\$}} - 1\right]\right]\right]}$$

RESULTS AND DISCUSSION

According to the obtained relationship, it concludes that increasing in expected interest rates leads to increase in the money demand. Also increasing the expected rate of return, portfolio of storable assets, housing, land and exchange assets money demand will decreases. Tobin in his liquidity preference argument states that when people anticipate the prices to lessen, then saving would lead to a loss and they will decide to keep cash and since their estimations about whether interest rates will pick up or fall and to some extent these changes will occur would be diverse and extensive, they will prefer to keep money (Tobin, 1985). Considering the final equation, it concluded that increase in futures prices of exchange rates reduces the money demand.

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