MICROFOUNDATION OF MONEY DEMAND: HOUSEHOLD INCOME FACTOR ANALYSIS

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ABSTRACT: *This research is intended to know: (1) How much the influence of fixed income, non-fixed income and legacy on the demand for holding cash money, both directly and indirectly through financial investment and consumption of durable goods; (2) How much the influence of financial investment on the demand for holding cash money, both directly and indirectly through consumption of durable goods. The unit of analysis are the head of household who have job and income and live in the city of Makassar. The method of analysis employed is the estimation method of simultaneous equation. The research findings indicate that microeconomic aspects (fixed income and non-fixed income) have a positive effect on the demand for holding cash money. Meanwhile, another microeconomic aspect, i.e. legacy, does not affect the demand for holding cash money. However, overall, the classical theory of money demand, has proven in this research.*

Keywords: demand for holding cash money, microfoundation, income and legacy

1. INTRODUCTION

The theory of money demand from monetarist and keynesian, in macroeconomic analysis, has agreed that money demand will always equal to money supply. It makes the central bank, in increasing the supply of money, just look at the macroeconomic variables that affect the demand for money. In other words, to maintain economic stability, the central bank will always assume that the demand for money will be equal to the supply of money (equilibrium) in the long run.

The same thing also happened in Indonesia. Where, the central bank has always considered that the demand for money is only affected by the macroeconomic variables. But, is it true? Money demand will always equal to money supply? How about the microeconomic aspect of money demand [1-6]?

In fact, if we look at the classical theory of money demand, microeconomic aspects always been the main focus [7]. The main factor that determine the demand for money in the classical theory is income variable [8,9]. In addition, saving/consumption behavior also has an impact on the demand for money [10,11]. Thus, the missing link between macroeconomy and microeconomy can be traced. Here, the classical theory questioned the monetary policy in determining the supply of money which is known not enough to represent money demand which are actually. Therefore, the monetarist doctrine related to the neutrality of money (money supply equal to money demand in the long run) must be questioned. It also has the support from Keynes, especially related to his criticism of the say's law which states that supply will always creates its own demand.

The central bank policy that only focus on macroeconomic aspects of money demand (such as the level of GDP and interest rate), can cause a disequilibrium (over money supply) in financial market. It is also cause inflation. Therefore, this research will focus to analyze the microfoundation of money demand which can be useful as an input for the monetary authorities, particularly related to its role in controlling the money supply.

MATERIAL AND METHODS

The data used in this research is primary data obtained from 289 respondents (head of household who have a job and income) in Makassar City, Indonesia. Meanwhile, the Simultaneous Equation Model (SEM) in this research can be seen in Figure 1 and the following functional equation:

$$Y_1 = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 X_3 + \mu_1 \quad (1)$$

$$Y_2 = \beta_0 + \beta_1 Y_1 + \beta_2 X_1 + \beta_3 X_2 + \beta_4 X_3 + \mu_2 \quad (2)$$

$$Y_3 = \gamma_0 + \gamma_1 Y_1 + \gamma_2 Y_2 + \gamma_3 X_1 + \gamma_4 X_2 + \gamma_5 X_3 + \mu_3 \quad (3)$$

Where, Y_3 is demand for holding cash money (the average cash per month in the last three months), measured in rupiah; Y_2 is consumption of durable goods (the average consumption of durable goods per year in the last five years), measured in rupiah; Y_1 is financial investment (the total value of savings, bank deposits, the purchase of shares or securities and insurance in the last five years), measured in rupiah; X_1 is fixed income (per month), measured in rupiah; X_2 is non-fixed income (per month), measured in rupiah; X_3 is legacy (all treasures controlled or determined by the heir to the respondent), measured in rupiah; α_0, β_0 and γ_0 are constants; α_1, ... α_n, β_1 ... β_n and γ_1 ... γ_n are each as parameters to be estimated; μ_1, μ_2 and μ_3 are random error terms.

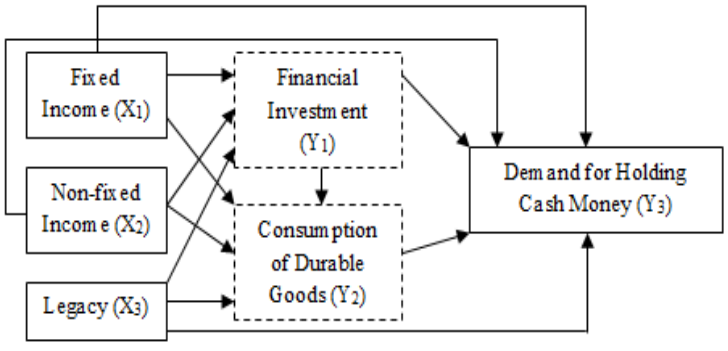


Figure 1. Conceptual Framework

The reduced form based on Equation 1-3 can be presented in the following equation:

$$Y_1 = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 X_3 + \mu_1 \quad (4)$$

$$Y_2 = \Omega_0 + \Omega_1 X_1 + \Omega_2 X_2 + \Omega_3 X_3 + \mu_{12} \quad (5)$$

$$Y_3 = \lambda_0 + \lambda_1 X_1 + \lambda_2 X_2 + \lambda_3 X_3 + \mu_{123} \quad (6)$$

Where, α_0, Ω_0 ($\beta_0 + \alpha_0\beta_1$) and λ_0 ($\gamma_0 + \alpha_0\gamma_1 + \beta_0\gamma_2 + \alpha_0\beta_1\gamma_2$) are constants; α_1, ... α_n, Ω_1 ... Ω_n and λ_1 ... λ_n are the total effects of variable $X_1,\ldots,X_n$ to variable $Y_1,\ldots,Y_n$; μ_{12} ($\mu_2 + \mu_1\beta_1$) and μ_{123} ($\mu_3 + \mu_1\gamma_1 + \mu_2\gamma_2 + \mu_1\beta_1\gamma_2$) are composites random error. The reduced form also can be presented in Tabel 1.

Table 1. Coefficient Symbols of the Direct, Indirect and Total Effect

No.	Directions of Effect	Coefficient Symbols		
		Direct Effect	Indirect Effect	Total Effect
1	a) $X_1 \rightarrow Y_3$ (λ_1)	γ_3		$\gamma_3 + \alpha_1\gamma_1 + \beta_2\gamma_2 + \alpha_1\beta_1\gamma_2$
	Through Y_1		$\alpha_1\gamma_1$	
	Through Y_2		$\beta_2\gamma_2$	
	Through Y_1 & Y_2		$\alpha_1\beta_1\gamma_2$	
	b) $X_1 \rightarrow Y_1$	α_1		α_1
	c) $X_1 \rightarrow Y_2$ (Ω_1)	β_2		$\beta_2 + \alpha_1\beta_1$
	Through Y_1		$\alpha_1\beta_1$	
2	a) $X_2 \rightarrow Y_3$ (λ_2)	γ_4		$\gamma_4 + \alpha_2\gamma_1 + \beta_3\gamma_2 + \alpha_2\beta_1\gamma_2$
	Through Y_1		$\alpha_2\gamma_1$	
	Through Y_2		$\beta_3\gamma_2$	
	Through Y_1 & Y_2		$\alpha_2\beta_1\gamma_2$	
	b) $X_2 \rightarrow Y_1$	α_2		α_2
	c) $X_2 \rightarrow Y_2$ (Ω_2)	β_3		$\beta_3 + \alpha_2\beta_1$
	Through Y_1		$\alpha_2\beta_1$	
3	a) $X_3 \rightarrow Y_3$ (λ_3)	γ_5		$\gamma_5 + \alpha_3\gamma_1 + \beta_4\gamma_2 + \alpha_3\beta_1\gamma_2$
	Through Y_1		$\alpha_3\gamma_1$	
	Through Y_2		$\beta_4\gamma_2$	
	Through Y_1 & Y_2		$\alpha_3\beta_1\gamma_2$	
	b) $X_3 \rightarrow Y_1$	α_3		α_3
	c) $X_3 \rightarrow Y_2$ (Ω_3)	β_4		$\beta_4 + \alpha_3\beta_1$
	Through Y_1		$\alpha_3\beta_1$	
4	a) $Y_1 \rightarrow Y_3$	γ_1		$\gamma_1 + \beta_1\gamma_2$
	Through Y_2		$\beta_1\gamma_2$	
	b) $Y_1 \rightarrow Y_2$	β_1		β_1

Source: Equation 1-6

2. RESULTS AND DISCUSSION

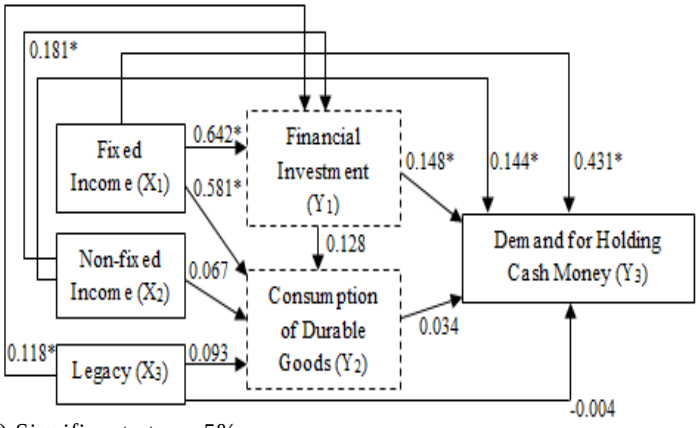
The estimate results of this research can be seen in Table 2 and Figure 2. The R square value of the demand for holding cash money (R^2Y_3) which is still low, indicates that there are still some variables other than income variable and saving/consumption behavior which affect the demand for money. To that end, the following researchers could try to analyze other factors such as demography factor in analyzing the demand for money. Nevertheless, this research is still very useful to analyze the role of income variable and saving/consumption behavior on the demand for money which still very rare.

Table 2. The Estimate Results

Directions of Effect	Regression Coefficients	t-Statistic	Prob.
$X_1 => Y_1$	0.642*	10.013	0.000
$X_2 => Y_1$	0.181*	3.692	0.000
$X_3 => Y_1$	0.118*	4.901	0.000
$Y_1 => Y_2$	0.128	1.143	0.253
$X_1 => Y_2$	0.581*	4.096	0.000
$X_2 => Y_2$	0.067	0.700	0.484
$X_3 => Y_2$	0.093	1.942	0.052
$Y_1 => Y_3$	0.148*	3.032	0.002
$Y_2 => Y_3$	0.034	1.325	0.185
$X_1 => Y_3$	0.431*	6.801	0.000
$X_2 => Y_3$	0.144*	3.484	0.000
$X_3 => Y_3$	-0.004	-0.171	0.864

*) Significant at α = 5%;
R^2Y_1 = 0.324;
R^2Y_2 = 0.115;
R^2Y_3 = 0.324;
N = 289

Source: Appendix



*) Significant at α = 5%

Figure 2. Framework of the Estimate Results

Meanwhile, the direct, indirect, and total effect of all exogenous variable in this research, can be seen in Table 3. Starting from the analysis of fixed income, the direct effect of fixed income on the demand for holding cash money shows a positive and significant relationship. This means that an increase in fixed income will increase the demand for holding cash money, vice versa. These results are consistent with the the classical theory (hypothesis) which states that microeconomic aspect such as fixed income have a positive effect on the demand for money. It is also confirmed the keynesian theory of money demand, especially related by the transaction and precautionary motive [8,9,12-14].

Table 3. Regression Coefficients of the Direct, Indirect and Total Effect

No.	Directions of Effect	Regression Coefficients		
		Direct Effect	Indirect Effect	Total Effect
1	a) $X_1 \rightarrow Y_3$	0.431*		0.548
	Through Y_1		0.095*	
	Through Y_2		0.019	
	Through Y_1 & Y_2		0.003	
	b) $X_1 \rightarrow Y_1$	0.642*		0.642*
	c) $X_1 \rightarrow Y_2$	0.581*		0.663
	Through Y_1		0.082	
2	a) $X_2 \rightarrow Y_3$	0.144*		0.174
	Through Y_1		0.027*	
	Through Y_2		0.002	
	Through Y_1 & Y_2		0.001	
	b) $X_2 \rightarrow Y_1$	0.181*		0.181*
	c) $X_2 \rightarrow Y_2$	0.067		0.090

No.	Directions of Effect	Regression Coefficients		
		Direct Effect	Indirect Effect	Total Effect
	Through Y_1		0.023	
3	a) $X_3 \rightarrow Y_3$	-0.004		0.017
	Through Y_1		0.017*	
	Through Y_2		0.003	
	Through Y_1 & Y_2		0.001	
	b) $X_3 \rightarrow Y_1$	0.118*		0.118*
	c) $X_3 \rightarrow Y_2$	0.093		0.108
	Through Y_1		0.015	
4	a) $Y_1 \rightarrow Y_3$	0.148*		0.152
	Through Y_2		0.004	
	b) $Y_1 \rightarrow Y_2$	0.128		0.128
*) Significant at α = 5%				

Source: Appendix

The direct effect of fixed income on the financial investment shows a positive and significant relationship. This means that an increase in fixed income will increase financial investment, vice versa. These results are consistent with the view (hypothesis) which states that an increase in individual income will cause the individual tend to save the money [2,8,9,12-14].

The direct effect of fixed income on the consumption of durable goods shows a positive and significant relationship. This means that an increase in fixed income will increase consumption of durable goods, vice versa. These results are consistent with the view (hypothesis) which states that an increase in individual income will cause the individual also tend to spend the money [2,8,9,12-14].

Meanwhile, the direct effect of non-fixed income on the demand for holding cash money shows a positive and significant relationship. This means that an increase in non-fixed income will increase the demand for holding cash money, vice versa. These results are consistent with the classical theory (hypothesis) which states that microeconomic aspect such as non-fixed income have a positive effect on the demand for money. It is also confirmed the Keynesian theory of money demand, especially related by the transaction and precautionary motive [8,9,12-14].

The direct effect of non-fixed income on the financial investment shows a positive and significant relationship. This means that an increase in non-fixed income will increase financial investment, vice versa. These results are consistent with the view (hypothesis) which states that an increase in individual income will cause the individual tend to save the money [2,8,9,12-14].

The direct effect of non-fixed income on the consumption of durable goods shows an insignificant relationship. This means that a change in non-fixed income will not affect the consumption of durable goods. These results are not consistent with the view (hypothesis) which states that an increase in individual income such as non-fixed income will cause the individual tend to spend the money [2,8,9,12-14]. This indicates that respondents in this research are very realistic and will not speculate in consuming the durable goods. Non-fixed income will mostly be used only for saving.

Furthermore, the direct effect of legacy on the demand for holding cash money shows an insignificant relationship. This means that a change in legacy will not affect the demand for holding cash money. These results are not consistent with the classical theory (hypothesis) which states that microeconomic aspect such as legacy have a positive effect on the demand for money [8,9,12-14]. This indicates that respondents in this research using their legacy only for a long-term purposes, such as saving their money in the bank.

The direct effect of legacy on the financial investment shows a positive and significant relationship. This means that an increase in legacy will increase financial investment, vice versa. These results are consistent with the view (hypothesis) which states that an increase in individual income (legacy) will cause the individual tend to save the money [2,8,9,12-14].

The direct effect of legacy on the consumption of durable goods shows an insignificant relationship. This means that a change in legacy will not affect the consumption of durable goods. These results are not consistent with the view (hypothesis) which states that an increase in individual income such as legacy will cause the individual also tend to spend the money [2,8,9,12-14].

Switch to the effect of intervening endogenous variables i.e. financial investment, the direct effect of financial investment on the demand for holding cash money shows a positive and significant relationship. This means that an increase in financial investment will increase the demand for holding cash money, vice versa. These results are not consistent with the view (hypothesis) which states that financial investment and the demand for money have a negative relationship [10,11,15,16]. This indicates that respondents in this research have a lot of savings (came from fixed-income, non-fixed income and legacy) so that the demand for money which will be used for transaction and precautionary remains high.

The direct effect of financial investment on the consumption of durable goods shows an insignificant relationship. This means that a change in financial investment will not affect the consumption of durable goods. These results are not consistent with the view (hypothesis) which states that an increase in financial investment will cause the individual tend to reduce their consumption [10,11,15,16]. This indicates that respondents in this research using their savings only for a short-term purposes.

Meanwhile, the direct effect of consumption of durable goods on the demand for holding cash money shows an insignificant relationship. This means that a chnage in consumption of durable goods will not affect the demand for holding cash money. These results are not consistent with the view (hypothesis) which states that consumption of durable goods and the demand for money have a positive relationship [10,11,15,16].

4. CONCLUSION

The conclusion of the research as follows:

- The classical theory which states that microeconomic aspect (such as fixed income and non-fixed income) can affect the demand for money, has proven. It is also confirmed the keynesian theory of money demand, especially related by the transaction and precautionary motive.

- Respondents in this research are very realistic and will not speculate in consuming the durable goods. Non-fixed income will mostly be used only for saving.
- Another microeconomic aspect i.e. legacy, will not affect the demand for money. This indicates that respondents in this research using their legacy only for a long-term purposes, such as saving their money in the bank.
- Respondents in this research have a lot of savings (came from fixed-income, non-fixed income and legacy) so that the demand for money which will be used for transaction and precautionary remains high.
- Respondents in this research using their savings only for a short-term purposes.
- There are still some variables other than income variable and saving/consumption behavior which affect the demand for money. Nevertheless, this research is still very useful to analyze the role of income variable and saving/consumption behavior on the demand for money which still very rare.
- The central bank, in increasing the money supply, should consider the microeconomic aspects of the demand for money. This is to prevent excess money supply which can cause inflation.
- Following researchers could try to analyze other factors such as demography factor in analyzing the demand for money.

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APPENDIX

AMOS Results
Estimates (Group number 1 - Default model)
Scalar Estimates (Group number 1 - Default model)
Maximum Likelihood Estimates

Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
y1	<---	x1	.642	.064	10.013	***	par_1
y1	<---	x2	.181	.049	3.692	***	par_2
y1	<---	x3	.118	.024	4.901	***	par_3
y1	<---	e1	.560	.023	24.000	***	par_7
y2	<---	y1	.128	.112	1.143	.253	par_4
y2	<---	x1	.581	.142	4.096	***	par_6
y2	<---	e2	1.067	.044	24.000	***	par_8
y2	<---	x2	.067	.095	.700	.484	par_10
y2	<---	x3	.093	.048	1.942	.052	par_11
y3	<---	y2	.034	.026	1.325	.185	par_5
y3	<---	e3	.463	.019	24.000	***	par_9
y3	<---	x1	.431	.063	6.801	***	par_12
y3	<---	x2	.144	.041	3.484	***	par_13
y3	<---	x3	-.004	.021	-.171	.864	par_14
y3	<---	y1	.148	.049	3.032	.002	par_15

Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
y1	<---	x1	.485
y1	<---	x2	.179
y1	<---	x3	.237
y1	<---	e1	.822
y2	<---	y1	.077
y2	<---	x1	.264
y2	<---	e2	.941
y2	<---	x2	.040

			Estimate
y2	<---	x3	.112
y3	<---	y2	.068
y3	<---	e3	.822
y3	<---	x1	.394
y3	<---	x2	.173
y3	<---	x3	-.009
y3	<---	y1	.179

Variances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P	Label
e1	2.000				
e2	2.000				
e3	2.000				
x1	.529	.044	12.000	***	par_16
x2	.910	.076	12.000	***	par_17
x3	3.763	.314	12.000	***	par_18

Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
y1	.324
y2	.115
y3	.324

Matrices (Group number 1 - Default model)

Factor Score Weights (Group number 1 - Default model)

Total Effects (Group number 1 - Default model)

	x3	x2	x1	y1	y2
y1	.118	.181	.642	.000	.000
y2	.108	.090	.664	.128	.000
y3	.018	.174	.549	.153	.034

Standardized Total Effects (Group number 1 - Default model)

	x3	x2	x1	y1	y2
y1	.237	.179	.485	.000	.000
y2	.130	.053	.301	.077	.000
y3	.043	.209	.501	.184	.068

Direct Effects (Group number 1 - Default model)

	x3	x2	x1	y1	y2
y1	.118	.181	.642	.000	.000
y2	.093	.067	.581	.128	.000
y3	-.004	.144	.431	.148	.034

Standardized Direct Effects (Group number 1 - Default model)

	x3	x2	x1	y1	y2
y1	.237	.179	.485	.000	.000
y2	.112	.040	.264	.077	.000
y3	-.009	.173	.394	.179	.068

Indirect Effects (Group number 1 - Default model)

	x3	x2	x1	y1	y2
y1	.000	.000	.000	.000	.000
y2	.015	.023	.082	.000	.000
y3	.021	.030	.118	.004	.000

Standardized Indirect Effects (Group number 1 - Default model)

	x3	x2	x1	y1	y2
y1	.000	.000	.000	.000	.000
y2	.018	.014	.037	.000	.000
y3	.051	.036	.107	.005	.000

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