

**EFFECTS OF HIGHER ORDER INTERACTION IN MONEY SUPPLY OF A
COUNTRY**

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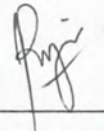
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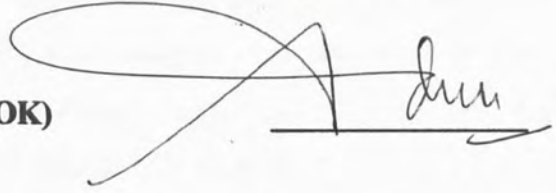
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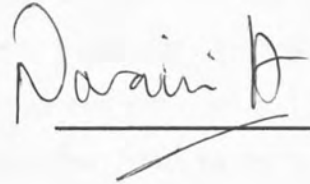


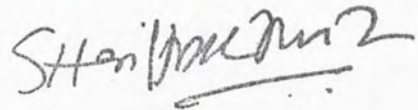
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ABSTRACT

The money supply of a country is a very crucial aspect to be studied because it affects the whole workings of a country. The main purpose of this research is mainly to obtain the best model to decide the factors that influence the money supply of a country. The model will help the government to decide how much money is to be in circulation in future. In this research, the multiple regressions method is used to obtain the selected model. Then, the eight model selection criteria will be used to gain the best model. The interaction factor affecting the money supply is taken into consideration. Analysis up to the fifth order of interaction is considered. While the analysis is carried out, the model selected is analysed to see the effects and trends of the interaction. So, this research can show the characteristics of the variables and the significance of the higher order interaction variables. The best model is obtained and the significant variables include the highest order of interaction variable which is the fifth order interaction. By using the best model, a forecast will be carried out to predict the money supply. The forecast obtained is overestimating the money supply. It seems to have a relative deviation from the real value where it deviates about 5% from the real value. It shows that the forecast does not deviate too far from the real value. The results which are overestimated can be accepted in the money supply sector. This is because an overestimation of money supply provides a positive environment for the country which shows that the country is rich. So, the model obtained is a good model and it can be used in forecasting the money supply.



KESAN PEMBOLEHUBAH INTERAKSI PERINGKAT TINGGI YANG MEMPENGARUHI BEKALAN WANG SESEBUAH NEGARA.

ABSTRAK

Bekalan wang adalah suatu aspek yang amat penting untuk sesebuah negara kerana bekalan wang merupakan penentu bagi pembangunan sesebuah negara. Dengan itu, kajian ini cuba mendapatkan satu model terbaik yang boleh mewakili sifat bekalan wang supaya ia dapat membantu sesebuah negara untuk meramal bekalan wang yang perlu dibekalkan oleh sesebuah negara. Model terpilih akan diperolehi dengan menggunakan kaedah regresi berganda dan model terbaik akan diperolehi melalui lapan kriteria pemilihan model. Dalam kajian ini, pembolehubah interaksi diambil kira sehingga tertib kelima dan didapati bahawa pembolehubah interaksi peringkat tinggi adalah signifikan. Semasa menjalankan analisis, beberapa aspek telah diperhatikan bagi menganalisis sifat-sifat pembolehubah dalam model yang terpilih. Daripada kajian ini, ia dapat menyimpulkan beberapa sifat kesignifikan pembolehubah dalam sesuatu model dan pembolehubah interaksi tidak boleh diabaikan. Ini adalah kerana model terbaik yang diperolehi mempunyai pembolehubah interaksi peringkat tinggi yang signifikan selain daripada pembolehubah tunggal. Seterusnya, model terbaik yang diperolehi digunakan untuk meramal bekalan wang yang perlu dibekalkan oleh negara. Bekalan wang yang diramal didapati terpesong sedikit iaitu sekitar 5% daripada bekalan wang yang dibekalkan. Ramalan yang diperolehi ini, menunjukkan ramalan tersebut telah melebihi bekalan asal. Ini merupakan satu fenomena yang boleh diterima kerana bekalan yang lebih boleh meningkatkan imej negara dan ia boleh dikawal. Maka, model terbaik yang diperolehi ini merupakan satu model yang bagus kerana kepencongan ramalan yang kecil dan ia boleh digunakan untuk meramal bekalan wang sesebuah negara tanpa keraguan.



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CHAPTER 1

INTRODUCTION

1.1 Introduction of Dissertation

Money supply of a country plays a very important role in managing a country's economy. So, an effort is taken to research on the factors which are really needed to be considered before an amount of money to be released in future. It does not only take in consideration of the single factor effects only but also included the effects of the interaction between the factors on the money supply. It shows that, the main purpose of this dissertation is to find the best model which can be used to forecast the amount of money to be supplied in future.

1.2 Money

Money is anything that people are willing to accept in payment for goods and services or to pay off debts (Hubbard, 2000). Money is a medium which human being use to



exchange things and this directly will be an important financial asset in the economy. Actually money is just an invention which is used to simplify trade. The function of money is a standard value or unit of account in trading which is apparently to improve the barter system which is done in the old ages for trading goods or services. This is because the system was facing some problem where people cannot meet each others' need and satisfaction. Money also serves as a store of value because purchasing power can be stored in currency or in checking account until the times is right to buy it (Rose, 1997).

1.3 Money Supply

Money supply is an economic variable which is the total quantity of money in the economy of a country. The factors that give impact to money supply are the interest rate, inflation rate, and the gross national product (GNP) of a country. The money supply has an impact on interest rate, exchange rate, inflation, and economy's output of goods or service (Hubbard, 2000). This shows the importance of getting a good model which could help to forecast the amount of money needed in future. This is because the money supply gives a very big impact on the country's economy where it affects all other important economic factors and also the politics department.

All these factors depend on the monetary policy which is the management of the money supply and it links the entire economic variable. The monetary policy will depend on the monetary theory which explores the relationship linking the changes in money supply to changes in economic activities and prices.



The monetary theory can be different between countries because it depends on the government's policies and decisions.

The amount of money to be supplied in the country must be well decided by the government because the money supply will cause the decreasing of the currency value which will cause the standard of living to drop when the money supply is too much. While, if the money supply is insufficient to meet the demand of money, it will cause the citizens to live in difficulty because the standard of living is too high especially for the citizens staying in urban places. So, this shows that the government's decision on the amount of money supplied will affect the whole country especially when the economy faces recession.

The problem caused by money supply must be avoided by the government as it causes a lot of bad effects to the country. So, every country will have a central bank which is an institution designed to oversee the banking system and regulate the quantity of money in the economy (Mankiw, 2004). The central bank can control the money supply because if the Central Bank holds all the deposits in reserve than the supply of money will be fully controlled by them. All the extra money is hold by the Central Bank. This is a way of controlling the money supply where the bank does not hold all the deposits in reserve and create the fractional reserve ratio.

While the bank only holds a fraction of the deposits in reserve according to the reserve ratio decided. The rest of the deposits will be given out to be as loans to the customer where this is compulsory for a bank to create more money. This is because when money is loan out, then the money will be deposited in other banks and the bank



will reserve a ratio of the deposit. So, finally the total money supply will be the total money deposited in the entire bank. The amount of money circulate will be increasing as the money are circulated in the country and this will increase the amount of money in the bank. So, the control of the reserve ratio to a bank by the Central Bank can help to control the supply of money in the country.

In the next section, all the variables that considered are explained and all the variables will be tested to see which variables affect the money supply. So, a model which includes the factors that influence money supply will be obtained by searching the best model. Before the best model is obtained, the selected model must be searched first. The process will be done by using the multiple regressions analysis. Then, with the best model obtained by using the eight model selection criteria, the money supply can be forecasted to prepare the budget of the country.

1.3.1 Interest Rate

The interest rate is the borrower's cost on a loan and the lender's reward on the investment (Hubbard, 2000). The interest rate will affect an individual's decision about whether to borrow for spending or to save the money for future spending in bigger amount such as buying a house or for retirement planning. This is the affect for individual, while in economic aspects the interest rates helps guarantee that current savings will flow into investment to promote economic growth. It also rations the available supply credit where it generally providing loanable funds to those investment projects with the highest expected returns and it brings into balance the supply of money with the public's demand for money. Furthermore, it is also an



important tool of government policy through its influence on the volume of saving and investment (Rose, 1997).

1.3.2 Inflation Rate

Inflation is an economy-wide phenomenon that concerns the value of the economy's medium of exchange (Mankiw, 2004). So, inflation is a rise in the average level of prices for all goods and services. Inflation occurs when the average level of all prices in the economy rises or too many dollars chase too few goods. This happens when demand exceeds supply at or near full unemployment (Kaufman, 1995). It can cause wealth effect, income effect, income tax effect, and depreciation effect (Rose, 1997).

The wealth effect happens when the purchasing power is reduced and people cannot buy whatever they want and the income effect is the effect which causes people to reduce their money holding. People have to travel more frequently to the bank. The income tax effect occurs because the inflation is not considered by the tax law. So, the inflation tends to raise the tax burden on income earned from savings. The depreciation effect will happen because after tax income is less than it would be when there is no inflation. This will cause the profit to decrease and the contribution to the economy will be lowered and this can cause depreciation.

1.3.3 Gross National Product (GNP)

Gross National Product (GNP) is the total income earned by a nation's permanent residents called nationals and it is usually assessed quarterly or yearly. It includes the



income that our citizens earn abroad and excluding income that foreigners earn in the country (Mankiw, 2004). The GNP of a country will highly influence the money supply because of the flow of the money of a country when their citizens earn abroad. This is because if the citizens migrate, then a big amount of money will flow out of the country which causes the money in the economy to be reduced and affect the money supply.

GNP in current dollars is the GNP measuring the changes in overall levels of economic production from one year to the next using the money price. This will cause problem when measuring is done because money price differs in every year. So, the GNP constant is obtained by getting the real gross domestic product (GDP) in 1972 and transform it to GNP to compute a possible price index which can solve the different money price problem (Mankiw, 2004). The GNP computed is the GNP constant. It is not necessary to be 1972 but 1972 is chosen because for this year the price is more stable as the average yearly rate of growth from 1961 to 1973 rose to 3.9 percent which is the highest average rate of entire postwar period under review (Spulber, 1995).

1.4 Money Supply in Malaysia

According to Cheah (1997), the money supply in Malaysia was quite stable and it gradually increased since 1956. From this study, we can see that from 1956-1971, the amount of money supply increased gradually around 4% per year. From 1966-1970, the increment of the currency value decreasing to 3.4% per year because of the development in current deposit which increase the bank network in main cities. This



current deposit is growing very fast in 1956 where it increase from 1.8% in 1956 and it increase to 9.1% in 1966-1970. Furthermore, this growth satisfies the economy development of the country.

These happen because of the increment in the main item and the pressure of inflation. This cause the citizens to carry along a lot of cash because of the trading demand are very high. From 1976-1980, the Central Bank of Malaysia practice a very lenient monetary policy to encourage the economy development. So, this cause the increased of money supply in the country and this period the currency value was the highest rate. After 1980, the increment of the currency value starts to drop until the end of 1984 where it starts increasing.

The money supply increases very fast because there are lots of banks providing the facilities for the citizens to keep their extra money. Moreover, they can choose any bank that they feel beneficial to them. This is because they wish to maximize returns of their saving in bank. So, this will affect the supply of money and cause increment. Next, are the factors that decide the money supply in Malaysia. The government's debts are one of the main factors because the management of the government expenses will influence the money supply. There are other factors too such as the open economy in this country can cause the in and out flow of money and many other factors too which are decided by the government policies.



1.5 Research Objectives

This research will be studying about the money supply of a country. So, the research objective of this dissertation is as follow.

- i. To find out the possibility where money supply only depends on the interaction of main factors.
- ii. To verify the influence of higher order interaction variable to the money supply.
- iii. To verify the influence of main factors to the money supply.
- iv. To examine the contribution of main factors with the interaction factor to money supply.
- v. To examine the characteristic of the money supply and get a best model to describe the money supply.
- vi. To forecast the future money supply and compare the method of forecasting.

1.6 Research Scope

In this study, there are total of seven variables and the data were used as it is collected and no further information given after data were collected. So, there are two variables will be considered as unknown quantitative variable as their status are unknown. So, the variables are treated as continuous variables. The number of variables involved will not be confined only to the seven variables in a model because there are interactions variables involve. This study is to find the selected model which are selected by referring the p-value which is provided by the multiple regression test. In this study, only the variables discussed are considered to influence the money supply



where no other factors influence or other factors are considered remain the same. The best model will be obtained by using the eight model selection criteria. There is time constrained as the period is too short and this might cause some weaknesses to this study.



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