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THE IMPACT OF SELECTED FINANCIAL VARIABLES ON MAJOR SECTORAL OUTPUT IN MALAYSIA AND SINGAPORE

NUR HANIM BINTI ABD. GHANI

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NUR HANIM BINTI ABD. GHANI

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NUR HANIM ABD. GHANI

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Chairman: Dr. Azali Mohamed

Faculty: Economics and Management

This study empirically investigates the impact of four selected financial variables namely money supply, treasury bill rate, credit supply and exchange rate on major sectoral output such as agriculture, manufacturing and services in Malaysia and Singapore economies. The Granger causality of Vector Error Correction Model (VECM) was utilized in this study.

Generally, this study has revealed that money supply, treasury bill rate, credit supply, exchange rate and three major sectoral output in both countries are cointegrated. Hence, the presence of cointegrating vector indicates that these variables stay close to each other and do not drift far apart in the long-run although they may diverge from each other in the short-run.

The estimates of the VECM models for the Malaysian agriculture and manufacturing sectors show that the agriculture output, manufacturing output and treasury bill rate are considered as endogenous variables, whereas money supply,

credit supply and exchange rate are found to be weakly exogenous. For the Malaysian services sector, the results show that money supply, credit supply and services output variables are endogenous. This implies that these variables adjust to short-run deviations from long-run equilibrium.

For the case of Singapore agriculture sector, money supply and agriculture output variables are identified as endogenous variables in the model and the manufacturing output alongside all selected financial variables except credit supply are found important for the short-run adjustment. The exchange rate in the Singapore services sector is identified as weakly exogenous variable.

Based on the Granger causality analysis using the VECM framework, the credit supply has a significant effect on all the three major sectors in Malaysia. Treasury bill rate and exchange rate are found to influence the manufacturing and services output performance. Meanwhile, money supply can be used to control the fluctuations in services sector.

For the case of the Singapore economy, all four selected financial variables are found to affect all three major sectors. Specifically, the results revealed that there are several significant relationships (bi-directional) namely between treasury bill rate and the agriculture output, between money supply and the manufacturing output and between credit supply and manufacturing output. For the services sector, bi-directional causal relationships occurred between treasury bill rate and the services output, and between exchange rate and services output performance.

Overall, the impacts of the financial variables on output performances are specified to the sectors concerned. Therefore, selective policy action could be drawn as appropriate due to non-uniformity of the impact of the financial variables on those sectors.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

KESAN PEMBOLEH UBAH KEWANGAN TERPILIH KE ATAS OUTPUT SEKTOR UTAMA DI MALAYSIA DAN SINGAPURA

Oleh

NUR HANIM ABD. GHANI

Mei 2002

Pengerusi: Dr. Azali Mohamed

Fakulti : Ekonomi dan Pengurusan

Tujuan utama kajian ini adalah untuk mengkaji secara empirikal ke atas empat pembolehubah kewangan terpilih seperti penawaran wang, bil perbendaharaan, penawaran kredit dan kadar pertukaran asing terhadap keluaran sektor utama iaitu sektor pertanian, pembuatan dan sektor perkhidmatan di Malaysia dan Singapura. Analisis penyebab Granger dalam 'Vector Error Correction Model (VECM)' telah digunakan di dalam kajian ini.

Secara keseluruhannya, kajian ini telah menunjukkan bahawa penawaran wang, bil perbendaharaan, penawaran kredit, pertukaran matawang asing dan keluaran bagi ketiga-tiga sektor utama untuk kedua-dua negara yang dikaji adalah berkointegrasi. Oleh itu, kewujudan vektor kointegrasi mencadangkan bahawa kesemua pembolehubah adalah beriringan di antara satu sama lain dan tidak berjauhan dalam jangka masa panjang walaupun dalam jangka pendek, pembolehubah–pembolehubah ini mungkin tidak hampir di antara satu sama lain.

Penganggaran model VECM untuk sektor pertanian dan pembuatan di Malaysia menunjukkan bahawa output pertanian, output pembuatan dan bil perbendaharan dikenalpasti sebagai pembolehubah endogenos, manakala penawaran wang, penawaran kredit dan pertukaran matawang asing adalah sebagai pembolehubah exogenos yang lemah. Bagi sektor perkhidmatan di Malaysia, keputusan menunjukkan bahawa pembolehubah penawaran wang, penawaran kredit dan output sektor perkhidmatan adalah endogenos. Ini menunjukkan bahawa pembolehubah-pembolehubah tersebut menyelaras penyimpangan jangka pendek daripada keseimbangan jangka panjang.

Bagi sektor pertanian di Singapura, penawaran wang dan output pertanian dikenalpasti sebagai pembolehubah endogenos dan output sektor pembuatan di samping semua pembolehubah kewangan yang terpilih kecuali penawaran kredit didapati penting untuk penyelarasan jangka pendek. Kadar pertukaran matawang asing di dalam model sektor perkhidmatan di Singapura dikenapasti sebagai pembolehubah exogenos yang lemah.

Berdasarkan kepada analisis penyebab Granger dalam rangka kerja VECM, penawaran kredit adalah signifikan dalam mempengaruhi kesemua sektor utama di Malaysia. Bil perbendaharaan serta kadar pertukaran asing telah ditemui untuk mempengaruhi prestasi output di sektor pembuatan dan perkhidmatan. Sementara itu, penawaran wang boleh digunakan untuk mengawal turun naik prestasi sektor perkhidmatan.

Bagi kes ekonomi Singapura, semua pembolehubah kewangan yang dipilih memberi kesan ke atas output bagi semua sektor utama. Secara spesifiknya, keputusan telah menunjukkan bahawa terdapat beberapa hubungan dua hala, seperti di antara bil perbendaharan dan output sektor pertanian, di antara penawaran wang dan output sektor pembuatan dan di antara penawaran kredit dengan output sektor pembuatan. Bagi sektor perkhidmatan pula, hubungan dua hala wujud di antara bil perbendaharan dan output bagi sektor perkhidmatan serta di antara kadar pertukaran asing dan output sektor ini.

Secara keseluruhannya, kesan pembolehubah kewangan ke atas prestasi output adalah spesifik mengikut sektor yang diambilkira di dalam kajian ini. Dengan ini, polisi yang sesuai perlu dipilih memandangkan ketidakseragaman kesan pembolehubah kewangan ke atas sektor tersebut.

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LYA_M	Agricultural output (Malaysia)
LYM_M	Manufacturing output (Malaysia)
LYS_M	Services output (Malaysia)
$LM2_M$	Broad money M2 (Malaysia)
$LTBR_M$	3-month treasury bill rate (Malaysia)
$LTCR_M$	Credit supply (Malaysia)
$LEXR_M$	Exchange rate (Malaysia)
LYA_S	Agricultural output (Singapore)
LYM_S	Manufacturing output (Singapore)
LYS_S	Services output (Singapore)
$LM2_S$	Broad money M2 (Singapore)
$LTBR_S$	3-month treasury bill rate (Singapore)
$LTCR_S$	Credit supply (Singapore)
$LEXR_S$	Exchange rate (Singapore)

CHAPTER I

INTRODUCTION

The importance of financial variables in preventing disastrous economic events such as severe inflation, recession, unemployment and unanticipated major output fluctuations had been widely examined. The early debates focused on non neutrality of money. This argument states that the money supply will ultimately induce the growth of output. Later, the studies focused on the behavior of the treasury bill rate which is believed to have a significant impact on output. Recently, financial liberalisation in financial markets especially in the developing countries has led the supply of credit play a major role in influencing output performance. With the growing globalisation of economies throughout the world, the exchange rate becomes an important factor that accounts for the fluctuation of output especially in the developed countries.

Studies on the relationship between financial variables and output have been extensively discussed to investigate the integration of these variables. However, the preceding studies reveal mixed results, namely there is no specific relationship. Recently, economists started to realize the advantage of using disaggregated data compared to the aggregated level[1]. This study attempts to empirically analyze the ambiguous issues regarding the integration between the financial variables (money supply, treasury bill rates, credit supply and the exchange rate) and sectoral output. This chapter is organized as follows: We start

[1] For example, Gauger (1988), Gauger aand Enders (1989), Dale and Haldane (1995) and Sheeley and Wallace (1998).

the usefulness of financial variables in the monetary policy of Malaysia and Singapore followed by the problem statement of the study. The objective and significance of the study are presented in the last section.

The Usefulness of the Selected Financial Variables as Monetary Policy in Malaysia and Singapore

In essence, up until the middle of 1990s, the traditional strategy based on monitoring money supply fluctuations is considered to be the most important tool in influencing economic performance in Malaysia. The central bank, also known as Bank Negara Malaysia (BNM) believed that this strategy was closely linked to its ultimate objective of achieving price stability[2]. The monitoring of money supply was to ensure that the supply of liquidity was sufficient to meet the needs of the economy and that the excess liquidity did not translate into acceleration in loans. This in turn will expand money supply beyond its target rate. Prior to 1987, the BNM had focused on narrow money supply as a suitable target. However, this variable has become less important for policy targeting with increasing financial liberalisation and innovation in the Malaysian economy. Consequently, greater emphasis is placed on the broad money aggregate.

Towards the mid-1990s especially with the large capital flows in 1992-1993, the supply of total credit significantly increased in the financial liberalisation environment. Even though financial deepening is able to sustain the economic growth, there is the accompanying price instability. The monetary target was

[2] Merican (1994) found that monetary growth (M3) was shown to be positively and highly correlated with inflation.

inappropriate as an intermediate target. Moreover, the large capital flows during that particular time followed by a reversal the following year led to very volatile growth of money supply. Thus, in order to overcome the limitations in monetary targeting, BNM had shifted its focus on interest rate targeting.

The shift in monetary policy strategy from monetary aggregates to interest rate policy as the intermediate target was precipitated by four main factors. These factors can be summarized as follows:

1. the liberalisation of interest rates since 1978, led to a more market-oriented interest rate determination process;
2. financial deregulation and liberalisation measures undertaken during the decade (in 1978) had enhanced the role of interest rate in the monetary transmission mechanism;
3. There was a notable shift in the financing pattern of the economy since the mid-1998 following structural changes in the economy from an interest-inelastic market (government securities market) to a more interest-sensitive market (bank credit and capital market); and
4. The investors had become increasingly more interest sensitive and thus BNM attached greater importance to interest rate targeting.

Basically, there are five combinations of monetary policy instruments that have been used by BNM in monitoring the interest rate performance. The instruments include the open market operations, direct intervention by BNM to borrow or lend in the inter bank money market, centralisation of the Federal

Government's surplus balances and the Employment Provident Fund with BNM, monitoring the statutory reserve requirement and as a last resort, BNM may use selective administrative measures. Although the interest rate policy has emerged as the primary policy stabilizing the price in the current environment, BNM still monitor very closely monetary aggregates, credit growth and other economics and monetary indicators including price developments, consumption and investment.

However, during the Asian financial crisis, BNM was unable to influence domestic interest rates that had been affected by the volatile short-term capital flows and the excessive volatility of the ringgit. BNM was not able to lower interest rates in order to prevent a further contractionary in the economy when there was a large capital outflows. This is due to higher interest rates offered in the offshore market to attract ringgit funds for speculation in the ringgit. This led BNM to introduce selective exchange controls on 1st September 1998. The following day, BNM fixed the ringgit exchange rate when the existing monetary policy was identified as the potential source of further instability in the exchange rate market. The aim was to eliminate the availability of offshore ringgit funds for speculative activities, and in the process, promote a stable ringgit exchange rate, prevent excessive flows of short-term capital and create a conducive environment for economic recovery.

In the case of Singapore, the responsibility of monitoring monetary policy lies with the Monetary Authority of Singapore (MAS) regulation. MAS was established under the Monetary Authority of Singapore Act of 1970, and started

operations on 1st January 1971. Before this, the various monetary functions normally associated with a central bank had been performed by several government departments and agencies.

As the central bank of Singapore, the primary objective of this organisation is to control low inflation as the sound basis for sustained economic growth. It is believed that, in an environment of low inflation or price stability, the prices of goods and services are not distorted by inflation. Thus, it can serve as clearer signals and guides to allocate resources more efficiently. In addition, such an environment is believed to encourage saving and investment as it prevents the value of assets from being eroded by unexpected inflation. Nevertheless the main functions of MAS fall into these four broad areas:

- Monetary and Exchange Rate policy: To formulate and execute monetary and exchange rate policies in order to promote sustained and non-inflationary growth of the economy;
- Banker and financial agent of the government: To manage the country's official foreign reserves and facilitate the issuance of Singapore Government Securities;
- Financial sector supervision: To foster a sound financial services sector. This includes supervising and regulating the banking, insurance, securities and futures industries; and
- Financial sector promotion: To develop and promote Singapore as an international financial center.

Unlike most other central banks around the world, one thing that MAS does not do is issuing currency. Instead, the task of issuing currency notes and coins is normally performed by the Board of Commissioners of Currency Singapore (BCCS). The BCCS was established shortly after independence in 1967, under the Currency Act.

Monetary policy in Singapore has focused on the exchange rate since 1981. The rational behind this particular monetary regime is because Singapore's small size and lack of natural resources have depended on imports for raw materials and exports to pay for these requirements. This has resulted in a very open trade policy, with very few import restrictions. As a matter of fact, out of every $1 spent in Singapore, 54 cents go to import[3].

Basically, the MAS has conducted the exchange rate policy by managing the Singapore dollar (S$) exchange rate against a trade weighted basket of currencies of Singapore's major trading partners and competitors. The basket is composed of currencies of those countries which are the main sources of imported CPI inflation and competition in export markets. The composition of the basket is regularly reviewed and revised to take into account any changes in Singapore's trade patterns. The intervention in the foreign exchange market from time to time is to prevent excessive fluctuations in the S$ exchange rate. The use of exchange rate policy, however, does not totally obviate the role of monetary policy. Regulation of the level of liquidity in the banking system alongside exchange

[3] According to the 1990 Input-Output Table published by the Department of Statistics Singapore.

policy is still needed by conducting money market operations in order to promote steady and non-inflationary growth.

Singapore is also a major offshore banking centre with obviously a high degree of capital mobility. Singapore's high saving rate has also encouraged diversification of asset holdings across country and currencies to spread risk. The openness of financial markets and the strong presence of multinational corporations have resulted in a high percentage of foreign liabilities and assets in the domestic banking system. All these factors have contributed to the accumulation of a large stock of private international cross-country asset holdings. As a result, small changes in the differential between domestic and foreign interest rates can lead to large and quick movements of funds. Domestic interest rates are largely determined by foreign interest rates and market expectations of the movement of the Singapore dollar exchange rate. There is no policy of controlling the money supply

Teh and Shanmugaratnam (1992) view this choice of monetary regime as based on the following assumptions:

1) Money supply adjusts passively to economic activity. Changes in money supply thus have a limited impact on economic activity, both in real and nominal terms;
2) A change in exchange rate has a major influence on inflation, and affects the international competitiveness of the real sectors; and

3) An exchange rate centred monetary regime in Singapore cannot co-exist with an independent policy on domestic money supply or interest rates; i.e., the active management of the exchange rate implies a loss of domestic monetary autonomy in the context of an open economy

The MAS also adopted other money market instruments for smoothing liquidity and controlling the excess supply of credit in the banking system besides foreign exchange swap or reverse swap operations. Other money market instruments consist of direct lending to or borrowing from banks, repurchase (repos) or reverse repurchase (reverse repos) agreements in Singapore Government Securities (SGS) and direct purchase or sale of SGS.

The use of financial variables as the monetary policy instruments depends extensively on the economic environment of each country. The exchange rate policy for example is more appropriately implemented as the major monetary policy in an open economy such as Singapore. Meanwhile, for the Malaysian economy the BNM is more interested in using a combination of monetary instruments that are ultimately capable of capturing the volatility in output performance. Table 1 provides a comparison of monetary policies implemented by the Malaysian and Singaporean authorities.