DYNAMICS RELATIONSHIP BETWEEN HOUSE PRICES AND MACROECONOMIC AGGREGATES

By
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ABSTRAK

Kajian ini mengkaji hubungan dinamik antara harga rumah dan pembolehubah makroekonomi. Terdapat kepercayaan umum bahawa pembolehubah makroekonomi seperti kadar inflasi, pengeluaran perindustrian, kadar bunga and penawaran wang (M2) adalah faktor-faktor penting bagi menpengaruhi prestasi harga rumah. Pasaran harta dan sektor pembinaan sebaliknya adalah satu penunjuk utama bagi pertumbuhan ekonomi. Model VAR bagi kointegrasi multivariate Johansen-Jeselius, Ujian penyebab Granger dan Model Vector Pembetulan-Ralat (VECM) telah digunakan untuk menguji hubungan dinamik antara pembolehubah-pembolehubah tersebut merangkumi dari tahun 1988:1 ke 2004:2. Dalam kajian ini, Indeks Harga Pengguna telah digunakan sebagai petunjuk kepada kadar inflasi. Prestasi sektor perindustrian dan kadar bunga pula diukur dengan Indeks Pengeluaran Perindustrian dan kadar pinjaman asas. Keputusan empirikal bagi kajian ini menunjukkan bahawa harga rumah dan pembolehubah makroekonomi mempunyai pergerakan bersama menuju ke titik keseimbangan pada jangka masa panjang. Pada jangka masa pendek, terdapat bukti bahawa wujudnya hubung-kait antara harga rumah dan pembolehubah makroekonomi. Prestasi bagi harga rumah menunjukkan reaksi yang berbeza-beza dari perubahan dalam pembolehubah makroekonomi. Penawaran wang (M2) dan Indeks Harga Pengguna pula muncul sebagai satu bidang yang paling kurang sensitif kepada perubahan tersebut. Oleh itu, kajian ini menunjukkan bahawa polisi pengurusan makroekonomi yang cekap akan menggalakkan prestasi harga rumah yang lebih baik di mana akan menolong mencapai pertumbuhan ekonomi yang pesat.

ABSTRACT

This study investigates the dynamic relationships amongst the house prices and macroeconomic variables. It is general belief that the macro variables such as inflation rates, industrial production, interest rates and money supply (M2) are some prominent factors to the performance of the house prices. The property market and construction sector are one of the leading indicators for the economic growth. The VAR model of Johansen-Jeselius multivariate cointegration test, multivariate Granger-causality test and also the Vector Error Correction Model (VECM) are applied to capture the dynamic linkages among those variables over the period of 1988:1 to 2004:2. in this study, the consumer price index is used to represent the inflation rates. The performance of industrial sector and interest rates on the other hand is measured by industrial production index and base lending rates. The empirical results of this study indicate that the house prices and macroeconomic variables are moving together towards its equilibrium path in the long-run. In the short-run, there are evidences of contemporaneous causality running between the variables. The results show that the general performance of the house prices is caused by the changes in industrial production and base lending rates. The house prices on the other hand, have shown different responses to the fluctuations in the macroeconomics variables. the house prices appear to be the least sensible to money supply (M2) and consumer price index. This study thus implies that an efficient management of macroeconomic policies will promote a better performance of house prices, which in turn helps to achieve a stronger and sustainable economic growth.

Chapter 1

INTRODUCTION

1.8 Background

The global economics slowdown particularly the United States (US) economy as well as the continuing weak performance of the Japanese economy, has had adverse impact on the Malaysian Economy. This has caused a drop in the real Gross Domestic Product (GDP) from 6.1 per cent in 1999 and 8.3 per cent in 2000 to 0.3 per cent in 2001 after two years of impressive growth following the 1997 Asian financial crisis (Malaysian Economic Outlook, 4th Quarter 2004). As shows in Table 1.1 and Figure 1.1, The Malaysian GDP growth reached 4.5 per cent in the 2003, up from 4.1 per cent in 2002. In 2003, the Malaysian GDP grew 5.2 per cent bringing 3 years average growth to 4.87 per cent. The solid growth of 6.0 per cent in 2004 was driven by the surge in external demand, combined with a robust pace in private consumption.

The Malaysian real GDP growth from 1997 to 2004 by sector is depicted in Table 1.2 and Figure 1.2. On the sectoral side, the manufacturing sector managed to secure an 8.3 per cent growth in 2003, despite the SARS epidemic, at a surprisingly faster pace than in 2002 (4.0%). The services sector was moderately affected by SARS, with growth slowing from 4.1 per cent in 2002 to 4.4 per cent in 2003. Firmer commodities prices had also induced higher production in palm oil and rubber. Growth in the mining sector was fuelled by higher petroleum and gas production. The contraction in the construction sector was due to less activity in the infrastructure and construction projects, as public spending was slashed and some projects were completed. The construction sector will

bounce back in the 2005 and will be making more contribution to GDP growth. However, activity in the housing sector was higher as demand for houses remained strong, especially with the incentives introduced in the Economic Package. Favourable financing conditions, such as low interest rates band make the loan packages offered by banking institution attractive. This will attract public interest to the housing sector both for new property as well as the secondary houses.

The housing sector is one of the important sectors of the Malaysian economy and it is one of the most highly regulated worldwide. Although the housing sector contributes only an average of approximately 1 per cent towards the country's GDP, it plays a significant role in sustaining the country's economic growth. There are numerous multiplier effects such as investment spending, government spending, consumer spending or exports. Not least of which is the housing sector. The fact is that housing sector supports over 800 upstream and downstream linkage industries who are responsible for some 80 per cent of the total real estate built (The Real Estate and Housing Developers' Association of Malaysia, 2004). The importance of the multiplier is that an increase in one of the components of aggregate demand will increase national income by more than the initial increase itself (AMSET, 1991). Therefore, if the government takes any action to increase expenditure by raising government current expenditure on construction sector or lowering interest rates to raise investment it will set off a general expansionary process and the eventual rise in national income and will exceed the initial increase in aggregate demand. Today, there are 100 public listed property companies compared to previously 80 during the 1998 in Malaysia Stock Exchange (MSE) formerly known as Kuala Lumpur Stock Exchange.

Figure 1.1 Malaysia: Real GDP Growth (1997 – 2004)

Table 1.1

Malaysia: Real GDP Growth (1997 – 2004)

Year	1997	1998	1999	2000	2001	2002	2003
Real GDP Growth (%)	7.5	-7.5	6.1	8.3	0.3	4.1	5.3

Year	2004	Q1	Q2	Q3	Q4
Real GDP Growth (%)	7.1	7.8	8.2	6.8	Na

Source: Malaysian Economic Outlook, 4th Quarter 2004

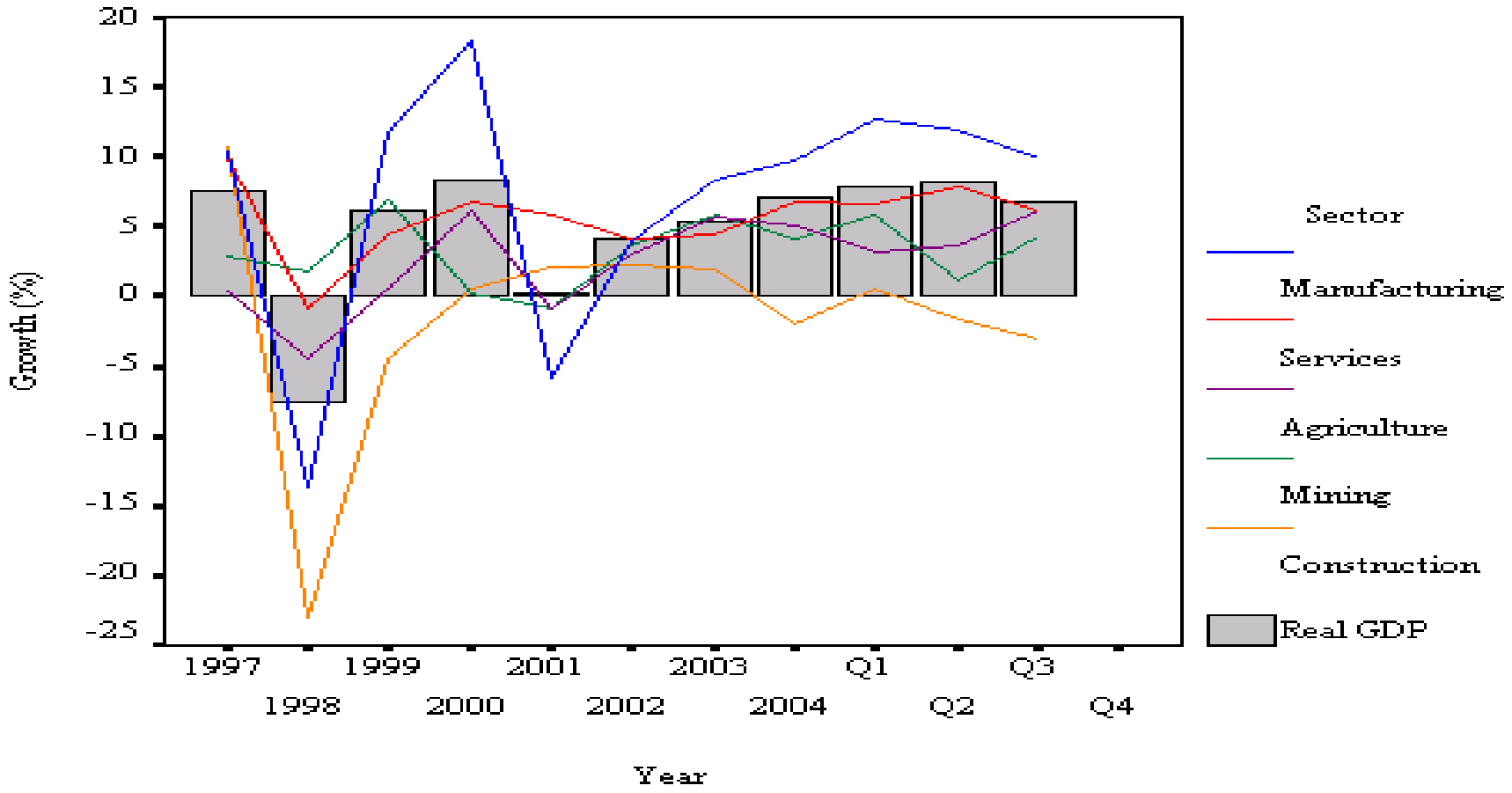

Figure 1.2 Malaysia: Real GDP Growth (1997 – 2004) by Sector

Table 1.2

Malaysia: Real GDP Growth (1997 – 2004) by Sector

Growth (%)	1997	1998	1999	2000	2001	2002	2003	2004	Q1	Q2	Q3	Q4
Real GDP	7.5	-7.5	6.1	8.3	0.3	4.1	5.3	7.1	7.8	8.2	6.8	Na
Manufacturing	10.4	-13.7	11.7	18.3	-5.8	4.0	8.3	9.8	12.7	11.9	9.9	Na
Services	9.9	-0.8	4.5	6.7	5.8	4.1	4.4	6.7	6.6	7.8	6.1	Na
Agriculture	0.4	-4.5	0.5	6.1	-0.9	3.0	5.7	5.0	3.2	3.6	6.1	Na
Mining	2.9	1.8	6.9	0.3	-0.8	3.7	5.9	4.1	5.8	1.2	4.2	Na
Construction	10.6	-23.0	-4.4	0.6	2.1	2.3	1.9	-1.9	0.6	-1.7	-3.0	Na

Source: Malaysian Economic Outlook, 4th Quarter 2004

Over the past few years the real estate industry has undergone drastic reform due to the liberalization of financial market, the drastic fall of interest rates, the obsolesce of the existing stock of houses and the change of consumer norms about housing uses. With the financial turbulence and stock market volatility, the housing sector, like many other sectors of the economy has been greatly affected. In addition, the housing sector has been a target of government fiscal and monetary policy aimed at achieving low inflation, unemployment and balanced growth (Tong, 1998). The housing sector for 2005 in generally will be determined on how well the country is able to cope with the recent downturn in the share, forex markets and the robust demand from China created an opportunity for local suppliers to manipulate the market. While several economic reports are optimistic about Malaysia's economic fundamentals, the region is heavily weighed down by unfavourable economic conditions prevailing in several neighbouring countries. The current illegal foreign workers repatriation will undoubtedly place additional strain on housing industry. However, too much speculation can and may create downside movements in the property sector.

1.1.1 An Overview: Malaysian Housing Market

House prices have all these years been the concern of the public, in particular, when the prices rose by leaps and bounds around early 1990, mid 1997 and early 2000. At one time housing developers were blamed for this phenomenon, and were called profiteers for the seemingly huge gains they made. The developers argued that uncertainty in obtaining planning approval, government red tapes, high holding costs and definitely economic fundamentals were the reasons for the high prices.

Housing boom of the early 1990s

In the early 1990s to 1996 Malaysia experienced a booming economy at unprecedented magnitude (Mat Zain, 2003). House price index soared and people were confident enough that prices would continue higher in order to borrow some of the profit locked into their properties. Figure 1.3 shows the extraordinary residential market economic performance achieved by Malaysian during the period of Sixth Malaysian Plan. As a Table 1.3 shows, overall the Malaysian House Price Index (IHRM) shows a consolidating market from 1990 to 1996. On the national level, there was a very slightly fall in percentage increase of prices for houses in Malaysia in 1996 but the price of houses were still increasing in Malaysia at a slightly lower rate in 1996 compared to previous year.

Housing bust of the 1997

In the mid 1997 to 1998 the Malaysian housing market experienced a severe slump as shown in Figure 1.4. High interest rates, rising unemployment and deep recession led to a sharp fall in demand for all types of housing and caused price to plummet in some areas. Compared to 1998, the Malaysian House Price Index (IHRM) dropped by 2.3% from 196.4 to 191.8 in 1999. Table 1.4 shows that price index remained negative for most of the 1998 and 1999. The residential property market remained weak in the 1999 though a slight recovery was detected during the period. Comparing the level of index in 1998 with the 1999, national housing market was on the road to recovery, showing either smaller decreases or increases in house prices. Several factors contributed

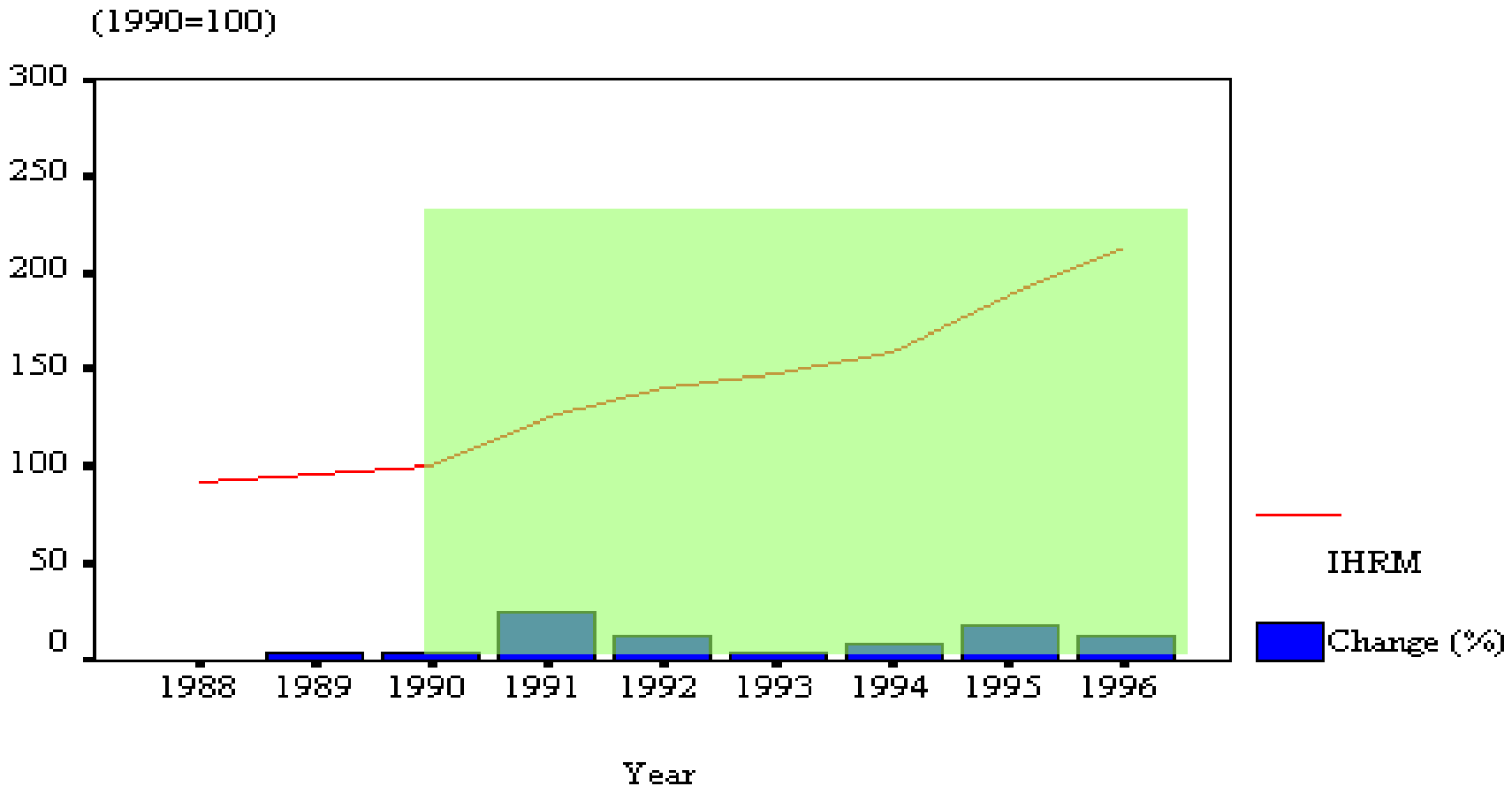

Figure 1.3 The Malaysian House Price Index (IHRM) (1988-1996): Housing Boom of the Early 1990s

Table 1.3

The Malaysian House Price Index (IHRM) (1988-1996): Housing Boom of the Early 1990s

Year	1988	1989	1990	1991	1992	1993	1994	1995	1996
IHRM	92.2	96.1	100	125.5	140.7	147.5	159.3	188.5	212.8
Change (%)	-	4.3	4.1	25.5	12.1	4.8	8.0	18.3	12.9

Source: The Malaysian House Price Index Bulletin, January-Jun 1997.

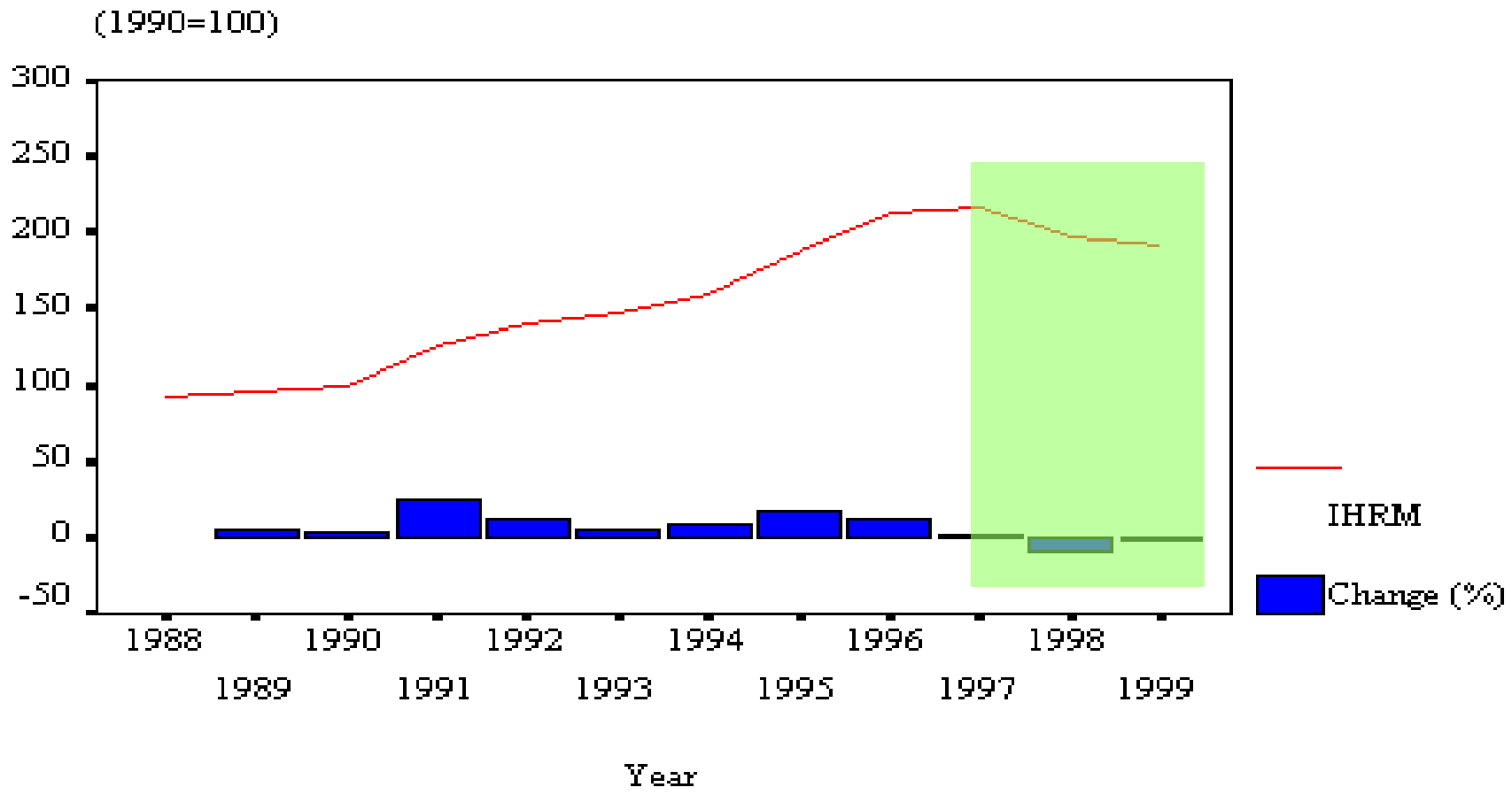

Figure 1.4 The Malaysian House Price Index (IHRM) (1988-1999)**:** Housing Bust of the 1997

Table 1.4

The Malaysian House Price Index (IHRM) (1988-1999): Housing Bust of the 1997

Year	1988	1989	1990	1991	1992	1993	1994	1995	1996
IHRM	92.2	96.1	100	125.5	140.7	147.5	159.3	188.5	212.8
Change (%)	-	4.3	4.1	25.5	12.1	4.8	8.0	18.3	12.9

Year	1997	1998	1999
IHRM	216.8	196.4	191.8
Change (%)	1.9	-9.4	-2.3

Source: The Malaysian House Price Index Bulletin, July-December 1999

to these early signs of market recovery including the lowering of interest rates, the increasing liquidity and the setting up of a special fund to provide developers with bridging finance for the construction of residential properties priced below RM150,000.

Housing recovery of the 2000s

Compared to 1998, the Malaysian House Price Index (IHRM) dropped by 2.3%, from 196.4 to 191.8 in 1999.The slight drop in the annual IHRM indicates that generally, residential property prices have remained at about the same level as last year. The slight drop of 2.3% in 1999 follows the larger drop of 9.4% in the annual IHRM in 1998. This shows that over the last two years, residential property prices have continued to drop, but the drop is bottoming out. Based on this trend, the IHRM for the year of 2000 is likely to show that residential property prices have recovered from the recent economic downturn. It was only following a sustained pick-up in Malaysian economic activity from 2000 onward that the housing sector enjoyed a significant return of housing demand as shown in Figure 1.5.

In conclusion, Table 1.5 indicates that the house price indices from 2000 to 2003 have clearly showed that the residential property market in Malaysia has recovered from the difficulties of mid 1997.

1.9 Problem Statement

The manner in which monetary policy is carried out is very important to determining the way in which economic stability and economic growth are achieved and maintained. Macroeconomic variables through which these policies are carried out in order to achieve

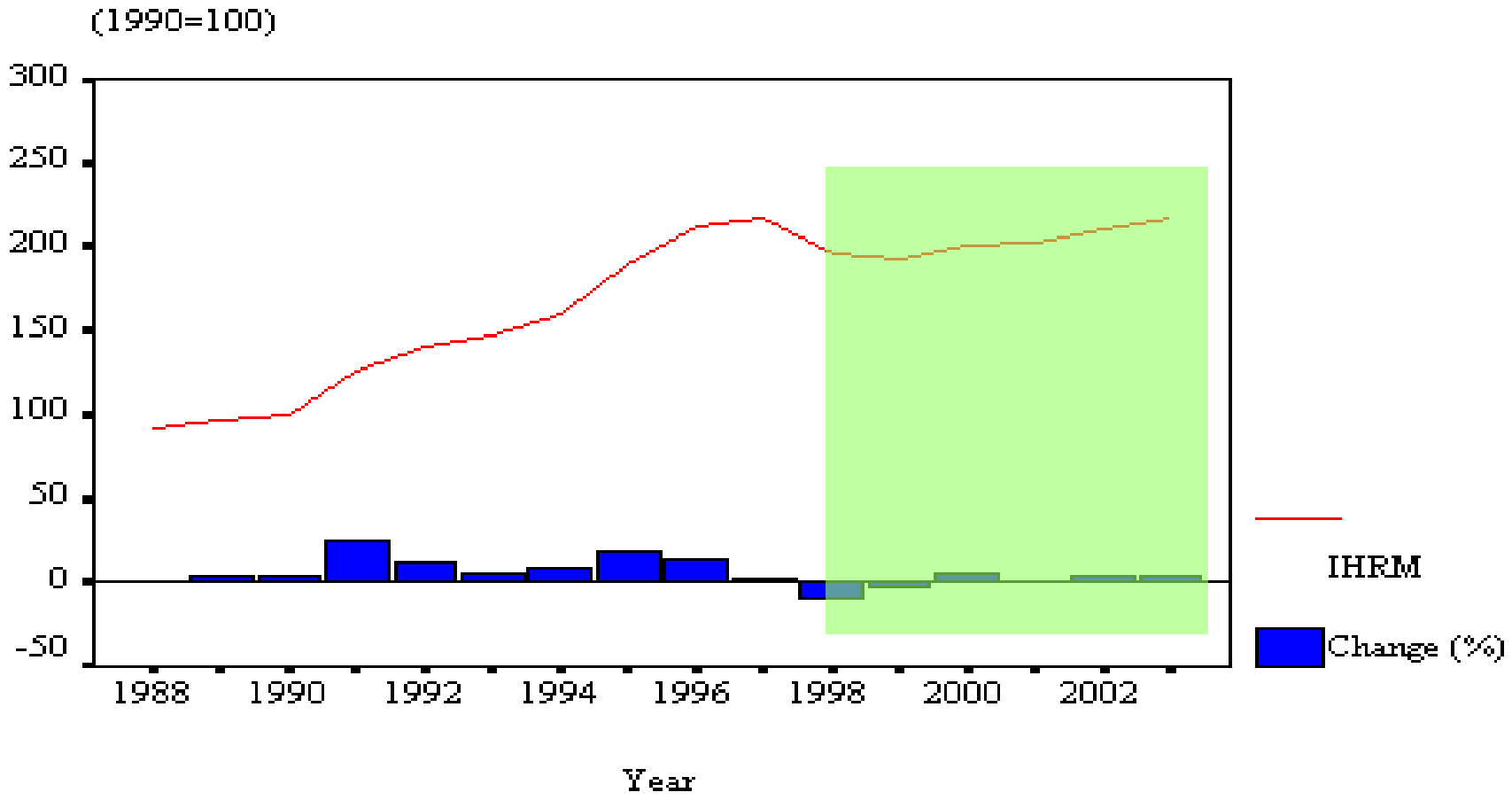

Figure 1.5 The Malaysian House Price Index (IHRM) (1988-2003): Housing Recovery of the 2000s

Table 1.5

The Malaysian House Price Index (IHRM) (1988-2003): Housing Recovery of the 2000s

Year	1988	1989	1990	1991	1992	1993	1994	1995	1996
IHRM	92.2	96.1	100	125.5	140.7	147.5	159.3	188.5	212.8
Change (%)	-	4.3	4.1	25.5	12.1	4.8	8.0	18.3	12.9

Year	1997	1998	1999	2000	2001	2002	2003
IHRM	216.8	196.4	191.8	200.8	202.02	210.0	217.1
Change (%)	1.9	-9.4	-2.3	4.7	0.69	3.85	3.38

Source: The Malaysian House Price Index Bulletin, July-December 2003.

the goals of monetary policies are doubled-edged sword. These macroeconomic variables such as house price index, consumer price index, industrial production index, base lending rates and money supply (M2) which include, among others, open-market operations, monetary pegged, Malaysian Plan and ASEAN Free Trade Area (AFTA) if used effectively could lead to the achievement of these goals desirably. But if one of all of them has not been used appropriately, the consequences in terms of unemployment, inflation, balance of payments problems and low rate of economic growth can imminently result.

The possibility of "bubble" in house prices has received considerable attention lately. To be sure, house price appreciation has been strong as a result of the recovery in the economy from the beginning of 2000. Even prices of residential property showed a healthy growth in 2004, the Malaysian annual house price inflation in 2004 was increase by 4.9 per cent as compared to 3.7 per cent in 2003 according to the Malaysian Property Market Report (2004). All houses price index was rose at 113.5 in the fourth quarter 2004, higher than 111.2 recorded in the corresponding quarter of 2003. Average prices of all houses in Malaysia increased to RM156,808 from RM153,580 in the quarter of 2003.

A key concern about a house price bubble is that gains in housing wealth either unrealized gains or gains extracted through the macroeconomic variables may be partly responsible for the relative strength in consumer spending. If a bubble exists, and its bursts, causing house prices to fall then an important prop for consumption would be gone. A house price bubble can be defined simply as deviation of the market price from the fundamental value of the house (Krainer, 2003).

1.2.1 The Effect of Macroeconomic Variables on House Prices

Krainer (2003), one important stylized fact of the housing market is that changes in house prices display strong persistence. It is widely thought that a lack of persistence is one of the hallmarks of an efficient market. It is not surprising then that persistence in house price changes is usually explained by appealing to the frictions in macroeconomic variables. Real estate markets do not clear immediately after a shock to the economy. It takes time for buyers and sellers of existing houses to search for each other. And it takes time for developers to bring new houses to market after an increase in demand and to work off inventories when demand weaken.

Changing housing market condition have been blamed for both the booming economy in the late eighties and the subsequent slump. The fact that economists both within government and outside predicted neither reflected basic lack of understanding of the underlying relationships and the role of the housing in the economy.

Housing affects the wider economy in several ways. Many empirical studies have shown that changes in the market value of housing wealth have a strong impact on consumers' expenditure. But the interaction between house prices and economy are more pervasive. House prices affected by macroeconomic variables and the overall growth rate of the economy. Central to all these interactions are between house prices and consumer price index; industrial production index; base lending rate; and money supply (M2).

1.2.1.1 Inflation

In recent years the economic of inflation and interest rates have come to occupy a central role in discussion of economic matters both the laymen and economists. Inflation is

always a monetary phenomenon everywhere. Although a great deal of attention was focused on the effect of inflation on good prices, money supply, unemployment and import prices, consumers do concern the impact of inflation on house prices. Consumers doubt whether there is a relationship between inflation and house prices. Consumers try to measure the responsiveness or sensitivity of the house prices to changes in the inflation rate.

1.2.1.2 Interest Rates

Interest rate is one of the instruments that control the economy and one of the factors that may affect the consumer mortgage loans and house prices (Zaiton, 1998). In theory there is an inverse relationship between interest rate and housing loan. When the interest rate is high the borrowing and investment will goes down and vice versa. The reason is that when the interest rate is high, the bank's base lending rate (BLR) is also high and as a result it may increase the cost of borrowing. Therefore the consumers and developer who rely on bank loan to invest in housing sector may incur a great cost and this will reduce their interest to invest in the housing market.

1.2.1.3 Money Supply

In developed countries, there is a strong relation between money supply and the price level (Bando, 1998). If the financial deepening and the depth of a money economy in ASEAN countries are developed to the same level as in developed countries, this research should be able to observe a relationship between money supply and house prices in

Malaysia that is similar to the one seen in developed countries. Thus, this study will observe the relationship of these two statistics both in short term and the long term.

Based on the above contention, this study attempts to provide more robust explanation of the behavior of macroeconomic variables to the house prices. Specifically, this study empirically uses the most recent econometric tools such as the Johansen cointegration tests and the vector error correction model to estimate the impact of the macroeconomic variables on house prices.

1.10 Research Objectives

In general, the objective of the study is to investigate the dynamic impact of the macroeconomic variables on the house prices of Malaysia. The consumer price index (CPI), industrial production index (IPI), base lending rates (BLR) and money supply (M2) will be used as the selected macroeconomic variables. The different of macroeconomic variables are expected to give different impact on house prices.

1.3.1 Specific Objectives

(1) To determine the existence of long-run relationship between selected macroeconomic variables and house prices.

(2) To identify the endogeneity of dependent and independent variable in the short-run relationship.

(3) To identify the important macroeconomic variables that could explain the changes of the house prices.

1.11 Research Questions

This study attempts to answer the following questions:

(1) Do change of inflation rates predict the house price?

(2) Do change of interest rates affected the house price?

(3) Do change of house price influenced by the money supply (M2)?

(4) Does the change of house price vary according to the CPI, IPI, BLR and money supply (M2)?

1.12 Significance of the Study

In general, the findings of this study would contribute to the existing findings and economics literature related to the issues of selected macroeconomic variables and disaggregated or sectoral economic growth.

The study of the relationship between house prices and macroeconomic variables such as the consumer price index (CPI), industrial production index (IPI), base lending rates (BLR) and money supply (M2) is worth studying. Understanding how well the theoretical model predicts house price reactions to these macroeconomic variables has several benefits and it is important revisions to policy makers.

This study also attempts to identify the appropriate macroeconomic variables that eventually have large explanatory power on house prices. These findings will be of benefit especially to the policy makers in improving housing sector performance in determining the best indicator to measure the housing price. Most obviously, to the extent that the model fits the facts, it can be used to stimulate the effects of alternative monetary policies on housing markets.

Finally, by using the Vector Error Correction Modeling (VECM), this study is able to capture the dynamic relationship between the macroeconomic variables (CPI, IPI, BLR and M2). With this improvement in econometric tools of analysis, the behavior of the variables can be identified either in long-run or short-run environment. Moreover, this technique also allows us to capture the direction of causality among variables.

As a result, it is hoped that this study will produce more evidence and provide better insights on the impact of consumer price index (CPI), industrial production index (IPI), base lending rates (BLR) and money supply (M2) on house prices. With such evidence, readers could use this study as supplementary information to economic knowledge. Perhaps this will enable them to interpret the information better, for future forecasting and thus assist them in making good decisions.

1.13 Definitions of Key Terms

This section seeks to provide and describe a basic but not an exhaustive overview of the key terms employed in the study. The purpose is to facilitate a general understanding of the study scope and function.

Anticipated inflation - Expectations about future price rises which households & firms use when planning economic decisions (http://www.tutor2u.net/glossary/advanced.asp)

Base Lending Rate (BLR) – A minimum interest rate calculated by financial institutions based on a formula which takes into account the institutions' cost of funds and other administrative costs. (http://www.tutor2u.net/glossary/advanced.asp)

Ceteris paribus – Ceteris paribus means all other things being equal. Economists recognize that many factors affect an economic variable. E.g. demand is influenced by the price of the good, income, taste, etc. To simplify and enable analysis, economists isolate the relationship between two variables by assuming ceteris paribus - i.e. that all other influencing factors are held constant (http://www.tutor2u.net/glossary/advanced.asp)

Consumer Price Index (CPI) – A measure of the overall cost of the goods and services bought by a typical consumer. The consumer price index is used to monitor changes in the cost of living over time (Mankiw, 2000)

Deflation - When the rate of inflation becomes negative. The general price level is falling and the value of money is increasing. Some countries have experienced deflation in recent years – good examples include Japan and China. In Japan, the root cause of deflation was very slow economic growth and a high level of spare (excess) capacity in many industries that was driving prices lower. (http://www.tutor2u.net/glossary/advanced.asp)

Demand – The quantity of a good or service that consumers are willing and able to buy at a given price in a given time period. Each of us has an individual demand for particular goods and services (http://www.tutor2u.net/glossary/advanced.asp)

Economic boom – A boom occurs when real national output is rising at a rate faster than the estimated trend rate of growth. In boom conditions, national output and employment are expanding and aggregate demand is high. Typically, businesses use a boom to raise their output and widen their profit margins by increasing prices for consumers (http://www.tutor2u.net/glossary/advanced.asp)

Economic growth – Economic growth is best defined as a long-term expansion of the productive potential of the economy. Sustained growth should lead higher real living standards and rising employment. Short term growth is measured by the annual % change in real national output (real GDP) (http://www.tutor2u.net/glossary/advanced.asp)

Economic recession – A recession means a fall in the level of real national output (i.e. a period when the rate of growth is negative) leading to a contraction in employment, incomes and profits. The last recession in Malaysia lasted from the mid of 1997 through to the 2000. When real GDP reaches a low point, the economy has reached the trough and with hope a recovery is imminent (http://www.tutor2u.net/glossary/advanced.asp)

Economic recovery - A recovery occurs when real national output picks up from the trough reached at the low point of the recession. The pace of recovery depends in part on how quickly AD starts to rise after the economic downturn. And, the extent to which producers raise output and rebuild their stock levels in anticipation of a rise in demand. The state of business confidence plays a key role here. Any recovery in production might be subdued if businesses anticipate that a recovery will be only temporary or weak in scale (http://www.tutor2u.net/glossary/advanced.asp)

GDP deflator – A measure of the price level calculated as the ratio of nominal GDP to real GDP times 100. Its reflects the prices of goods and services but not the quantities produced (Mankiw, 2000)

Gross Domestic Product (GDP) – Gross Domestic Product (GDP) measures the value of output produced within the domestic boundaries of the Malaysia over a given time period. GDP includes the output of the many foreign owned firms that are located in

the Malaysia following the high levels of foreign direct investment in the Malaysia economy over many years (http://www.tutor2u.net/glossary/advanced.asp)

House price inflation – The annual percentage change in house prices. There are two commonly quoted measures of house price inflation from the NAPIC (National Property Information Centre) and the Institut Penilaian Negara (INSPEN) (http://www.tutor2u.net/glossary/advanced.asp)

Hyperinflation – When hyperinflation occurs, the value of money becomes worthless and people lose all confidence in money both as a store of value and also as a medium of exchange. Recent examples include Argentina, Brazil, Georgia and Turkey (where inflation reached 70% in 1999). The classic example of hyperinflation was of course the rampant inflation in Weimar Germany between 1921 and 1923. (http://www.tutor2u.net/glossary/advanced.asp)

Inflation - Sustained rise in the general price level over time. The rate of inflation is the percentage change in a given price index over the last twelve months (http://www.tutor2u.net/glossary/advanced.asp)

Industrial Production Index (IPI) – An index covering production in mining, manufacturing, services, agriculture and construction, which are used as a main short-term economic indicator because of the impact that fluctuations in the level of industrial activity have on the remainder of the economy (Eurostat, 1996)

Interest rate – The price of credit or ration of the fee charged to secure credit from a lender to the amount borrowed usually expressed on an annual percentage basis (http://www.tutor2u.net/glossary/advanced.asp)