UNIVERSITI PUTRA MALAYSIA

**EMPIRICAL TEST OF MACROECONOMIC VARIABLES AND STOCK
MARKET RETURNS IN ASIAN EMERGING MARKET**

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There has been a number of documented evidence examining the relationship between macroeconomic variables and stock returns in developed countries. However, the effect of changes in macroeconomic variables on Asian stock markets is an interesting area to research with, therefore there is a need to address such issue in these developing countries.

This study attempts to investigate the relationships among stock prices, exchange rates, interest rates, trade balances, expected inflation, industrial production and money supply, by using data from six selected Asian countries namely Hong Kong, Singapore, Malaysia, Thailand, Philippines and Indonesia. The Multi index model (MIM) and the Error Correction Model (ECM) were applied to capture the dynamic relationship among these variables over the period of 1990-1 to 2000-4. The analysed were divided into two specifications –efficient market (Hong Kong, Singapore and Malaysia) and the less efficient market (Thailand, Philippines and Indonesia).

The empirical results of this study indicate that consistent with many studies in developed markets, stock prices and macroeconomic variables are integrated in the long run. However in the short run, the results are country specific. The general performance of Hong Kong market is caused by interest rates and money supply. For Singapore, the results showed that trade balances, interest rates and money supply were the factors for stock pricing. Interest rates, exchange rates and money supply appeared to be the factors influencing the stock price fluctuations in Malaysia. While for Philippines the results indicated that stock prices are affected by lag exchange rate, lag trades balances and lag interest rates. For Thailand the results found that expected inflation, exchange rate and interest rate were the factors for stock pricing. For Indonesia, the finding showed that interest rates and money supply were dominant factors in pricing stock returns.

Overall, for the efficient market the findings found that interest rates and money supplies appeared to be the major common factors affecting stock price fluctuations. However, in the less efficient market, the result indicated that interest rates were the only common factor affecting prices in Thailand, Philippines and Indonesia stock market.

The results documented in this study provide better insights on the relationship between stock markets and major economic variables in selected Asian countries. Such evidence, lead to better decisions for investors with cross border investments and to policy marker on how to adjust policies in order to minimize stock prices volatility subsequently improve market's performance. These findings raise several important implications for stabilizing the stock market. Firstly, the result appeared to suggest country specific macroeconomic variables influencing stock markets and secondly, there was one or two common macro economic variables influencing the Asian countries.

Abstrak thesis yang dikemukakan kepada Senat University Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

UJIAN KEATAS PEMBOLEHUBAH MAKROEKONOMI DAN PASARAN SAHAM DI PASARAN SAHAM ASIA

OLEH

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2001

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Terdapat beberapa kajian yang telah dijalankan untuk mengkaji pertalian di antara pembolehubah makroekonomi dan pulangan saham di negara- negara yang membangun. Bagaimana pun, kesan pembolehubah di atas pulangan saham di negara –negara yang sedang membangun merupakan satu kawasan kajian yang menarik, oleh itu perlu ada usaha untuk mengkaji isu ini di dalam negara-negara tersebut.

Kajian ini mencuba untuk mengkaji pertalian di antara pulangan saham, kadar pertukaran wang asing, kadar faedah, imbangan perdagangan, anggaran inflasi, kadar pengeluaran dan aggregat kewangan dengan menggunakan data dari enam buah negara yang terdiri daripada Hong Kong, Singapura, Malaysia, Thailand, Philippines dan Indonesia. Kajian ini menggunakan kaedah Multi index model (MIM) dan Error Correction Model (ECM) untuk mengkaji pertalian di antara pembolehubah-pembolehubah tersebut di dalam jangkamasa dari tahun 1990-1 hingga 2000-4. Kajian ini dibahagikan kepada dua kumpulan iaitu pasaran yang cekap (Hong Kong, Singapore dan Malaysia) dan pasaran yang kurang cekap (Thailand, Philipina dan Indonesia)

Keputusan empirik kajian ini merumuskan pasaran saham dan pembolehubah makroekonomi di setiap negara di dalam kajian ini adalah berhubung kait di dalam

jangkamasa yang panjang. Dalam jangkamasa pendek, keputusan menunjukkan, perkembangan saham di Hong Kong adalah dipengaruhi oleh kadar faedah dan aggregat kewangan. Di Singapore, keputusan menunjukkan imbangan perdagangan, kadar pertukaran wang asing dan aggregat kewangan merupakan faktor-faktor yang mempengaruhi harga saham. Kadar faedah, pertukaran wang asing dan aggregat kewangan merupakan faktor-faktor yang memberi kesan ke atas turun naiknya pasaran saham di Malaysia. Manakala keputusan untuk Philipina mendapati bahawa pasaran saham adalah dipengaruhi oleh lag kadar pertukaran wang asing, lag imbangan perdagangan dan lag kadar faedah. Bagi pasaran saham Thailand keputusan menunjukkan anggaran inflasi, pertukaran wang asing dan kadar faedah merupakan faktor yang mempengaruhi pasaran saham di negara tersebut. Untuk Indonesia, keputusan menunjukkan kadar faedah dan aggregat kewangan adalah faktor utama yang mempengaruhi harga pasaran saham.

Secara amnya kajian ini menunjukkan di pasaran yang cekap kadar faedah dan aggregate kewangan merupakan faktor penting yang mempengaruhi pasaran saham. Manakala di pasaran yang kurang cekap, keputusan menunjukkan hanya kadar faedah merupakan faktor penting yang mempengaruhi pasaran saham di Thailand, Philipina dan Indonesia.

Keputusan dari ujikaji ini memberi panduan penting tentang perhubungan diantara pasaran saham dan perubahan-perubahan utama yang dialami di dalam enam negara Asia yang dipilih. Keputusan ini boleh membantu pelabur membuat keputusan yang baik sebelum melabur di dalam negara-negara asing dan kepada penggubal polisi ia dapat membantu mereka membuat dasar-dasar polisi bagi mengurangkan kadar turun naiknya pasaran saham dan membaiki pertumbuhannya.

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TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

15

LIST OF ABBREVIATIONS

KLCI = KUALA LUMPUR COMPOSITE INDEX

BANGKOK = BANGKOK STOCK EXCHANGE OF THAILAND

HANGSENG = HANG SENG COMPOSITE INDEX

STIMES = STRAIT TIMES INDEX

PHLIPPINES = PHILIPPINES STOCK EXCHANGE

JAKARTA = JAKARTA STOCK EXCHANGE

ER = EXCHANGE RATE

EINF = EXPECTED INFLATIONS

TB = TRADE BALANCE

IPI = INDUSTRIAL PRODUCTION INDEX

INT = INTEREST

M2 = MONEY SUPPLY

CHAPTER 1

BACKGROUND OF STUDY

Introduction

The rationale for studying the relationship between financial and macroeconomic activity arises from both theoretical and empirical evidence which indicates that movements in financial asset prices are potentially important for understanding how the economy behaves. Failing to take account of the fact that extraordinary movements in financial asset prices have occurred from time to time in the past and can occur at any time in the future would therefore be a serious omission. Recent changes to the financial sector, particularly the economic crisis observed in Asian countries during 1997, has made the study of inter-relationship between financial market variability and macroeconomic variable more urgent in Asia market of different development stage.

There has been a substantial amount of work investigating the relationship between stock market returns and fundamental economic activities in the United States [see Aggarwal (1981); Fama (1970,1990)]. However, the economic role of the stock market performance in relatively less developed Asian countries is less clear as there is lack of studies has been done to see how do this less institutionally developed markets respond to changes in its macroeconomic variables, when compared to the well developed, well organised, and more efficient markets like the U.S. stock market. Since most of the studies were notably conducted in the American environment, hence not much can be said of the scope, extend and applicability of their findings to other context. Therefore, there is a need for similar

study in order to ascertain whether similar phenomenon also re-occurs in this less institutionally advanced economies.

This paper attempts to quantify various determinants of stock price for selected Asian countries namely Hong Kong, Singapore, Malaysia, Thailand, Indonesia and Philippines since 1990 to year 2000. We have chosen to study these Asian countries because of the amount of interest that is placed of these financial sectors recently. Moreover, each has a different income level, unique financial characteristics and various degrees of development. As such, in this study we separated these Asian countries into two specifications - efficient market comprises Hong Kong and Singapore and Malaysia, while the less efficient market comprises Thailand, Indonesia and Philippine. While it is well known that stock market is affected by external factors, this study attempts to quantify and compare their affects.

Recent time series techniques are employed, including unit roots testing, multivariate cointegration, error-correction modeling (ECM) and Multi Index Model (MIM). These techniques are useful to examine the dynamics interdependence of multi-countries stock markets both in short and long term period. The results obtained from this research will be of interest to international funds manager, policy makers and financial analysts whose interest are in the performance of these markets.

Economy and Development of Stock Exchange

Hong Kong

The Hong Kong Economy

Until July 1997 Hong Kong was a British colony. It consists of the Kowloon Peninsula, the New Territories, the business and residential area, and Hong Kong island where most of the financial and administrative faculties are concentrated, as well as over 200 tiny islands, mostly uninhabited.

With its strategic location at the doorway to the Mainland and on the international time zone that bridges the time gap between Asia and Europe, the Hong Kong Special Administrative Region (HKSAR) has been serving as a global centre for trade, finance, business and communications. Hong Kong is widely regarded as amongst the freest and most competitive economies in the world. The US Heritage Foundation ranks Hong Kong as the World's Free Economy for the sixth year in a row in 1999. The World Economy forum ranks Hong Kong as the third most competitive economy in the world.

Over the past two decades, Hong Kong economy has almost tripled, with GDP at an average annual rate about 5 percent in real terms. This outperformed the growth of the world economy as well as that of the Organisation for Economic Co-operation and Development (OECD) economies.

In 1996, Hong Kong's GDP was nearly $154 billion, easily outstripping that of, say, Great Britain. Its growth rate has hovered around 6% in recent years. The territory is in the world's top ten list of trading nations and is arguably the richest and most successful of the "Dragon" economies. It has almost no natural resources and can produce less than 20% of its own food; its principal natural asset is it magnificent harbour.

Services now make up about 75% of GDP, having long undertaken manufacturing as the engine of growth. The major components of Hong Kong's service sector are shipping, civil aviation, tourism, and financial services. Financial and business services include banking, insurance, real estate and a wide range of other professional services. Like Singapore, Hong Kong's strategic location and its excellent communication network and efficient infrastructure have made it a hub for trade, finance and business services in the region.

Singapore

The Singapore Economy

Singapore consists of one main island and 54 small ones at the southern tip of the Malay Peninsula. It has a highly educated population of only three million, who are predominantly south Chinese.

By the 1970s, Singapore had become one of the top industrial nations of the region; the trade generated by its port is the world's second largest. Economic growth in recent years

has averaged 10% and, like neighbouring countries, it is rapidly developing its information technology and banking sectors. In 1996 the OECD removed Singapore from its developing country list.

During 1996 per capita income in US dollar was about $28,000, second only to levels in Brunei, Kuwait and Japan. With over 1.53 million workers, its labour participation rate and a large foreign causal labor force, which in 1996 constituted about 18% of the total labor force. The economy grew at an average rate between 7.4% (1981-90) and 10.1% in 1994. Table1.1 provides further economic and social indicators in Singapore.

Inflation has been low under 3% and growth began to slow in 1995 to 8%, still remarkable by world standards. The steady appreciation of the Singapore dollar, which has kept the rice of imports low, has been Singapore's main tool for controlling inflation, though there are fears it is hurting Singapore's export competitiveness.

Manufacturing makes up 27% and financial/business services 29% of GDP. Within manufacturing, electronics is the most important industry. Singapore manufactures roughly half of the world's supply of computer disk drives, and exports significant volumes of other computer peripherals around the world.

Table 1.1 Basic Economic Indicators in Singapore

Indicators	1971-80	1981-90	1991-93	1994	1995	1996	1997	1998[a]
National accounts								
GDP growth (%)	9.074	7.360	8.000	10.051	8.755	8.000	7.500	1.5
Per Capita GDP (US$)	2717	8640	18208	25287	28526	31473	32468	29649
Private consumption/GDP	0.567	0.462	0.446	0.428	0.407	0.4224	0.5206	0.5400
Gov. Consumption/GDP	0.104	0.112	0.095	0.083	0.085	0.0996	0.1228	0.0996
Financial Indicators								
Gross domestic savings (% of GDP)	27.000	42.350	47.600	51.300	55.600	55.900	56.4	52.2
Gross Fixed Capital formation (% of GDP)	36.427	39.157	34.629	33.654	33.036	38.465	47.406	36.98
Inflation	6.714	2.286	2.663	3.050	1.794	1.32	2.0	-0.003
M2/GDP	0.614	0.770	0.910	0.868	0.845	0.8867	0.863	0.850
M3/GDP	0.676	0.946	1.124	1.054	1.029	1.083	1.161	1.260
Fiscal balance/GDP	0.011	0.031	0.122	0.160	0.144	0.144	0.095	-0.003
Current a/c balance /GDP	-0.130	0.001	0.105	0.161	0.177	0.1644	0.2146	0.182
Trade balance/GDP	-0.298	-0.129	-0.026	0.028	-0.003	-0.007	-0.014	0.172
Debt service ratio (% of GDP)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Social Indicators								
IMF Classification	Middle	Upper Middle	High	High	High	High	High	High
Literacy rate	-	-	-	-	-	98	98	98
Unemployment rate		3.420	2.433	2.600	2.700	3.0	2.4	4.6
Population growth	1.533	1.188	1.931	2.091	2.048	1.9	1.9	1.9

Note: a A mid-1999 estimate of GDP growth for 1999 is 6%

Sources: IMF, International Financial Statistics, May 1999; ADB, Asian Development Outlook, 1998; Government Finance Statistics Yearbook, 1985-1996.

The Development of the Singapore Stock Exchange (SSE)

The stock exchange in Singapore Ltd (SES) was incorporated on May 24, 1973, and began operation on June 4 on the same year after its split from the stock exchange of Malaysia, itself formed only after World War II. The SES was admitted to the International Federation of Stock Exchanges in Oct 1980. Being one of the major established stock markets in Asia, there are over 450 Singaporean, Malaysian and other international companies listed in Singapore Stock Exchange as of 1997.

Singapore has a reputation for the prudent and sound economic management. The fundamental objective of monetary policy is to promote sustained, non-inflationary growth of the economy. Being a small and open economy, monetary policy is targeted at the exchange rate. The strengthening of the Singapore dollar helps to reduce production costs since most of the raw materials are imported. Since 1990s, the strong Singapore dollar policy has effectively reduced the domestic inflation by curbing imported inflation.

Since its inauguration in 1971, the Monetary Authority of Singapore (MAS) has played a leading role in the development of the financial system. By enforcing high standards of risk controls, the MAS ensure that the financial system is prudent and professional. The stock exchange of Singapore has enjoyed healthy growth along with the economy of the nation. Between January 1975 and January 1995, The Singapore all share Index grew from 78.1 % to 50.9%, yielding a 9.8% compounded annual rate of return excluding dividends.

<center>**Malaysia**</center>

The Malaysian Economy

Malaysia borders Thailand in the Malay Peninsula and Indonesia on the large island of Borneo. It is populated by three main groups - the indigenous Malay groups (47%), Chinese, who dominate business life (32%) and Indians (8%). With a relatively small population (approximately 20 million) and very high literacy, the country was enjoying GDP growth of over 8% until the currency crisis. Its major markets re Singapore (20%), the US (18%), the EU 914%) and Japan (13%).

Malaysian has rich natural resources, is leading exporter of tin, rubber, palm oil and tropical hardwoods and has large reserves of petroleum and natural gas. The country is the world's top producer of natural rubber. Growth in the last few years has concentrated on a switch from agriculture to manufacturing. In 1996, GDP contribution from manufacturing was 34.3%, wholesale, retail trade and hotels, governments services, finance, insurance and real estate was 31.1%, agriculture, forestry and fishing was 12.4%, mining was 7% and construction 4.4%.

In 1981-82 world recession depressed the country's commodity exports and led to a serious increase in debt, from $4 billion in 1980 to $15 billion in 1984. In 1985 Malaysia plunged into a serious recession but was recovering by 1987. For the next three years, GDP growth was over 10% annually, resulting from a successful drive to increase exports of manufactured goods. Since then growth has dropped a little, to around 8%, but there