Financial Vulnerability Indicator in Malaysia: Construct and Forecasting Ability

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Financial Vulnerability Indicator in Malaysia: 
Construct and Forecasting Ability

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DECLARATION

I hereby declare that this research entitled “Financial Vulnerability Indicator in Malaysia: Construct and Forecasting Ability” is to the best of the author’s knowledge that of the author except where due reference is made. This thesis has not been accepted for any degree and is not concurrently submitted in candidature for any degree.

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Accomplishing a thesis requires plenty efforts and time. Along the way, a lot of people have contributed and assisted in completing this meaningful thesis for the degree of Doctor of Philosophy. Therefore, I would like to take this opportunity to express my deepest gratitude and appreciation.

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This study attempts to investigate the fluctuations of the Malaysian financial market through predicting the early signals of financial market vulnerability using the Financial Vulnerability Indicator (FVI) constructed through the signalling approach and the dynamic approximate factor model (DAFM), using monthly data spanning from 1997 to 2017. The indicators were constructed from macroeconomic, financial and property market data, which comprises of imports, the real GDP, exports, M2, total reserves, the share price, loans and advances, the consumer price index, housing approvals and the real effective exchange rate. The empirical results from the FVI based on the signals approach proposed by Kaminsky and Reinhart (1996) and Kaminsky and Reinhart (1999) suggested that weak exports, a decline in housing approvals, an overvaluation of the exchange rate and an economic slowdown are the common triggers of the occurrence of a financial crisis in Malaysia. For the FVI constructed through the DAFM, following Banbura and Modugno (2010, 2014) and van Roye (2014), the empirical findings indicated that imports, the real GDP and exports contained good predictive ability in gauging financial vulnerabilities. Both indicators highlighted the importance of internal and external macroeconomic environments in defining the financial vulnerability of an economy. In the evaluation of forecasting performance, the FVI constructed through the DAFM contained better predictive power, reflected by a lower noise-to-signal ratio. The feedback and amplification of the effects of financial vulnerabilities on the real sector were explored through the MSBVAR, methodology proposed by Sims et al. (2008). The outcome revealed that financial vulnerability shock brought about significant negative effects on industrial production and inflation while producing significant positive effects on the short-
term interest rate, KLIBOR, in a high-vulnerability regime. This highlighted the prominence of the nonlinearities during a high vulnerability period and this is consistent with studies on other economies. To conclude, this study highlighted the usefulness of composite indicators as an early warning mechanism to gauge vulnerabilities in the financial system from a macroeconomic perspective through a non-parametric and model-based indicator construction methodology while recognising the feedback effects of the real sector during periods of high vulnerability. Hence, policymakers and stakeholders in the financial market may improvise financial vulnerability indicators as early signalling mechanisms to foretell the developments in the financial market.

Keywords: Financial vulnerability, financial crises, signals approach, dynamic model.
Petunjuk Kerentanan Kewangan di Malaysia: Pembinaan dan Keupayaan Peramalan

**ABSTRAK**

oleh Sims et al. (2008). Hasilnya mendedahkan bahawa kejutan kerentanan kewangan membawa kesan negatif yang besar terhadap pengeluaran perindustrian dan inflasi di samping menghasilkan kesan positif yang besar terhadap kadar faedah jangka pendek KLIBOR dalam rejim kerentanan tinggi. Ini menonjolkan kepentingan fenomena tidak linear semasa tempoh kerentanan yang tinggi dan kajian ini adalah konsisten dengan kajian bagi ekonomi lain. Sebagai simpulan, kajian ini menonjolkan kegunaan petunjuk komposit sebagai mekanisme amaran awal dalam mengukur kerentanan dalam sistem kewangan dari perspektif makroekonomi melalui metodologi pembinaan petunjuk yang tidak berparameter dan berasaskan model sambil mengiktiraf kesan maklum balas sektor sebenar dalam tempoh kerentanan yang tinggi. Oleh itu, para pembuat dasar dan pihak berkepentingan di pasaran kewangan boleh menjadikan petunjuk kerentanan kewangan sebagai mekanisme penandaan awal untuk meramalkan perkembangan dalam pasaran kewangan.

Kata kunci: Kerentanan kewangan, krisis kewangan, pendekatan isyarat, modal dinamik.
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LIST OF ABBREVIATIONS

BNM  Bank Negara Malaysia
CGDP  Credit-to-Gross Domestic Product Ratio
CPI  Consumer Price Index
DAFM  Dynamic Approximate Factor Model
EX  Exports
FDI  Foreign Direct Investment
FVI  Financial Vulnerability Indicator
GDP  Gross Domestic Product
GNP  Gross National Product
HA  Housing Approvals
IM  Imports
IMF  International Monetary Fund
IT  Information Technology
KLSE  Kuala Lumpur Stock Exchange
LA  Loan and Advances
MHPI  Malaysian House Price Index
MSBVAR  Markov Switching Bayesian Vector Autoregressive
NEP  New Economic Policy
NTS  Noise-to-Signal Ratio
OPR  Overnight Policy Rate
REER  Real Effective Exchange Rate
RGDP  Real Gross Domestic Product
RPGT  Real Property Gain Tax
SP  Share Prices
TR  Total Reserve
UK  United Kingdom
US  United States
1.1 Introduction

Recent experiences in the global property market, caused by the 2008-2009’s Subprime Mortgage Crisis in the US, bear witness to increasing financial distress that in some way triggers the outbreak of a financial crisis. Manifestly, the recent Subprime Mortgage Crisis highlighted how a wavering property market, an upsurge in credit risk and rising asset prices could ultimately translate into financial instability. As with most economies, the property market in Malaysia could have an important impact on financial stability, for example China’s high leverage on property has raised concerns about its instability to the financial system, as Malaysian financial institutions withstand coverage of the domestic property market at RM733.4 billion, amounting to 25.7% of total financial assets in 2015. The magnitude of the booms and busts in the property market carry significant implications for the demand for credit by households and their debt serving capability, particularly, in situations where economic conditions are still tough for many and severely unaffordable property prices are likely to place a further strain on homeowners. In turn, this brings about higher loan default and massive property overhang. In the event of excessive debt accumulation by households and property developers, a sharp downward adjustment in house prices or a sudden slump in the economic fundamentals are both likely to disorder the balance sheets of banking institutions, resulting in the collapse of the financial market as experienced in the Subprime Mortgage Crisis.
For many years, policymakers and academics alike have discovered that the property market and financial stability are inextricably linked (Zhu, 2005). The impact of the property market’s interaction on credit spreads and bank solvencies have long been recognised as an important impetus to financial stability. Many economies have witnessed multiple episodes of a rapid upsurge in property prices that essentially mount financial stress. Among others, the Subprime Mortgage Crisis, popularly known as the ‘mortgage mess’ or ‘mortgage meltdown’ has evolved to offer valuable insights into the relationship between the property market and financial stability. It should be noted that the shock wave that emanated from the Asian Financial Crisis also warned of the tenacity of credit booms in the wake of huge private financial imprudence and household indebtedness, and the episode provided a salutary lesson to most developing Asian economies in the subsequent decade. In many respects, the painful lessons learnt over the past decade have evoked the boom-bust cycles of the property market as a mechanism for financial distress because the credit expansion in the aftermath of the real estate booms played a significant role in the run-up to past crises. In this regard, previous financial incidents have certainly increased the level of interest in the issues of financial stability since the current property market is underpinned by a wide demand-supply gap along with soaring property prices.

Since the occurrence of the Global Financial Crisis of 2008-2009, interest in early warning indicators has renewed, such indicators aim to assist in financial crisis forecasting by monitoring key variables. The G20 group of economies requested the International Monetary Fund (IMF) to conduct new early warning practices at the climax of the Global Financial Crisis in November 2008. In addition to that, the IMF was again requested as a result of the London Summit in April 2009 “to provide early warning of macroeconomic
and financial risks and the actions needed to address them.” These requests highlighted how vital leading indicators are in terms of predicting a country’s vulnerability to crises where previous episodes of financial crises would be useful in foretelling the future financial and economic outlook. Therefore, the construction of the financial vulnerability indicator (FVI) is essential for forecasting and determining the vulnerability of the financial market in a specific country and to avoid any detrimental circumstances that can be foreseen.

1.2 Malaysian Economy and Financial Market

Fluctuations in the financial and the real sector are closely intertwined where financial and credit conditions are the essential drivers of the economy. Moreover, financial and credit conditions are among the most significant contributors to the propagation of economic shocks. The severity of the Global Financial Crisis underlined that the financial sector has turned out to be inherently procyclical, capable of amplifying macroeconomic volatilities and business cycle fluctuations. During the periods of contraction of the business cycle, profitability falls as asset prices decline, credit conditions weaken, loan defaults upswing, and credit provision is tightened, infuriating the downturn. These pointed out the significance of the linkages and feedback that characterise the interaction between financial markets, the credit market, the property sector, and the real economy.

Similarly, fluctuations in the Malaysian financial and the real sector are closely intertwined and associated. The Malaysian financial sector is inherently procyclical,
correlated with the movements and performance of the economy. Since the country’s independence in 1957 through to 1970, development in Malaysia was driven by the market forces. Economic growth in Malaysia accelerated in moderation, recording an annual rate of 6 percent in the 1960s (Khan, 2002). This economic acceleration relied heavily on the export of a narrow range of primary commodities and government revenue was mainly generated through taxes on these commodities, namely, rubber, tin and palm oil, from Malaya and timber from the Borneo Territories. Although export earnings from tin and rubber affected the money supply, a prudent monetary policy maintained the commodity prices.

Since independence, Malaysia experienced its first economic boom due to high production and the value of its exported commodities in the international market between 1963 and 1964. Increasing demand from foreign manufacturing sectors, specifically, Japan and the United Kingdom (UK), ensured stable earnings from the exported supplies in the following years. Despite the stable export earnings, Malaysia still suffered from an over-reliance on export earnings as a source of funds as alternative sources of funds had not been strongly implemented.

Since the economic booming, commodity prices stabilised until an ethnic riot happened in May 1969 which left the Malaysian economy in uncertainty until 1971. Following the ethnic chaos in 1969, the government’s approach to development shifted radically in Malaysia and the New Economic Policy (NEP) was formulated at that time. The implementation of the NEP was intended to eradicate poverty and restructure the economic imbalances in Malaysian society. The NEP was introduced in the Second
Malaysia Plan (1971-1975) and designed to achieve the national objective of unity. The promulgation of the Second Malaysia Plan triggered an economic recovery in which a second boom occurred. Stoked up by the stability of commodity prices, urban migration and incremental enhancements in the purchasing power of the middle class, the public, finance and even business sectors expanded rapidly during this period. In 1971-1973, the government introduced a home ownership scheme for civil servants coupled with subsidised housing mortgages. These actions stimulated the confidence of property developers and owners throughout the country, who then commenced extensive housing developments.

After 1973, the property market in Malaysia continued to accelerate before a short recessionary spell in 1973 resulting from the spiralling of oil prices globally. The oil crisis happened at a time when Malaysia was at the start of a rapid economic expansion. The surge in oil prices and the consequent recession, especially in industrialised countries, affected Malaysia’s exports, which fell tremendously due to sluggish world demand. At the same time, the country also ‘virtually’ brought in inflation due to its imports reliance. As a result, the sluggish growth stunted the country’s economic development during 1973-1975. Growth in the gross national product (GNP) in 1974 of 8.4 percent fell to 2.2 percent in 1975 (Okposin & Cheng, 2000). Furthermore, by 1974, inflation had become a critical issue as oil prices outstripped the increases from other commodities while food prices nearly tripled compared with their level in the past three years.

Thereafter, property prices continued on an upward trend, which was attributed to the increased cost of labour and building materials. Several factors in the property market,
such as an overall supply shortage, a speculative market, favourable economic environments giving rise to effective borrowing and the acceptance of property as a medium of investment, contributed to the rising property prices. Strong growth in the construction industry between 1981 and 1983 was sustained mainly by the public sector’s expansion programmes in physical infrastructure and major policy transformations. The government’s policy on foreign direct investment (FDI) from the 1970s led to the existence of more free-trade zones. There was also a rapid development of oil installations and a continuing strong demand for housing. This led to the third boom in 1980-1983 where the average annual growth in the construction industry was 12.6 percent.

In the early 1980s, the economic recession in developed countries triggered by the United States’ high-interest rate policy resulted in an immense collapse in the international commodity trade. Most of the new industries at that time who were in the early phases of production suffered due to the economic collapse. Malaysia’s overall export price index waned by 30 percent and reflected a sharp decline in tin and palm oil prices between 1984 and 1986 (Athukorala, 2010). The unsustainable macroeconomic imbalance was mirrored by a sharp contraction in the economy where the growth rate registered negatively by 1 percent in 1985. On the business sector, corporate bankruptcies rose due to weak aggregate demand and the downturn also triggered a severe banking crisis, causing the non-performing loan ratio of commercial banks to hit 30 percent in 1987 and 1988.

To overcome the impact of the commodity crisis, the government undertook measures, which included the rationalisation of public development expenditure to increase growth in private investment, lightness in credit availability, higher costs of mortgage loans
and a provisional suspension on housing loans for public sector employees. The government stimulated private sector investment in low-cost housing and the revival of abandoned housing projects during the recession to further stimulate the economy and revitalise the construction industry. Following the amendments to the Investment Coordination Act and National Land Code in 1986, there was an influx of foreign investments in commercial and residential buildings. The economic recovery that followed was helped by an enhanced external sector and the adjustment efforts commenced by the government. These resulted in amplified investments and a recovery in construction demand as Malaysia benefitted from the foreign relocation of manufacturing bases by export-oriented firms in Japan, South Korea, Taiwan and Hong Kong during the late 1980s.

The early 1990s saw an ample amassing of outstanding domestic credit in the banking system, with heavy exposure to the property sector due to booming property prices between 1991 and 1996. This amplified exposure to the property market further deteriorated the banks’ financial positions as this lending led to a property oversupply in the country, reflected with a peak in the credit-to-GDP ratio of 167.2 percent in the last quarter of 1997 (Refer to Figure 1.1). In July 1997, the Thai currency depreciated sharply, causing an abrupt withdrawal of short-term capital out of the country. Vulnerable to speculative attack, this transmitted a wave of uncertainty and volatility in the foreign exchange and equity market, where it caused a dramatic fall in the exchange rate of the ringgit and pushed a sharp rise in interest rates. The Kuala Lumpur Stock Exchange (KLSE) index declined drastically from 1216 points in January 1997 to only 302 points in August 1998 (Nambiar, 2003).
As the rapid pulling out of short-term capital occurred, this led to a delay in major investment plans and risk accumulation in many businesses based on bankruptcies and non-performing loans. The downturn in the economy caused share and other asset prices to plunge severely, particularly, property prices due to the over-exposure of the property sector, driven by the speculative demand since the early 1990s. The breakdown in the financial sector impacted the real sector. By August 1998, the economy was in recession with shrinkage in output of 2.8 percent and 6.8 percent, respectively, in the first and second quarter (Athukorala, 2010). The unemployment and inflation rates increased tremendously, reaching 3.9 percent in 1998 and 6.3 percent in June 1998, respectively.

The combined effect of the economic collapse, property market crash and financial market breakdown was an enormous escalation in non-performing loans in the banking system. The Asian Financial Crisis was closely related to the vulnerabilities of short-term capital flows into the country’s economy and the abnormal activities of currency traders. In
September 1998, an exchange control measure was implemented and the financial sector was restructured extensively. As a result of the government’s further economic recovery measures, official government statistics showed that construction growth had increased by the end of 1999. The implementation of privatised projects and the expansion of government fiscal expenditure, particularly on infrastructure and residential developments, further supported the progression of the industry.

In the midst of recovering from the Asian Financial Crisis, the economy and particularly the stock market in the United States (US) were booming. During the dot-com boom, especially after 1996, the stock prices of Internet-based companies in the US shot up at a very fast pace. The dot-com boom resulted in the NASDAQ composite index increasing from about 600 points in 1996 to a peak of 5046.86 points during the year 2000. On March 13, 2000, the NASDAQ composite index dropped from 5038 points to 4879 points, which triggered a huge sell-off of information technology (IT) stocks. The NASDAQ stock index continued to plunge and the dot-com bubble in the US economy burst in 2001. As a result, interest rates were cut repeatedly to prevent any further meltdown while technology professionals were smashed with high unemployment.

The bursting of the dot-com bubble in the US triggered sell-off in the Malaysian financial market as well where the stock market index fell nearly 45 percent between February 2000 and April 2001. As Malaysia was one of the Asian economies that engaged in subordinate activities for dot-com companies in the US, the manufacturing sector was affected the most due to the low demand for electronic products following the bursting of the dot-com bubble, especially from the export markets of Europe and Japan. As a result, a
huge number of workers involved in manufacturing were suddenly out of work which caused Malaysia’s unemployment rate to shoot up. Eventually, these affected the Malaysian economy adversely where the real gross domestic product (GDP) growth negated with 1.2 percent in the third quarter of 2001. To enhance the Malaysian property market and other economic conditions, policy measures were introduced in Budget 2001 which included the lowering of the ceiling rate of the ad-valorem stamp duty on property transfers, increasing housing mortgage eligibility for public servants and encouraging the acquisition of second homes. Moreover, a fiscal stimulus package of RM3 billion in March 2001 and another of RM4.3 million in September 2001 were also executed to instigate private spending and to boost economic development.

Commencing in 2003, the demand for crude oil began to increase as Asian economies recovered from the Asian Financial Crisis and the bursting of the dot-com bubble in the US in late 2001. Furthermore, global oil production was struggling to accommodate the rapidly growing demand for oil from China and the US. From 2003 to 2005, China alone accounted for nearly 35 percent of global crude oil demand. In 2004, crude oil prices began to increase and even doubled from the price level in 2003. Due to continued worldwide economic progression, the global crude oil demand grew and the crude oil price rose above US$70 per barrel in 2006.

Even as an oil-exporting country, Malaysia still imports oil from other countries. Although revenue from the export of crude oil was profitable for Malaysia, the spike in oil prices pressured the overall price to a significantly higher level in the nation, which in turn brought about adverse effect to the economy. In 2003-2005, the impact of the oil price