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DO MACROECONOMIC VARIABLES INFLUENCE ON THE STOCK MARKET? A THEORETICAL REVIEW

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Abstract - The purpose of this study is to review how macroeconomic variables influence on the stock market. The study comprehensively reviews the finance theories and macroeconomic variables used by the past studies to investigate the nexus between the macroeconomic variables and the stock market. The study employs 61 studies, published in the journals, which were rated by the Australian Business of Deans Council (ABDC). As per the review, dividend discount model, arbitrage-pricing theory and the efficient market model are the commonly used finance theories by the selected literature. The review results further show that, selected past research have given more emphasis on domestic macroeconomic variables and a very poor attention on the international and global macroeconomic variables. Furthermore, as the impact of given macroeconomic variables on a given stock market, varies based on different time intervals and based on different econometrics techniques employed.

Index Terms - Stock market, macroeconomic variables, finance theories.

I. INTRODUCTION

According to the theory of economics, an economy is a system, which allocates scarce resources among competing ends of a particular society. Macroeconomic variables are indicators which signal the current trends in the economy, like, the gross domestic product, rate of employment, consumer price index, balance of pay-ments, broad money supply, lending interest rate, house hold consumption etc. (source: https://data.worldbankindicatormk.org/).

Stock market is an important segment in the financial system of any economy, as it facilitates the allocation of scarce resources, by channeling the funds through the surplus units to the deficit units. As a part of a widespread economic system, stocks markets inevitably exposed to these influences emerge within this system.

Over the past few decades, a large growing body of literature has investigated the influence of macroeconomic variables on the stock markets. However, a very poor attention has given towards the review of such literature. Therefore, this paper aims to fill that gap by conducting a comprehensive review on the carefully selected literature on this area. This study carries out a thorough literature review based on 61 studies, published in the journals, which were rated by the Australian Business of Deans Council (ABDC). The review comprises; the finance theories depict the nexus between the macroeconomic variables and the stock market and investigate macroeconomic variables and their effect to the stock market. This review will have important implications mainly for academic researchers.

II. LITERATURE REVIEW

Selected literature have been analysed under the two headings: Finance theories and Macroeconomic variables.

A. Finance Theories

This section provides a detailed discussion on finance theories, which explain the nexus between stock prices and macroeconomic variables as per the selected literature. Figure 1 depicts how each theory provides the theoretical background for the nexus between stock prices and macroeconomic variables.

1. Dividend Discount Model (DDM)

DDM (Miller and Modigliani, 1961) emphasizes the role of expected future dividends (or expected cash flows) and discount rate (or rate of return) in determining the current stock price. Change in any economic variable which influences expected cash flows and required rate of return will affect stock prices (Chen, Roll and Ross, 1986; Clare and Thomas, 1994; Khan et al., 2015). Previous studies (for example; Gjerde and Sættem, 1999; Morelli, 2002; Gunasekarage, Pisetasalasai and Power, 2004; Verma and Ozuna, 2005; Srivastava, 2010; Quadir, 2012) have highlighted the importance of DDM, in explaining the theoretical background of the nexus between stock prices and macroeconomic variables.

2. Efficient Market Hypothesis (EMH)

EMH (Fama, 1970) emphasizes the importance of available information in determining the share prices. Number of studies have attempted to examine market efficiency in respect to macroeconomic information (Gay, 2008; Kurov and Stan, 2018). Ibrahim (1999) concludes that Malaysian stock market is not informationally efficient with respect to consumer prices, credit aggregates and official reserves. Kurov and Stan (2018) report that S&P 500 is significantly responding to the macroeconomic announcement emerge from real activity (which includes GDP, unemployment rate, employment, personal
income, consumer credit), consumption (which includes new home sales), investment (which includes durable goods orders), government budget and prices (which includes producer price index).

B. Macroeconomic Variables
This section reviews the macroeconomic variables which have been investigated in previous studies and their corresponding impact on stock market under the three subheadings as: domestic macroeconomic variables, international macroeconomic variables and global macroeconomic variables.

1. Domestic Macroeconomic Variables
Past studies identify, the domestic macroeconomic variables as country specific macroeconomic variables (by Gjerde and Sættem, 1999), state macroeconomic variables (by Fama, 1981; Chen, Roll and Ross, 1986; Clare and Thomas, 1994), country factors (by Abogri, 2008) and as local factors (by Khan et al., 2015; Yang et al., 2018).

1.1 Domestic Interest Rate
Previous studies use a range of proxies for domestic interest rate for example; the term structure of interest rate (Chen, Roll and Ross, 1986; Clare and Thomas, 1994; Chen, 2009), 3-month treasury bill rate (Clare and Thomas, 1994; Khan et al., 2015), 12-month treasury bill rate (Hondroyiannis and Papapetrou, 2001), 90-day bank-accepted bill rate (Groeneveld and Fraser, 1997), 91-day certificate deposit rate (Yang et al., 2018), 3-month NIBOR rate (Gjerde and Sættem, 1999; Hooker, 2004), 6-month LIBOR rate (Snieka, Laskiene and Pekarskiena, 2008), Federal fund rate (Verma and Ozuna, 2005; Beltratti and Morana, 2006; Chen, 2009), policy interest rate (Abogri, 2008) and ten-year bond yield (Srivastava, 2010). Some researchers have used nominal interest rate (Osamwonyi and Evbuoya-osagie, 2012; Ozcan, 2012; Forson and Janratanagul, 2013; Bhargaeva, 2014; Geambašu et al., 2014) while others use the real interest rate (Gjerde and Sættem, 1999; Hooker, 2004; Hsing, 2011a, 2011b).

3. Arbitrage Pricing Theory (APT)
APT (Ross, 1976) assumes that the returns on the particular subset of assets under consideration are subjectively viewed by agents (or factors) in the market. A number of studies have been carried by employing APT to analyse the effect of macroeconomic variables on stock returns (or share price). Chen, Roll and Ross (1986) have developed a five-factor model including the macroeconomic factors; industrial production, expected inflation, unanticipated inflation, excess return of long-term corporate bonds over long-term government bonds and the excess return of long-term government bonds over T-bills. Clare and Thomas (1994) conclude that number of macroeconomic factors (such as oil prices, retail price index, UK private sector bank lending, current account balance) have been priced in the UK stock markets. Groeneveld and Fraser (1997) propose a multifactor model, which incorporates both local and global macroeconomic variables. Srivastava (2010) employs a multifactor model to identified macroeconomic factors (such as industrial production index, MSCI world equity index) which can explain pricing process of Indian stock market. Geambašu et al. (2014) in their study apply the APT on the Bucharest Stock Exchange and determined the macroeconomic factors with influence over shares’ return.

1.2 Domestic Inflation

Some researchers have used the general inflation rate of the economy to analyse the influence of the change in domestic price level on the stock market (Errunza and Hogan, 1998; Morelli, 2002; Hooker, 2004; Beltratti and Morana, 2006; Chen, 2009). On the other hand CPI or consumer price index is the most commonly used proxy for domestic inflation(Bilson, Brailsford and Hooper, 2001; Verma and Ozuna, 2005; Khan et al., 2015; Yang et al., 2018). Moreover, WSPI or whole sale price index (Srivastava, 2010), retail price index (Clare and Thomas, 1994) and the index of manufacturing prices (Groenewold and Fraser, 1997)have also been used as proxies for domestic inflation. Mukherjee and Naka(1995), Humpe and Macmillan(2009), Chinzar(2011), Hsing(2011a, 2011b), Kyereboah-coleman and Agyire-Tettey(2011) and Hsing and Hsieh(2012)find that domestic inflation has a significant negative influence on the stock market, but Clare and Thomas (1994), Wongbangpo and Sharma (2002) and Ratanapakorn and Sharma (2007) find a significant positive impact. Moreover, a short-run nexus between domestic inflation and the stock market was highlighted by Ibra-him(1999), Al-jafari, Salameh and Habbash(2011) and Yang et al. (2018) whilst Bhattacharai and Joshi(2009), Srivastava(2010), Ozcan(2012), Forson and Janrattanagul(2013) and Kotha and Sahu(2016) state a long-run relationship.


1.3 Domestic Output


1.4 Domestic Money Supply

As pre the literature, narrow money supply (M1) is the most common proxy of money supply(Clare and Tho-mas, 1994; Bilson, Brailsford and Hooper, 2001; Morelli, 2002; Verma and Ozuna, 2005; Beltratti and Morana, 2006; Chen, 2009). Other proxies are; M2
money supply (Liljeblom and Stenius, 1997; Flannery and Protopapadakis, 2002; Ibrahim and Aziz, 2003; Chanchart, Valadkhani and Havie, 2007; Hassan and Al refai, 2012), and M3 money supply (Groenewold and Fraser, 1997; Shabri Abd. Majid and Yusof, 2009; Chinzara, 2011; Kumari and Mahakud, 2014; Kotha and Sahu, 2016).


Furthermore, a bidirectional causality between domestic money supply and the stock market was reported by Wongbangpo and Sharma(2002) while an unidirectional causality from domestic money supply to the stock market was found by Tsoukalas(2003), Gunasekara, Pisetasalasai and Power(2004), Beltratti and Mora-n(2006), Brahmasrene and Jiranyakul(2007) and Ratnapakorn and Sharma(2007).

Unidirectional causality from stock market to domestic money supply (Al-jafari, Salameh and Habbash, 2011).


1.5 Other Domestic Macroeconomic Variables


III. INTERNATIONAL MACROECONOMIC VARIABLES

Past studies have used cross-country macroeconomic variables like exchange rate, inflation of a foreign coun-try (Verma and Ozuna, 2005), regional macroeconomic variables like regional trade and regional economic activity (Khan et al., 2015). In this study, "international macroeconomic variables" cover all the macroeconomic variables outside the local economy, but which are not recognised under the global macroeconomic variables.

3.1 ExchangeRate

Foreign currency exchange rate expresses a currency in terms of another currency. Previous studies have fre-quently used USD/Local Currency exchange rate(Bilsen, Brailsford and Hooper, 2001; Hooker, 2004; Khan et al., 2015; Yang et al., 2018). In addition to that Yan/Local Currency (Groenewold and Fraser, 1997), German Deutsch/Local Currency (Morelli, 2002) exchange rates were also found in literature. Some researchers use the real exchange rate (Shabri Abd. Majid and Yusof, 2009; Kyereboah-coleman and Agyire-Tettey. 2011) whilst others use the nominal exchange rate (Ibrahim, 1999; Tsoukalas, 2003; Verma and Ozuna, 2005; Snieśka, Laskiene and Pekarskiene, 2008). Clare and Thomas (1994), Hondo-yanni and Papapetrou (2001), Ratnapakorn and Sharma (2007), Chinza-r (2011) and Kyereboah-coleman and Agyire-Tettey (2011) find that exchange rate has a significant positive impact on the stock market. On the other hand Ibrahim and Aziz (2003), Verma and Ozuna (2005), Brahmasrene and Jiranyakul (2007), Abguri (2008), Gay (2008) and Hsing (2011a) report that as negatively significant.

Moreover, a short-run relationship between exchange rate and the stock market was found by Ibrahim (1999), Pilinkus and Boguslauskas (2009) and Al-jafari, Salameh and Habbash (2011) whilst, Kwon and Shin (1999), Ozcan (2012) and Kotha and Sahu (2016) find a long-run relationship.

Furthermore, a bidirectional causality between exchange rate and the stock market was reported by Wongbangpo and Sharma (2002) by Al-jafari, Salameh and Habbash (2011) whilst, Ibrahim (1999), Wongbangpo and Sharma (2002), Tsoukalas (2003) and Gan et al. (2006) report a unidirectional causality from exchange rate to the stock market.

However, Mukherjee and Naka (1995), Groenewold and Fraser (1997), Morelli (2002), Gunasekara,
3.2 Foreign Interest Rates

3.3 Foreign Stock Markets

3.4 Foreign Output
Khan et al. (2015) include the output of the region given the fact that a crisis occurring in one country may lead to a crisis in neighbouring countries, the economic weakness or instability of the region can affect the local economy as well as the stock market. Hussainey and Ngoc (2009) in their study investigate the impact of U.S. Industrial Production on Vietnam stock market and find a significant positive relationship. Khan et al. (2015) analyse the effect of regional GDP of South Asia on the stock markets in Bangladesh, India, Sri Lanka and Pakistan and found a significant relationship.

3.5 Foreign Inflation
Khan et al. (2015) include the inflation of the region given the fact that a crisis occurring in one country may lead to a crisis in neighbouring countries, the economic weakness or instability of the region can affect the local economy as well as the stock market. Verma and Ozuna (2005) in their comparative study investigate the impact of foreign countries’ inflation (of Argentina, Mexico, Brazil and Chile) on each stock market under the study. Khan et al. (2015) analyse the effect of regional CPI of South Asia on the stock markets in Bangladesh, India, Sri Lanka and Pakistan and found a significant relationship.

3.6 Other International Macroeconomic Variables

IV. GLOBAL MACROECONOMIC VARIABLES
In this review, “global macroeconomic variables” covers macroeconomic variables, which are common to the entire world. Bilson, Brailsford and Hooper (2001), Abugri (2008) and Khan et al. (2015) in their studies clearly recognize global economic variables.

4.1 Global Crude Oil Prices
Arabian Light crude oil (Gjerdet and Saettem, 1999) and Brent Crude Oil Price Index (Gunasekarage, Pisetasalasai and Power, 2004) are found in literature as proxies of global oil prices. Gay (2008) reports that global crude oil prices have a significant positive impact on the domestic stock market whilst, Brahmseene and Jiranyakul (2007) and Chanchart, Valadkhani and Havia (2007) report that as negatively significant. Moreover, Hassan and Al refai (2012) and Ozcan (2012) find a long-run nexus between global curd oil prices and the domestic stock market. However, Gunasekarage, Pisetasalasai and Power (2004) do not find any significant relationship.

4.2 Global Inflation
Khan et al. (2015) includes global inflation into his study as he expects an impact of that inflation on domestic inflation, exports, imports and thereon corporate profitability and stock prices. Gunasekarage, Pisetasalasai and Power (2004) and Khan et al. (2015) studies the impact of global
4.3 Global Stock Market
Previous studies have used MSCI World Index as a proxy of global stock market to investigate the nexus between the global stock market and the domestic stock market (Bilson, Brailsford and Hooper, 2001; Gunasekarage, Pisedtasalasi and Power, 2004; Hooker, 2004; Abugri, 2008; Srivastava, 2010; Khan et al., 2015). Some report a significant relationship (Bilson, Brailsford and Hooper, 2001; Abugri, 2008; Khan et al., 2015) whilst others find no significant relationship (Gunasekarage, Pisedtasalasi and Power, 2004; Hooker, 2004; Khan et al., 2015).

4.4 Global Output
Khan et al. (2015) includes global output into his study as he expects an impact of that output on domestic exports, imports and therefore corporate profitability and stock prices. Previous studies have used Industrial Production Index of the OECD (Gjerde and Sættem, 1999) world industrial production (Gunasekarage, Pisedtasalasi and Power, 2004) and world GDP (Khan et al., 2015) as the proxies of global output or production. Khan et al. (2015) found a significant relationship between the global output and the domestic stock market. However, Gjerde and Sættem (1999) and Gunasekarage, Pisedtasalasi and Power (2004) found it as insignificant.

CONCLUSION
The review of literature shows that a very little attention has been paid to research the impact of global macroeconomic variables compared to domestic macroeconomic variables on the stock market. Although some research has carried out to examine the impact of international macroeconomic variables on the stock market, very few number of international macroeconomic variables covered by such studies. Therefore, this research gap can be filled by including many new and unexamined international and global macroeconomic variables into the future studies. Moreover, as the impact of given macroeconomic variables on a given stock market varies based on different time intervals and based on different econometric techniques employed. Thus, there is enough room to carry out research work time to time in the same context to capture and understand such impact.

REFERENCES
Do Macroeconomic Variables Influence on the Stock Market? A Theoretical Review


