

THE IMPACT OF INDEX FUTURES TRADING
ON DAY - OF - THE - DEATH
AND SYSTEMATIC PRICE PATTERNS
ON THE
AMERICAN STOCK EXCHANGE

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الجامعة الإسلامية العالمية ماليزيا
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بِوَسِيْلَتِنِي اِسْتَلَامْتُ اَنْبَارًا اَيْجَسًا مِلْمِيْنَا

**THE IMPACT OF INDEX FUTURES TRADING
ON DAY-OF-THE -WEEK
AND SYSTEMATIC PRICE PATTERNS
ON THE
KUALA LUMPUR STOCK EXCHANGE**

By

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ABSTRACT

This paper investigates the impact of Stock Index Futures (SIF) trading on the Day-of-the-Week (Dow) effect and systematic price pattern on the Kuala Lumpur Stock Exchange. It also examines the impact of implementation of shorter settlement cycle on the Dow pattern of KLSE as well as SIF returns.

Using both regression based F-tests and pair-wise T-tests, the finding concludes that there is a Dow pattern in the KLSE but not in SIF returns. The KLSE Dow pattern although strong initially, seem to disappear (weaken) following the introduction of the SIF and shorter settlement cycle.

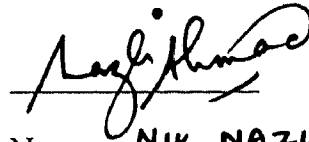
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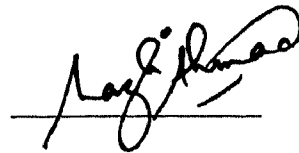
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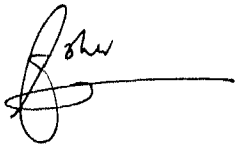
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I hereby declare that this research is the result of my own investigations, except where otherwise stated. Other sources are acknowledged by footnotes giving explicit references and a bibliography is appended.

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DEDICATION

I would like to dedicate this paper to my dear wife, Che Mahfuzah Abdullah, who is struggling to recover from a "stroke". I would like to thank her for her untiring support, love and for being there when I need her. I pray that she will get back to normal and be able read this dedication soon, InshaAllah.

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*“ Berburu ke padang datar,
dapat rusa belang di kaki,
berguru kepalang ajar,
ibarat bunga kembang tak jadi”*

My special thanks to Dr. Obiyathulla who supervised and taught me a lot on this project. I really appreciate the 'hands-on' learning. Thousands thanks to my MBA friend, Mohd Hanis for generously sharing with me his notes, ideas and encouragements during our MBA days. Lastly, for Kak Tipah, “terima kasih daun keladi” for helping me with her typing skills and ability.

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1. INTRODUCTION

Stock Index Futures (SIF) perhaps, were the most exciting innovation of financial markets in the 1980s. A SIF contract is basically an agreement between a seller and a buyer to respectively deliver and take delivery of a basket of shares, which makes up the index, at an agreed price at a specific future date. However, almost all SIF contracts provide for cash settlement in lieu of actual delivery of the basket of stocks due to the fact that delivery of a basket of stock is often a cumbersome exercise.

SIF is one of the most actively traded futures contracts in the world since it was first introduced in 1982 by the Kansas City Board of Trade. Currently, it is believed that the most active traded SIF in the world is the Standard and Poors (S&P 500) futures traded in the Chicago Mercantile Exchange (CME). It is interesting to note that some of the SIF contracts are listed on more than one trading platforms. Nikkei SIF contracts for instance, are traded on three different exchanges namely Osaka Securities Exchange (OSE), Singapore International Monetary Exchange (SIMEX) and the CME. Trading of SIF thrived successfully in other parts of the world, where they are traded on major financial centers and markets. The most popular SIF contracts apart from S&P 500 and Nikkei SIF, are FTSE 100 (Index of 100 British Stocks), Valueline Index (US Stocks), TOPIX (Index of 100 Japanese Stocks), Hang Seng Index (Index of 30 Hong Kong Stocks) and MMI – Major Market Index (20 US Stocks).

Surprisingly, trading volume of several SIF contracts has increased by several folds. The SIF trading volume has even surpassed the trading volume of the underlying cash market. The tremendous growth and popularity of SIF usage arises from the many advantages that SIF contracts could offer. The foremost advantage of SIF is diversification benefits. Diversification benefits arise from the fact that a SIF contract has as its underlying, an index which constitutes several stocks. Therefore, by purchasing a SIF contract, a futures player basically is buying each of the component stocks in the index. According to Portfolio Theory, investment in a large number of stocks reduces the unsystematic risk. Specifically, investment in a broad based SIF contracts like Nikkei 225, S&P 500 or KLSE Composite Index would mean that the investor is exposed only to systematic risk. Besides the diversification benefit, SIF also provides lower transaction cost. The transaction cost is cheaper in the sense that brokerage costs like commissions are relatively lower on a face value basis. The margins that need to be posted up front are much lower relative to full payment of stock purchase. These results in savings that reduce the cost of funds. Moreover, if we compare the transaction costs that will be incurred if we were to buy each of the index stocks, we will see that SIF is a lot more cheaper and accommodating.

A position in SIF contracts allows for exposure to the entire market, which is very broad and wide-ranging in nature. Such a broad based market exposure is very useful in managing portfolio internationally. This basically proves one important advantage of SIF that it provides the quickest way to gain exposure in any of the markets. In the absence of SIF, international fund managers would have to engage in individual stock selection to

accumulate a portfolio of a country desired stocks. Such a process can be time consuming, costly to undertake and cumbersome. Using SIF also can be useful to a local investor who intends to adopt a passive investment strategy. For example, the local investor who is long a SIF contract is essentially taking a long position in each of the constituents stocks that makes up the index. This strategy, albeit passive, proves to stand the test of time in the long run.

Malaysia introduced SIF contract based on its value weighted Kuala Lumpur Composite Index (KLCI) in mid December 1995. Designated as FKLI, the contract was designed and introduced by the Kuala Lumpur Options and Financial Futures Exchange (KLOFFE). This FKLI contract was Malaysia's first financial derivative, and probably Asia's only emerging market SIF contract. The introduction of this SIF contract was made possible by the legislative initiatives undertaken in 1993. These initiatives resulted in the Futures Industry Act, FIA (1993). It was designed to enable cash settlement and thereby trading of financial derivatives. The index futures contract experienced impressive growth in trading volume and open interest in its initial two years. The contract was popular with foreign fund managers who had exposure to the Malaysian Stock Market.

However, the imposition of capital controls has apparently stopped the desired growth in SIF contracts. The drastic measure of imposing capital controls regime effective 1 September 1998 took the stock investors as well as the SIF players by surprise. Among the measures undertaken were: (1) The requirement for approval for transfer of funds

between ringgit offshore accounts, (2) the requirement for approval for transfer to resident's accounts, (3) the use of foreign currencies for trade settlement, (4) the need to conduct all ringgit financial asset transactions through authorized depository institutions, (5) the imposition of maximum amount of RM 50,000 in foreign currencies that Malaysia travelers can take out of the country and (6) the imposition of the maximum amount of RM 1,000 (in ringgit) to be imported or exported out of the country. These requirements of the capital control effectively kept the foreign fund managers at bay and resulted in a sharp drop in SIF volume as well as open interest.

Advocates of the free market considered capital controls an impediment and going against the process of market liberalization. Capital controls, they argue, would cause investors to stay away from investing in the country and in the long run, would dry up foreign direct investment which is crucial in sustaining the growth of developing country like Malaysia. Arguments for the measure came from US economist Paul Krugman, who insists that such a measure would be fruitful if it is executed correctly. He further stresses that the capital controls has to be temporary because such measure is usually intended to buy time in order to achieve economic growth. More importantly, capital controls should not be undertaken to defend an over-valued currency but rather to aid and supplement economic reform. Whatever arguments put forth by the proponents or dissenters of capital control measures, it is evident that post implementation saw a substantial decline in the trading volume of SIF. Still, relative to other financial derivatives in Malaysia, SIF contracts are by far more popular.

Recently, an interest has emerged in investigating whether, and to what extent the day-of-the-week (*Dow*) pattern of underlying market is affected by introduction and trading of SIF contracts. Another interesting avenue worthy for investigation is whether, and to what extent the *Dow* effect is influenced by trading rule change, be it in settlement procedures or in trading system. But first and foremost, what exactly is a day-of-the-week (*Dow*) pattern? Basically believers of the *Dow* effect among the investing public and speculators believe that by looking at the day of the week they can somehow predict the performance of the KLSE. The belief is that if one executed his/her buying of stock on the first opening bell on Monday it is very likely that the stock will have a negative return by the closing bell on the same day. This is known as Monday negative intraday trading effect. Likewise, if one believes that he/she can earn superior return by buying any particular stock on opening bell on Friday and selling at the market close of the same day, basically he/she is a believer of Friday positive intraday trading effect. Alternatively, if the investor believes that he/she could earn superior returns by taking up the stock on Monday closing and disposing it on Tuesday opening, it essentially means that the investor is a believer of Tuesday positive overnight non-trading effect and would like to make profit from such phenomenon by doing the arbitrage.

These *Dow* effects can occur due to the fact that the market is weak efficient, such that time related anomalies are bound to occur. Many studies have found time related anomalies in stock market indices. Those studies observed the *Dow* effect, the weekend effect, the turn-of-the-month effect, the turn-of-the-year effect and the intraday patterns

to name a few. But for the purpose of this paper, we will be covering only the *Dow* and weekend effects.

This paper is organized as follows: Chapter 2 provides the motivation for study and research questions. Chapter 3 gives an overview of the existing literature related to our research questions. Chapter 4 describes our data and research methodology. Chapter 5 presents the organizational background of the KLSE, MDEX as well as KLOFFE. Chapter 6 provides the empirical results and evaluation. The final chapter, Chapter 7, concludes.

2. MOTIVATION FOR STUDY AND RESEARCH QUESTIONS

Despite the widespread usage of SIF internationally, it is often blamed and criticized for causing ‘gyrations’ and destabilizing the stock market. Introduction of SIF is argued to have resulted in higher volatility in stock markets. Those who argue for usage of SIF, on the contrary, believe that SIF is a required ingredient towards creating a ‘complete’ financial market. Our objective among others is to examine the key issues related to introduction and trading of SIF contracts. We are also interested to see whether or not the day-of-the-week (*Dow*) pattern really exists in Malaysian Stock Market as well as in the SIF Market. Addressing these issues is of paramount importance, as it will provide useful insights for future policy making. Though there has been quite of number of studies investigating the *Dow* effect and other seasonal anomalies in Malaysian stock market, there appears to be no in depth study on whether the SIF market has a similar *Dow* pattern. Further, whether each of these markets influence each other from a *Dow* viewpoint would be interesting to explore.

Given the research motivation, this paper studies three broad areas related to *Dow* pattern and stock index futures. The three areas being:

- a) Systematic patterns in daily Stock Market/Cash Market and SIF returns.
- b) Impact of SIF trading on the *Dow* pattern of the KLSE.
- c) Impact of change in trading rule on the *Dow* pattern of the KLSE and SIF.

Basically, we use four data sets. First, a set of the KLSE daily data from early January 1990 to end December 2001 and second, a set of FKLI first spot month daily data for the same period. The third and fourth data sets are sets of daily data for the KLSE and FKLI first spot month for the period of 20 December 1999 to 19 December 2001. The first data set is used to address the systematic patterns in daily cash market and SIF returns as well as the impact of SIF trading. The third and fourth data sets are used to study the impact of trading rule change on such pattern in the KLSE and SIF returns.

In order to examine these three broad areas, we address a total of five research questions.

These research questions being;

- (1) Is there any evidence of day-of-the-week (*Dow*) pattern in the Malaysian Stock Market?
- (2) Has this pattern been affected by introduction of SIF?
- (3) Is there any evidence of a *Dow* pattern in SIF returns?
- (4) Is there any difference in the *Dow* pattern between the KLSE Composite Index (KLCI) and SIF returns?
- (5) What is the impact of trading rule change from T+5 to T+3 in the KLSE on the *Dow* pattern of KLCI and SIF returns?

3. LITERATURE REVIEW

This chapter provides an overview of existing literature relevant to our research questions. This review of earlier studies is organized sequentially in the order of aforementioned five questions.

3.1 The *Dow* Pattern of Underlying Cash Market

There are voluminous studies documented the *Dow* effect especially in the case of the United States (US), United Kingdom (UK), Japan and Hong Kong. Cross (1970) examined the daily return of S&P 500 from 1953 to 1970 and found that the mean return on Fridays was significantly positive, whereas the mean return on Mondays was significantly negative. French (1980) replicated the study and extended the analysis of daily S&P Composite Index returns for the period of 1953 to 1978 and found the mean Monday returns to be significantly negative and mean other days of the week returns to be positive with Wednesdays and Fridays having the positive and the highest returns. Cross (1970) and French (1980) used daily close to close (*CTC*) price which suggested that they might have not discriminated the *Dow* effect in trading period from non trading period in US market.

Rogalski (1984) is the first author who gave a new dimension on defining the *Dow* returns. He specifically defined Monday returns as occurring between Monday's open and close rather than since Friday's close. The returns that occurs between the Friday

opening and Monday close is essentially the weekend effect. In that particular study, he used both daily S&P 500 Composite Index and Dow Jones Industrial Average (DJIA) Open to Close (*OTC*) price found that Monday *OTC* returns to be insignificant. Using Close to Open (*CTO*) price, Rogalski (1984) however obtained a significant negative Mondays mean returns. The negative Monday *CTO* mean returns basically reveals that it is exactly the weekend returns has the negative effect. Based on these findings, there appears to be a consensus of the preponderance of negative weekend and positive Friday effect in the US market.

There are also quite a number of studies examining the weekend effect. Gibbons and Hess (1981) investigated the weekend effect in the DJIA using *CTO* daily prices from 1962 and 1978. They documented the presence of negative weekend returns. Laksnishok and Levi (1982), Keim and Stambaugh (1984) and Smirlock and Starks (1986) are among the literature that covered the *Dow* and the weekend effects in US. They all reported negative Monday or weekend effect and positive Friday effect in the US stock market.

Investigation of the *Dow* and the weekend effects outside the US seems to yield mixed results. Condoyanni, O'Hanlon and Ward (1987), examined both *Dow* and weekend effects in Australia, Canada, France, Japan, Singapore, France, UK and US. They reported negative weekend effect for UK and US, and negative Monday returns for Canada and France. Like previous studies, Condoyanni et. al. (1987) did not find negative effect on Monday trading period returns using *OTC* measure for the US.

Board and Sutcliffe (1988) examined the existence of the *Dow* and the weekend effects in the UK market for the period 1962 to 1986. Their findings on the Financial Times All Share Index revealed that investment in the UK stock market would yield lower return on Monday than other days of the week. Their observations are essentially similar to that of French (1980). They further stressed that settlement procedures provide only partial explanation for results.

For the Malaysian Market, there are a few studies specifically investigating the *Dow* effect on the KLSE. Annuar and Shamsheer (1987) are among the pioneers who examined the existence of the *Dow* pattern using daily data from the News Straits Times Industrial Index from the period of July 1975 to end December 1985. Using both F and pair-wise t-tests, they found that both Mondays and Tuesdays returns are significantly negative on the KLSE. They also reported that Fridays return is usually being positive and being the highest.

Wong, Hin and Chan (1992) alternatively, investigated the widely pronounced *Dow* effect in the KLSE by using a different benchmark. Instead of using the popular KLSE Composite Index, they used the KLSE Industrial and Commercial Index for the period 1975 – 1988. Employing the non-parametric Mann-Whitney test, they documented that Monday and Tuesday results are significantly different from other days of the week.

Interestingly, Omar Marashdeh (1994) rejected the widely accepted negative Monday effect proposition in the Malaysian Stock Market. Using a regression based approach; he investigated the *Dow* effect in four Asian-Pacific stock markets namely Malaysia, Australia, Japan and Hong Kong. As for the KLSE, daily closing data of 2½ year period beginning January 1990 to July 1992 was used. He found no significant *Dow* effect in the Malaysian stock market. Albeit conflicting observations recorded by both Omar Marashdeh (1994) and Annuar and Shamsheer (1987), Mansor Hj. Ibrahim (1997) stressed that such discrepancies were nothing peculiar given different time window used in the study. Mansor further suggested that the peculiarity is to be expected because Annuar and Shamsheer (1987) were using a 10 year data whereas Omar Marashdeh was using only a 2 ½ year data.

Othman Yong (1995) is another researcher who rejected the conclusion drawn in Omar Marashdeh (1994) study. While studying the influence of end of week performance of the New York Stock Exchange and the Tokyo Stock Exchange on the beginning-of-the-week performance of the KLSE, he did observe systematic patterns on the KLSE. He recorded, contrary to the Omar findings, that for the period of 1983 to 1990, there is definitely a significant negative Monday returns or weekend effect in the KLSE.

A further study on the KLSE by Davidson and Peker (1996) yielded another interesting result. They examined the *Dow* and the weekend effects for the period of 1986-1993 using robust empirical techniques popularized by Connolly (1989). They pointed out that earlier studies conducted by Annuar and Shamsheer (1987) and Othman Yong (1995)

suffered from deficiencies which were specifically mentioned by Connolly (1989). They argued further that for the *Dow* effect to be proven accurately, a time varying volatility model such as robust empirical technique should be used as a methodology. In view of that, they concluded that negative Monday returns are not significantly present in the data.

Mansor Hj. Ibrahim (1997) examined the *Dow* pattern in the KLSE using KLCI daily closing price from January 1980 to end December 1996. Employing a regression based approach, he reported the presence of the *Dow* effect, in particular, negative Monday returns in Malaysian Stock Market. He added substance to his study by examining the twist on Monday effect, a proposition brought forward by Jaffe, Wasterfield and Ma (1989). He documented that on the KLSE, Monday returns are significantly negative when the previous week's returns are negative and Monday returns are significantly positive when the previous week returns are positive.

Kok Kim Lian (1999) investigated the *Dow* effect in Asia Pacific Stock Markets using ordinary least square (OLS) regression and GARCH modeling. He reported that the *Dow* effect, in particular negative Monday effect is present in smaller markets of Malaysia and Singapore. Later on, Foo and Kok (2001) extended the analysis on the KLSE Second Board and reported almost similar findings on Malaysian Second Board Companies.