Elections and financial markets puzzle: Malaysian evidence

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Received 25 April 2022
Revised 2 June 2022
16 September 2022
Accepted 22 September 2022

Abstract

Purpose – This paper aims to explore the election cycle and financial markets puzzle in a unique emerging market like Malaysia.

Design/methodology/approach – By employing an event-study methodology and wavelet analyses, the author tests for uncertain information hypothesis by examining the reactions of the Kuala Lumpur Composite Index (KLCI) and ringgit surrounding Malaysian general elections, spanning from GE5 (1978) to GE14 (2018). This paper also explores the relationship between KLCI and ringgit.

Findings – While the author does not find support for the uncertain information hypothesis, the author uncovers that KLCI tends to overreact following elections, regardless of the winning coalition. The author also records no relationship between KLCI and ringgit in the short run, but the author observes that ringgit leads KLCI in the long run.

Practical implications – The study's findings bear implications for investors' disposition in the Malaysian equity market. Investors should square off their positions before the general elections to avoid equity market overreactions and potential losses.

Originality/value – Before Malaysia GE14 (2018) general election, Barisan Nasional carried the reputation as one of the longest-serving ruling coalitions in the world since Malaya independence in 1957. However, the ruling coalition was voted out in GE14 (2018), and the Malaysian equity has since dropped.

Keywords National elections, Stock market, Ringgit, Malaysia, Event-study, Wavelet

Paper type Research paper

1. Introduction

The Malaysian ruling coalition known as Parti Perikatan or Barisan Nasional was one of the longest-serving ruling coalitions in the world, alongside the Workers' Party of North Korea (since 1948) and the Communist Party of China (since 1949) [1]. Barisan Nasional had had an uninterrupted reign in the Malaysian political arena since Malaya had gained independence in 1957. However, in the 14th Malaysian national (or general) election in 2018, referred to as GE14 (2018), the unexpected took place: David finally defeated Goliath–the ruling coalition was suddenly voted out of power [2]. The opposition coalition Pakatan Harapan's victory was heralded by many as a new dawn for Malaysia. Yet, the Malaysian equity market index, the Kuala Lumpur Composite Index (KLCI), dropped from 1846.51 on 8 May 2018 to 1778.32 on 8 June 2018 and sank further to 1663.86 on 6 July 2018. The change of regime appeared to have scared investors, resulting in negative abnormal returns for the KLCI. Such a change in political power, according to Pantzalis *et al.* (2000), would have resulted in higher uncertainty as information about the policies of the newly formed government would have been scarce. We are particularly motivated to examine the impact of elections on Malaysian equity (KLCI) and currency (ringgit) markets as Malaysia has an exceptional election history. A newly formed government overthrowing a 61-year

JEL Classification — G14, G15

The authors thank Don Johnson (the editor) and two anonymous reviewers for their insightful comments on earlier version of this paper. The authors are extremely grateful to Ammar Faris for helping us with research support. This work was supported by the Kulliyyah of Economics and Management Sciences [DEBA 1-0017]. The authors are very thankful to DeBA KENMS, IIUM for granting the research funds.

Managerial Finance
© Emerald Publishing Limited
0307-4358
DOI 10.1108/MF-04-2022-0185

rule of a ruling coalition may signal political instability, thus implying a higher country risk and potential adverse impact on direct foreign investment (Hayakawa *et al.*, 2013). The change in government may have rattled investors in Malaysian financial markets, which, in our view, is very unique, and demands a thorough empirical investigation.

Academic scholars and finance practitioners have long been puzzled by the impacts of political elections on financial markets. Elections are expected to move financial markets because investors and traders would incorporate their outlook of politically endorsed policy on stock prices and sovereign bonds (Eichler and Plaga, 2020). Every democratic country in the world conducts national elections every four or five years. As elections unveil the winning coalition, financial markets would react either positively or negatively. Since the 1970s, a substantial amount of literature has discussed the relationship between elections and financial markets behaviour. One strand of election research argues that there is a relationship between US presidential cycles and the US stock market (see Goodell and Bodey, 2012; He *et al.*, 2009; Hensel and Ziemba, 1995; Jayachandran, 2006; Johnson *et al.*, 1999; Knight, 2006; Niederhoffer *et al.*, 1970; Nippani and Arize, 2005; Nippani and Medlin, 2002; Riley and Luksetich, 1980; Santa-Clara and Valkanov, 2003; Steeley, 2003). Another strand deriving from more recent studies contends that neither the election cycle nor election results can predict stock market returns (see Jones and Banning, 2009; Powell *et al.*, 2007; Sy and Al Zaman, 2011).

For an emerging market like Malaysia, two theories could explain the connection between elections and financial markets. The first theory is the uncertain information hypothesis by Brown *et al.* (1988), which predicts that investors require higher returns from taking additional risks when significant unanticipated information arrives. The second theory is De Bondt and Thaler's (1985) proposition that most people would overreact to surprising news and sensational events. We test Brown *et al.*'s (1988) uncertain hypothesis by examining the Malaysian equity market index, also known as Kuala Lumpur Composite Index (KLCI), Malaysian currency (ringgit), and the abnormal returns surrounding Malaysian general elections from GE5 (1978) to GE 14 (2018). We also investigate KLCI and ringgit volatility and explore the short- and long-run associations between the two variables.

By employing event-study methodology, we derive the KLCI and ringgit abnormal returns surrounding Malaysian general elections. To examine the volatility and the short- and long-term associations between KLCI and ringgit, we use continuous wavelet power spectrum (CWPS) and wavelet coherence. The empirical results generally do not support an uncertain information hypothesis. Despite the dissociation between KLCI and ringgit in the short term, there appears to be a positive relationship between KLCI and ringgit, in that ringgit leads KLCI in the long term. In our view, Malaysia, being an emerging market, tends to overreact following a general election, regardless of the winning coalition. Aligned with De Bondt and Thaler's (1985) overreaction hypothesis, our results suggest that the investors in the Malaysian equity market would square off their positions before the general election period to avoid potential losses. There is a possibility for KLCI to overreact, causing negative abnormal returns, regardless of which coalition wins the general election.

We add to the growing election literature in several ways. To the best of our knowledge, this study is among the first to explain elections and the financial market puzzle by examining the uncertain information hypothesis in the context of an emerging market like Malaysia. The existing elections research on Malaysia tends to focus on determining whether there is significant change surrounding general elections, without explaining the puzzle. We also explore the behaviour of the ringgit surrounding Malaysian general elections. Further, we also assess the short- and long-run relationships between the KCLI and the ringgit to look at the possibilities of the ringgit causing movement in the KLCI and vice versa. Whereas previous studies on elections in Malaysia cover their impact on the KLCI, no study has investigated the reactions of the ringgit pre and post elections. We aim to fill this research gap and propose some much richer and novel contributions, by scrutinising the impact of

elections on the KLCI and the ringgit, and the relationship between these two assets, while also testing the uncertain information hypothesis. Our research intent is also supported by some newspaper reports that both the KLCI and the ringgit appeared to dip, in a knee-jerk reaction, after the GE14 (2018) [3].

This paper proceeds as follows. We review the literature in Section 2 and discuss the empirical design in Section 3. Section 4 presents our analysis of the findings. Finally, we offer our conclusive remarks in Section 5.

2. Brief literature review

A pivotal question to finance academic and practitioners is whether political elections affect financial markets. Earlier election studies have attempted to explain the US presidential elections and the US stock markets puzzle. Niederhoffer *et al.* (1970) and Riley and Luksetich (1980) find that presidential elections left a significant impact on the US stock markets, with the latter reacting positively to a Republican candidate's victory but adversely to an opposition candidate's victory. The same study also notes the likelihood of the US stock market to move pre- or post-election as a Wall Street folklore, yet finds evidence to support the said folklore. Other studies find small capitalisation stocks to record substantially superior profits throughout Democratic than Republican presidencies (Hensel and Ziemba, 1995; Johnson *et al.*, 1999). While Hensel and Ziemba (1995) utilise monthly returns dataset spanning from 1928 to 1993, Johnson *et al.* (1999) apply annual returns on the 1929 to 1996 dataset.

A stream of studies have explored the link between election uncertainty and stock market returns. Li and Born (2006) use US polling data from 1964 to 2000 to estimate US citizens' voting preference as a proxy of election uncertainty. The authors conclude that the volatility and stock market returns will generally increase as long as the market does not see any candidate taking the lead to win the US presidential election. Li and Born further argue that the stock market is efficient and always reflects political uncertainty in the stock price. Białkowski *et al.* (2008) examine the relationship between national elections and stock market volatility based on 27 OECD countries dataset. The authors observe that the stock index return volatility can soar more than 100% for the duration of election week, suggesting that market participants are shocked by the election results, and that there is massive uncertainty about the newly formed government and its policies. Gemmill (1992) investigates the UK stock and options markets reactions surrounding the UK 1987 election and notes an influential association between UK FTSE100 and polling data. The UK options market was suddenly swarmed by speculators betting for a Conservative loss days before the election, while the polling data suggest otherwise. Owain and Buckle (1994) extend Gemmill's (1992) study by examining whether the UK stock and options markets are informationally efficient based on the UK polling dataset for the 1992 election. They observe that while the UK stock market indicates semi-strong efficiency, the options market appears to be not adequately efficient to warrant a profitable arbitrage.

Against the backdrop of Malaysia, Misman *et al.* (2020) investigate the Malaysian stock market reactions surrounding Malaysian general elections using ordinary least squares (OLS) for election cycles from GE10 to GE14. The authors conclude that the Malaysian stock market does register substantive changes surrounding general elections. Wong and Hooy (2020) analyse the impact of general elections from GE11 to GE13 on Malaysian politically connected firms and find that different types of politically connected firms react differently to elections. Liew and Rowland (2016) and Ying *et al.* (2016) explore the impact of the Malaysian election cycle on the Malaysian stock market. While the former observe that Malaysian general elections influence the Malaysian stock market in GE12 and GE13, the latter study records significant abnormal returns 15-days before and after general elections from GE11 to GE13. Instead of observing the effect of the election cycle on the stock market, Wong and Hooy (2016) examine the impact of the election on government-owned banks in Indonesia,

Malaysia and Thailand from 2000 to 2013. Their empirical results indicate that government-owned register higher abnormal returns than private-owned banks. Finally, Ong *et al.* (2015) explore the link between Malaysian currency and Malaysian stock returns during GE12 and GE13 general elections. Their findings show that the Malaysian currency is inversely related to stock returns before and after election periods.

Proposed by Brown *et al.* (1988), the theory of uncertain information hypothesis predicts that the average reaction following a good or anticipated election result is not as strong as adverse or unanticipated information, but it should be nonnegative. The theory also predicts that when significant unexpected information arrives at a market, investors would require higher compensation from taking that extra risk. Meanwhile, De Bondt and Thaler (1985, 1987) describe investors' overreaction as a market anomaly. Contradictory to Bayes' rules, the theory suggests that most investors are inclined to overreact to unanticipated news or events. National elections can be an example of a dramatic event. The overreaction hypothesis has also been extensively discussed as a market anomaly (see Borgards and Czudaj, 2020; Brown *et al.*, 2014; Fama, 1998; Hirshleifer, 2001; Lo and MacKinlay, 1990).

2.1 Hypotheses

We develop our hypotheses based on Brown *et al.*'s (1988) uncertain information hypothesis, which proposes the following testable propositions: (1) upon the revelation of any substantial unexpected event, stock return variability is expected to increase; (2) positive price changes are expected following adverse events, but nonnegative price changes are expected following positive events; (3) price changes after the event will generally be more extensive for unfavourable events than favourable events if the preference for lower risk declines, and price changes will be the same if the preference for lower-risk remains constant. According to Brown *et al.* (1988), if second and third points are considered jointly, it would suggest that while the normal response after good news may not be as pronounced as that upon bad news, it should be non-negative. Brown *et al.* (1988) further argue that combining the first and second points would mean that in uncertain information hypothesis spirit, investors would require higher compensation for bearing additional risk upon the arrival of substantive unanticipated information.

In our study context, we define an unanticipated event as a change in political power, specifically looking at the case of the ruling coalition Barisan Nasional losing, and the opposition coalition winning the Malaysian general election for the first time in history, in GE14 (2018). GE14's (2018) outcome can serve very well as a proxy for an unanticipated, unfavourable or adverse election result, because that was the first time that the opposition coalition had won a general election in Malaysia since 1957. Hence, Barisan Nasional's 61-year reign as the ruling coalition had finally crumbled. We regard GE14 (2018) as a unique event because, although the opposition coalition started as a dark horse, it was able to muster a sudden, almost-impossible, unprecedented and unanticipated win against the long-standing, dominating, ruling coalition of Barisan Nasional. The GE14 election result could also be deemed an unfavourable or adverse election result. Further, we use GE13 as a proxy for an anticipated, favourable or positive election result. From Brown *et al.*'s (1988) second and third point, we derive H1 and H1a. These two hypotheses should be read together as follows:

H1. $\text{CARs}_{\text{GE14}} > \text{CARs}_{\text{GE13}}$.

H1a. $\text{CARs}_{\text{GE13}} > 0$.

where CARs refers to the cumulative abnormal returns of the Kuala Lumpur Composite Index (KLCI) and the ringgit, respectively [4].

From the first point mentioned by Brown *et al.* (1988), we derive our H2:

H2. $\text{Std. dev. of returns}_{\text{post-election GE14}} > \text{Std. dev. of returns}_{\text{pre-election GE14}}$.

3. Data and methodology

We obtain the daily closing prices of Kuala Lumpur Composite Index (KLCI), Morgan Stanley Capital International (MSCI) World Index (as the benchmark index), and Malaysian ringgit spanning from January 1977 through October 2018 from Bloomberg, covering 10 general elections (GE5 to GE14) in Malaysia [5]. After cleaning for non-trading days, we arrived at 10,271 daily closing prices for KLCI and ringgit datasets. We source the election voting dates from the Election Commission of Malaysia. The Malaysian ruling coalition, Barisan Nasional, won 13 out of 14 general elections since Malaya independence in 1957. However, against all odds, in the 14th general election (GE14) in 2018, the opposition alliance, Pakatan Harapan, won for the first time in history.

Figure 1 compares the cumulative returns between KLCI and MSCI World from 1988 to 2018. We can see a sharp drop in KLCI returns around September 1998. The reason is that 1 September 1998 marked an important date when Deputy Prime Minister Anwar Ibrahim was sacked from his position. KLCI then reacted and tumbled to a historical all-time low of 350 points. Capital control was then imposed to stabilise the Malaysian equity and currency markets. Table 1 shows the voting start date, end date, equity market open date and the name of the newly elected prime minister of the winning coalition that formed the new government of Malaysian general elections, henceforth the GE from GE5 (1978) to GE14 (2018).

3.1 Event-study methodology

To examine the Malaysian stock market's reactions to general elections, we derive the KLCI abnormal returns by applying Brown and Warner's (1985) event study market model. R_{it} represents the daily return (based on the natural log) for the KLCI on day t, and R_{mt} stands for the daily return (based on natural logs) on the MSCI World Index. Like Mohamad *et al.* (2013), we provide an estimation using the event-study market model over the estimation window (days $s = -120$ to $s = -21$, relative to the event date):

$$R_{it} = \widehat{a}_i + \widehat{b}_i R_{mt} + \varepsilon_{is} \tag{1}$$

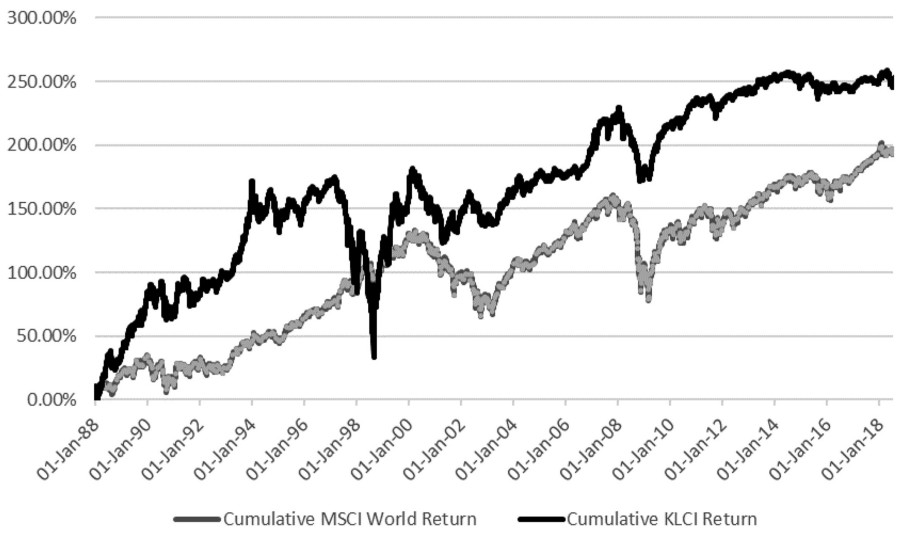


Figure 1.
KLCI vs MSCI world cumulative returns

Note(s): This table compares the cumulative Kuala Lumpur Composite Index (KLCI) against Morgan Stanley Capital World Index (MSCI World) returns from 1988 to 2018

Table 1.
Malaysian general elections from GE5 (1978) to GE14 (2018)

GE	Year	Voting start date	Voting end date	Market open date after election (event date)	Prime minister (after winning)	Winning coalition
5	1978	18-Jul-78	22-Jul-78	24-Jul-78	Hussein Onn	Barisan Nasional
6	1982	22-Apr-82	26-Apr-82	27-Apr-82	Mahathir	Barisan Nasional
7	1986	02-Aug-86	03-Aug-86	04-Aug-86	Mahathir	Barisan Nasional
8	1990	20-Oct-90	21-Oct-90	22-Oct-90	Mahathir	Barisan Nasional
9	1995	24-Apr-95	25-Apr-95	26-Apr-95	Mahathir	Barisan Nasional
10	1999	29-Nov-99	29-Nov-99	30-Nov-99	Mahathir	Barisan Nasional
11	2004	21-Mar-04	21-Mar-04	22-Mar-04	Abdullah Badawi	Barisan Nasional
12	2008	08-Mar-08	08-Mar-08	10-Mar-08	Abdullah Badawi	Barisan Nasional
13	2013	05-May-13	05-May-13	06-May-13	Najib	Barisan Nasional
14	2018	09-May-18	09-May-18	14-May-18	Mahathir	Pakatan Harapan

Note(s): This table provides the details of voting dates, market open date and winning coalition prime minister for each Malaysian general election from GE5 (1978) to GE14 (2018)

$$AR_{it} = R_{it} - \widehat{a}_i - \widehat{b}_i R_{mt} \tag{2}$$

$$CAR_{t1,t2\ (KLCI)} = \sum_{t=t_1}^{t_2} AR_{it} \tag{3}$$

We obtain coefficients $\widehat{a}_i$, $\widehat{b}_i$ by estimating an OLS regression. AR_{it} represents the KLCI abnormal return on day t throughout the event window (days $t = -20$ to $t = 40$, again relative to the event date). $CAR_{t1,\,t2\ (KLCI)}$ is defined as the KLCI cumulative daily abnormal return throughout the event window (from days t_1 to t_2). For tests over multi-day intervals, the test statistic is the ratio of the cumulative abnormal return to its estimated standard deviation.

To scrutinise the impact of the Malaysian general elections on the ringgit, we derive the ringgit abnormal return ($AR_{j,\,t}$) using the mean return model. Specifically, $AR_{j,\,t}$ is obtained by subtracting the arithmetic mean return for the ringgit, denoted by $\overline{R_j}$, computed over the estimation period (from day −120 to day −21), from its return on day t ($R_{j,\,t}$) [6]:

$$AR_{j,\,t} = R_{j,\,t} - \overline{R_j} \tag{5}$$

$$E[R_{j,\,t}] = \overline{R_j} = \frac{1}{120} \sum_{t=-140}^{-21} R_{j,\,t} \tag{6}$$

$$CAR_{t1,t2\,(ringgit)} = \sum_{t=t_1}^{t_2} AR_{j,t} \tag{7}$$

$CAR_{t1,t2\,(ringgit)}$ is described as the ringgit cumulative daily abnormal return on day t throughout the event window (from days t_1 to t_2). Similarly, its test statistic for multi-day interval is also derived from the ratio of the cumulative abnormal return to its estimated standard deviation.

3.2 The continuous wavelet transform (CWT)

A wavelet is described as a smaller form of a wave with its focal energy expressed in time, scale and position, allowing an analysis of similar time-series graphs to frequently display pendular phenomena (Burrus *et al.*, 1998). Wavelet is also expressed as a function with a mean of zero, localised in both time and frequency elements (Grinsted *et al.*, 2004). In and Kim (2012) describe continuous wavelet transform (CWT) as integral over the signal (for all time)

multiplied by the scaled form of the wavelet function ψ, giving rise to wavelet coefficients as a function of scale, time and position. CWT can be used to observe values within a dimensionless time-frequency domain.

Following Burrus *et al.* (1998), the CWT can be expressed as below

$$F(a, b) = \int f(t)\psi\left(\frac{t-a}{b}\right)dt \tag{8}$$

Followed by an inverse transform of,

$$f(t) = \iint F(a, b)\,\psi\left(\frac{t-a}{b}\right)da\,db \tag{9}$$

where $\psi(t)$ denotes the basic wavelet, while $a, b \in \mathbb{R}$ represent real continuous variables. In essence, increasing (decreasing) variable a causes the wavelet to advance (delay) across the time series, thus changing its position, whilst increasing (decreasing) variable b causes the wavelet to expand (compress) in scale length. This continuous wavelet process is completed to capture the infinite levels of granularity in the series. Thus, the spectrum encompasses the shortest (highest frequency) and longest (lowest frequency) possible scales within the time-frequency domain.

3.2.1 Continuous wavelet power spectrum (CWPS). We adopt the continuous wavelet power spectrum (CWPS) to observe the volatility of KLCI and ringgit returns under an infinite resolution within the sample period. We define the chosen Morlet after Grinsted *et al.*'s (2004) specification as below,

$$\psi_0(\eta) = \pi^{-1/4} e^{i\omega_0\eta} e^{-\frac{1}{2}\eta^2} \tag{10}$$

where ω_0 represents the frequency(dimensionless), while η denotes the time (dimensionless). The wavelet may well be expanded or compressed in time by adjusting its scale length (s), such that $\eta = s \cdot t$, and normalising it to have unit energy. Further, we choose the Morlet wavelet with a length of $\omega_0 = 6$ as the basis function due to a well-balanced application between time and frequency localisations.

Hence, we define CWT of a time series $(X_n, n = 1, \ldots, N)$ with identical time steps δt, based on the convolution of the series with the scaled and the normalised Morlet wavelet as follows,

$$W_n^X(s) = \sqrt{\frac{\delta t}{s}} \sum_{n'=1}^{N} x_{n'}\,\psi_0\left[(n'-n)\frac{\delta t}{s}\right] \tag{11}$$

The absolute values squared of this process is defined as the wavelet power, or $|W_n^X(s)|^2$. The CWT has edge components produced due to the wavelet not being entirely localised in time; hence, the cone of influence (COI) is introduced and applied. These effects are located at this bordered region and beyond. It is also known as the wavelet power, produced by a discontinuity at the edge that may distort the image process. Therefore, values localised in this region are not interpreted for analysis due to being potentially biased estimates.

3.2.2 Wavelet coherence and phase difference. Torrence and Webster (1999) analyse the energy power spectrum of time series using the wavelet coherence approach based on the Morlet CWT specification. The idea of wavelet coherence is to measure the signals responses between KLCI and ringgit. There is a growing debate on the similarity between "correlation" and "coherence" and what they examine. According to In and Kim (2012), correlation is more sensitive to the signals differences between two variables, while coherence is relatively more stable despite these signals differences. Hence, we can conclude that correlation is sensitive to

noise while coherence remains steady in examining the signals feedback of KLCI and ringgit. Correlation and coherence are constantly used together for robustness purposes because the former is based on the Maximal Overlap Discrete Wavelet Transform (MODWT) specification. In contrast, coherence is based on the CWT. Both measures complement each other as a procedure for quantifying the signals connectedness of the time series.

We calculate wavelet coherence as the squared absolute value of the smoothened cross wavelet spectra, $W_{x,y}(u,s) = W_x(u,s)W_y^*(u,s)$. The value or $R \rightarrow R^2$ is normalised by the product of the smoothened series of individual wavelet power spectra. The estimated coherence spectrum of KLCI–ringgit for various frequencies are specified as follows:

$$R^2 = \frac{\left|S[s^{-1}W_{x,y}(u,s)]\right|^2}{S\left[s^{-1}|W_x(u,s)|^2\right)\Big]S\left[s^{-1}|W_y(u,s)|^2\right]} \tag{12}$$

where R^2 is the wavelet coherence, S is the smoothing operator, hourly and daily KLCI and ringgit are denoted by x and y, respectively. The magnitude of wavelet coherence can be described as $0 \leq R^2(u,s) \leq 1$.

Wavelet coherence is also equipped with phase difference, which provides the details on the oscillation of KLCI and ringgit. The vectored rotary arrows show the phase difference: a clockwise arrow means that both KLCI and ringgit are in phase, thus indicating that KLCI is leading ringgit. On the other hand, an arrow that points anti-clockwise implies that KLCI and ringgit are in anti-phase, thus indicating that ringgit is leading KLCI.

4. Empirical results

4.1 Event-study methodology

Based on Brown and Warner's (1985) event-study methodology, we calculate and show the KLCI cumulative abnormal returns (CARs) for multiple event windows following GE5 to GE14 elections in Table 2 and Figure 2. Based on the (0,+40) event window, the CARs for GE5, GE11, and GE14 are significantly negative at 5 and 1% level, respectively. GE13 CARs are significantly positive for (0,+10) and (0,+20) event windows (at 1%). Recall H1 and H1a; we deem the GE14 election results as bad, while the GE13 election results as good. Brown *et al.* (1988) predict that while the normal response after good news may not be as pronounced as that upon bad news, it should be nonnegative. Here, we find that the KLCI CARs for post-election, in (0,+10), (0,+20) and (0,+40) for GE14 are not greater than that of GE13. Although we find that GE13 post-election CARs for (0,+10) and (0,+20) are significantly positive, we reject H1, as H1 and H1a should be read jointly.

The opposition coalition, Pakatan Harapan, won for the first time in GE14 (2018), resulting in a change of government for the first time in history in Malaysia. As a result, the CARs for the (0,+40) event window is significantly negative. It appears that even after the uncertainty is resolved, investors in the Malaysian equity market still reacted negatively to the GE14 election result. Interestingly, in both GE5 (1978) and GE11 (2004), when the ruling coalition Barisan Nasional won the elections (these are deemed as good news), the KLCI reacted negatively. The CARs for (0,+40) event window were significantly negative at 5 and 1%, respectively.

From Table 2, we can see the post-elections of GE7, GE8, GE9 and GE10 derive positive CARs, but these results are not significant statistically. Figure 2 suggests that apart from GE7, GE8, GE9 and GE10, visually, other general elections reacted negatively post elections, with GE5, GE11 and GE14 indicating statistically significant negative CARs. These results indicate that the Malaysian equity market has reacted somewhat differently in each general election.

Table 2. KLCI cumulative abnormal returns (CARs) surrounding Malaysian general elections

Event window	GE5 (1978)	GE6 (1982)	GE7 (1986)	GE8 (1990)	GE9 (1995)	GE10 (1999)	GE11 (2004)	GE12 (2008)	GE13 (2013)	GE14 (2018)
(−20,−1)	2.01%	4.85%	−2.28%	−12.40%	−1.65%	−4.74%	3.38%	−10.25%*	0.07%	−1.17%
	(0.625)	(0.731)	(−0.295)	(−1.537)	(−0.228)	(−0.532)	(0.875)	(−1.794)	(0.031)	(−0.455)
(−10,−1)	−3.84%*	3.20%	−0.25%	−3.63%	1.14%	1.62%	1.37%	−5.44%	−0.85%	−2.23%
	(−1.749)	(0.709)	(−0.047)	(−0.652)	(0.235)	(0.269)	(0.517)	(−1.396)	(−0.553)	(−1.277)
(0,+10)	2.88%	3.58%	4.71%	2.73%	5.16%	2.65%	−3.32%	−6.63%	4.65%***	−4.38%**
	(1.213)	(0.753)	(0.842)	(0.472)	(1.01)	(0.42)	(−1.218)	(−1.612)	(2.9)	(−2.387)
(0,+20)	2.96%	1.17%	16.72%**	3.48%	8.94%	3.48%	−8.17%**	−8.80%	4.52%**	−5.56%**
	(0.89)	(0.173)	(2.119)	(0.421)	(1.22)	(0.382)	(−2.093)	(−1.489)	(1.972)	(−2.110)
(0,+30)	5.11%	−5.22%	13.45%	4.00%	11.28%	18.63%	−10.25%**	−5.82%	4.26%	−11.42%***
	(1.215)	(−0.61)	(1.359)	(0.384)	(1.224)	(1.631)	(−2.083)	(−0.783)	(1.477)	(−3.448)
(0,+40)	−9.84%**	−5.03%	9.18%	5.67%	11.56%	21.73%	−17.27%***	−6.59%	4.04%	−10.64%***
	(−2.000)	(−0.494)	(0.78)	(0.459)	(1.056)	(1.607)	(−2.917)	(−0.747)	(1.177)	(−2.707)
(−20,+40)	−7.83%	−0.19%	6.91%	−6.73%	9.90%	16.99%	−13.89%*	−16.8%	4.1%	−11.81%**
	(−1.225)	(−0.014)	(0.451)	(−0.42)	(0.695)	(0.97)	(−1.793)	(−1.478)	(0.929)	(−2.322)

Note(s): This table shows the cumulative abnormal returns (CARs) for KLCI at various event windows for all Malaysian general elections from GE5 (1978) to GE14 (2018). Day 0 is event day or election day. Test statistics are in parentheses. *, **, *** denote significance at 10, 5 and 1%, respectively

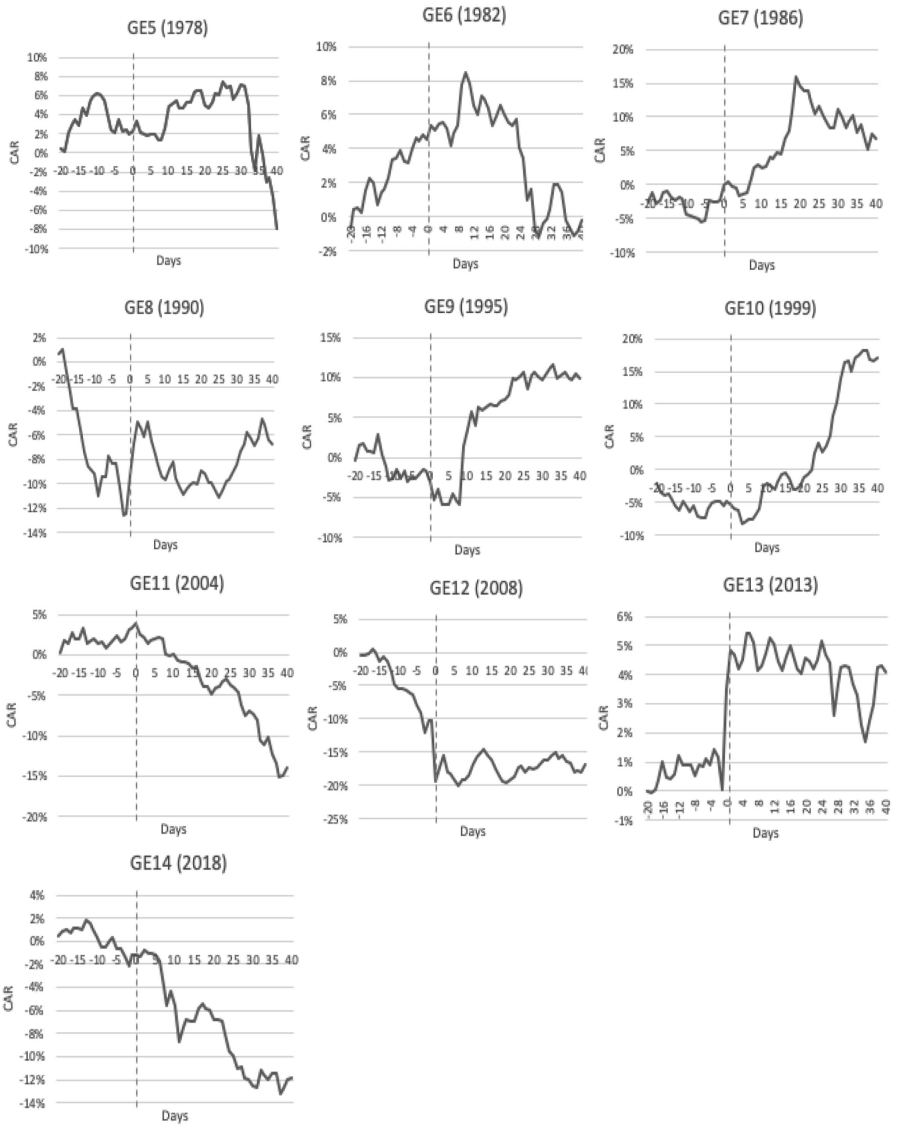


Figure 2.
KLCI cumulative abnormal returns (CARs) surrounding Malaysian general elections

Note(s): This figure depicts the KLCI cumulative abnormal returns (CARs) for (–20, +40) event windows for the Malaysian general elections from GE5 (1978) to GE14 (2018). Day 0, marked by the dashed line, is event day or election day

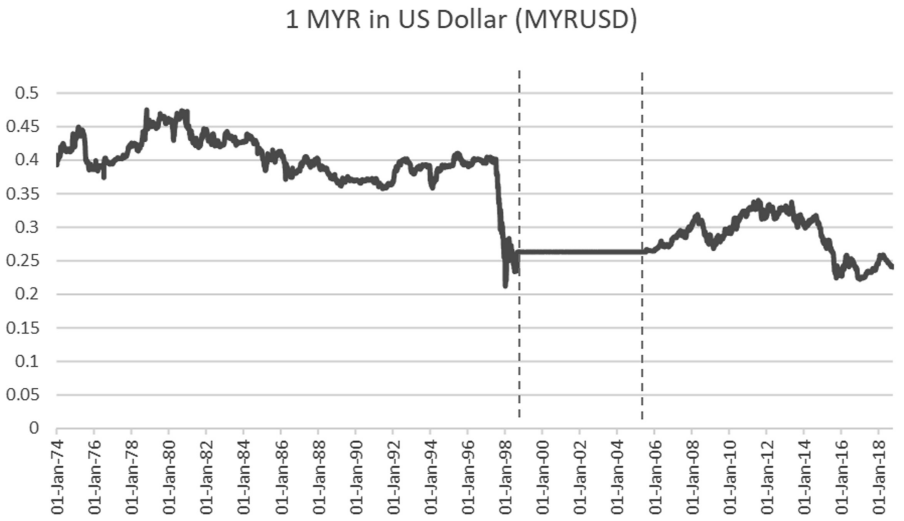
We do not find supporting evidence for the uncertain information hypothesis based on the KLCI results. By and large, our KLCI results seem to deviate from those of Furió and Pardo (2012) and Pantzalis *et al.* (2000), possibly due to the emerging nature of the Malaysian market, which may be dominated by local retail investors. The players in the Malaysian stock market seem to have overreacted after the election, which can be explained by the overreaction hypothesis (De Bondt and Thaler, 1985, 1987).

Figure 3 provides an overview of the Malaysian ringgit's performance and time evolution from 1974 through to 2018. Following the East Asian financial crisis that rocked the currencies of Thailand, the Philippines, Indonesia and Malaysia in 1997–1998, Malaysia decided not to ask for International Monetary Fund (IMF) aid. Instead, it imposed capital control and pegged the ringgit to the US dollar (Mohamad *et al.*, 2021). Since the ringgit was pegged from September 1998 to July 2005, we can see from Figure 3 that the ringgit's value was stagnant during this period. In this paper, we exclude GE10 and GE11 from the ringgit event study analysis.

In a similar vein, we are also interested in discovering the impact of the Malaysian general elections on the ringgit's behaviour. Based on the event study mean return model, we calculate the ringgit CARs over various event windows for GE5 (1978) – GE9 (1995) and for GE12 (2008) – GE14 (2018), and present them in Table 3 and Figure 4. While the CARs for GE12 (2008), GE13 (2013) and GE14 (2018) show a clear downward trend, the CARs for GE5 (1978), GE7 (1986) and GE9 (1995) portray a strong upward movement after the election days.

Further, to test for uncertain information hypothesis as in H1 and H1a, the ringgit CARs in GE14 (2018) must be higher than GE13 (2014)'s CARs and furthermore, the GE13 (2014)'s CARs must be positive. However, for the ringgit market, we do not find supporting evidence for the uncertain information hypothesis in all multi-day intervals.

We interpret our ringgit results as generally consistent with the overreaction hypothesis. The fact that the ringgit yielded negative abnormal returns after elections during the post-peg period (GE12 [2008] – GE14 [2018]) as compared to the pre-peg period (GE5 [1978] – GE9 [1995]), can be viewed as overreaction from foreign fund managers. After the ringgit was unpegged from the US dollar in July 2005, the fund managers would have been able to sell their portfolios and exit the Malaysian equity market if they had been uncertain about the election results and the policies of newly formed governments.



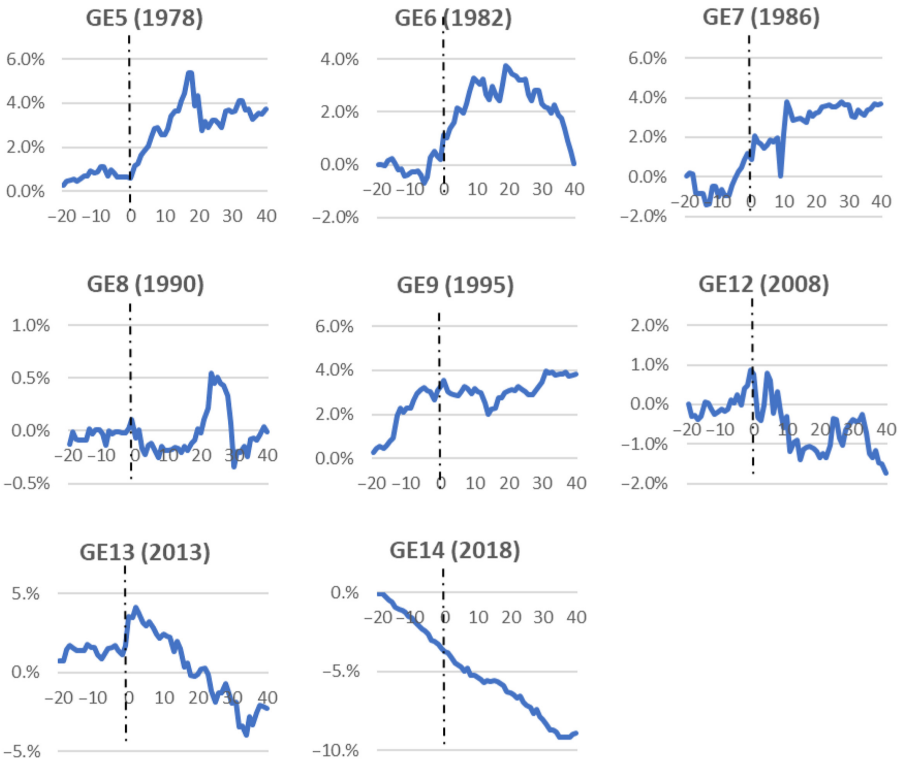
Note(s): This figure portrays the time evolution of ringgit against the US dollar. The period between the two dashed lines denotes the Malaysian capital control period and ringgit is pegged to the US dollar

Figure 3.
Time evolution of ringgit (MYRUSD) from 1974 to 2018

Table 3.
Ringgit cumulative abnormal returns (CARs) surrounding Malaysian general elections

Event window	GE5 (1978)	GE6 (1982)	GE7 (1986)	GE8 (1990)	GE9 (1995)	GE12 (2008)	GE13 (2013)	GE14 (2018)
(−20,−1)	0.63%	0.21%	1.18%	0.10%	3.08%	0.88%	1.70%	−3.53%
	(0.037)	(0.009)	(0.028)	(0.015)	(0.106)	(0.043)	(0.05)	(−0.386)
(−10,−1)	−0.19%	0.59%	1.66%	0.10%	0.97%	1.07%	0.11%	−2.03%
	(−0.01)	(0.02)	(0.049)	(0.015)	(0.04)	(0.048)	(0.003)	(−0.214)
(0,+10)	1.94%	2.98%	1.01%*	−0.29%	0.09%	−1.19%	0.72%*	−1.84%*
	(0.076)	(0.087)	(1.04)	(−0.031)	(0.004)	(−0.021)	(1.13)	(−1.01)
(0,+20)	3.73%	3.43%	2.03%***	−0.12%	−0.01%	−2.22%	−1.82%***	−2.82%***
	(0.08)	(0.086)	(2.65)	(−0.016)	(−0.001)	(−0.047)	(−2.92)	(−6.94)
(0,+30)	2.99%	2.09%	2.48%***	−0.45%	0.38%	−1.26%	−3.62%***	−4.53%***
	(0.057)	(0.054)	(3.78)	(−0.034)	(0.017)	(−0.029)	(−5.98)	(−4.84)
(0,+40)	3.12%	−0.15%	2.50%***	−0.11%	0.74%	−2.62%	−3.98%***	−5.34%***
	(0.066)	(−0.004)	(4.28)	(−0.009)	(0.034)	(−0.066)	(−6.29)	(−7.61)
(−20,+40)	3.75%	0.05%	3.68%***	−0.01%	3.81%	−1.7%	−2.28%***	−8.87%***
	(0.094)	(0.002)	(3.68)	(−0.001)	(0.153)	(−0.05)	(−4.46)	(−5.47)

Note(s): This table shows the cumulative abnormal returns (CARs) for ringgit against the US dollar at various event windows for all Malaysian general elections from GE5 (1978) to GE14 (2018). Day 0 is event day or election day. Test statistics are in parentheses. *, **, *** denote significance at 10, 5 and 1%, respectively. No CARs are recorded for GE10 (1999) and GE11 (2004) as ringgit was pegged to the US dollar during Malaysia capital control period from September 1998 to July 2005



Note(s): This figure presents the ringgit cumulative abnormal returns (CARs) for (–20, +40) event windows for the Malaysian general elections from GE5 (1978) to GE14 (2018). Day 0, marked by the dashed line, is event day or election day. No CARs are recorded for GE10 (1999) and GE11 (2004) as ringgit was pegged to the US dollar during Malaysia capital control period from September 1998 to July 2005

Figure 4. Ringgit cumulative average abnormal return (CARs) surrounding Malaysian general elections

4.2 Standard deviation of returns of KLCI and ringgit markets' returns surrounding general elections

Brown *et al.* (1988) predict that stock return variability is expected to increase upon the revelation of any substantial unexpected event. This statement also serves as our H2. To test for this hypothesis, we calculate standard deviations of KLCI and ringgit returns before and after the elections over six intervals: (−40,−1), (−20,−1), (−10,−1), (1,10), (1,20) and (1,40). We compare the standard deviations in the form of heatmaps before and after the elections for both KLCI and ringgit and present the results in Table 3. While the stronger reddish heatmaps indicate stronger standard deviations across elections and intervals, the bold figures denote higher standard deviations between before and after the elections. Pakatan Harapan won the latest election, GE14, despite being an opposition coalition, thus we can deem the GE14 election result as an unanticipated event, hence should yield higher standard deviations after elections. Interestingly, as can be seen from Table 4, although GE14 results generally show higher variability after the election for both KLCI and ringgit for almost all event windows, GE10, GE12 and GE13 (which we deem as good or anticipated event) also depict higher standard deviations after the election.

Panel A: KLCI standard deviation of returns

GE	Before election (–40, –1)	(–20, –1)	(–10, –1)	After election (1, 10)	(1, 20)	(1, 40)
5	0.9370	**1.0354**	**0.9529**	0.6973	0.7454	1.4455
6	1.0211	0.6750	0.5077	**0.9488**	**0.9370**	1.0318
7	**1.7554**	1.1796	**1.2873**	1.1080	**1.4821**	1.6119
8	**2.2809**	**1.6865**	0.9515	**2.1565**	1.5555	1.3367
9	**1.3950**	1.2349	0.7492	**1.9222**	**1.5634**	1.2798
10	1.2609	0.9729	0.8063	**1.3300**	**1.0231**	**1.4311**
11	0.8332	**0.8740**	0.6531	**0.7557**	0.6491	**0.8612**
12	1.4688	1.0839	1.2521	**3.5987**	**2.6295**	1.9133
13	0.4209	0.3230	0.3130	**1.2120**	**0.9192**	0.8294
14	0.5996	0.5611	0.5380	**0.9952**	**1.1502**	0.9724

Panel B: Ringgit standard deviation of returns

GE	Before election (–40, –1)	(–20, –1)	(–10, –1)	After election (1, 10)	(1, 20)	(1, 40)
5	0.1620	0.1689	0.1915	**0.2601**	**0.4746**	**0.4808**
6	0.2645	0.2335	**0.2989**	0.2792	**0.3685**	**0.3511**
7	0.3362	0.4208	0.3398	**1.0499**	**0.8309**	**0.5995**
8	0.0993	0.0695	0.0645	**0.0861**	**0.0703**	**0.1204**
9	**0.2532**	**0.2893**	**0.2461**	0.2456	0.2651	0.217
10	0	0	0	0	0	0
11	0	0	0	0	0	0
12	0.2752	0.2046	0.2211	**0.6113**	**0.4828**	**0.3992**
13	0.2725	0.3437	0.3299	**0.3760**	**0.4781**	**0.5748**
14	**0.1994**	0.0915	0.0949	0.1916	**0.1706**	**0.1886**

Note(s): This table shows the heatmaps of standard deviations of returns of KLCI and ringgit surrounding Malaysian general elections from GE5 (1978) to GE14 (2018) at various event windows. The bold figures in red cells denote higher standard deviations. No standard deviation of returns is recorded for GE10 (1999) and GE11 (2004) as ringgit was pegged to the US dollar during Malaysia capital control period from September 1998 to July 2005

Table 4.
KLCI and ringgit standard deviations of returns surrounding Malaysian general elections

While the result of GE14 result is consistent with H2, so are the results of GE10, GE12 and GE13. While we find weak supporting evidence for H2, we must reject H1. Although we have observed some evidence supporting the uncertain information hypothesis, the results are not very convincing. In the words of Brown *et al.* (1988), "stock return variability will increase following the announcement of any major unanticipated event." However, for Malaysian national elections, we also find that KLCI volatility increases after the announcement of anticipated election results (i.e. victory by the ruling coalition), particularly in GE10 (1999), GE12 (2008) and GE13 (2013). Further, Brown *et al.* (1988) state that while the average response after good news may not be as pronounced as that upon bad news, it should be nonnegative. On the contrary, we do find significant negative CARs following good news (victory by ruling coalition) in GE5 (1978) and GE11 (2004).

What do we make of our results so far? First and foremost, we argue that our results generally do not show evidence in support of the uncertain information hypothesis, and are at odds with those of Furió and Pardo (2012) and Pantzalis *et al.* (2000). Instead, our Malaysian election results could provide support for the overreaction hypothesis (De Bondt and Thaler, 1985). In an emerging market like Malaysia, investors might overreact (strongly and

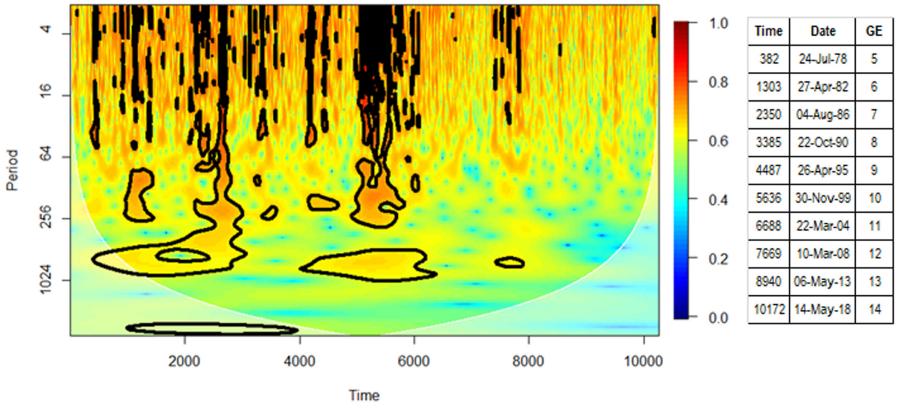
adversely) to election results, regardless of whether they represent good or bad news, and whether they are anticipated or unanticipated. We posit that investors in Malaysian markets may have been cautious about the prospect of a newly formed government and its potential new policies regarding the Malaysian investors and financial community.

4.3 The continuous wavelet transform (CWT)

In this section, we seek answers for two questions: (1) how volatile are KLCI and ringgit based on daily closing prices? and (2) is there any relationship between KLCI and ringgit throughout the sample period? To answer these questions, we employ CWPS and wavelet coherence and phase difference and report the findings as follows:

4.3.1 Continuous wavelet power spectrum (CWPS). Figures 5 and 6 present the CWPS of KLCI and ringgit daily log-return series from GE5 to GE14 (from 1977 to 2018). In Figure 5, we can see noticeable evidence of short-term volatility for KLCI, particularly before 2000, between 4- and 64-days horizon. We believe that KLCI was particularly volatile before the capital control was enacted, and ringgit was pegged starting from September 1998. The capital control may have caused foreign fund managers to exit the Malaysian equity market before the imposition of capital control. The Malaysian government enforced capital control from September 1998 to July 2005 [7]. In our view, without the participation of the foreign fund managers, KLCI would turn quiet. Some sporadic elements of variability persisted between the 256- and 1024-day horizon, but after capital control was enforced, KLCI appeared to be relatively stable between the 64- to 1024-day horizon. There is a slight sign of volatility in the short-term for less than the 64-day horizon, around 2008–2009. The 2008–2009 period marks the subprime crisis, with many countries worldwide blaming short-selling and banning short-selling in their equity markets [8].

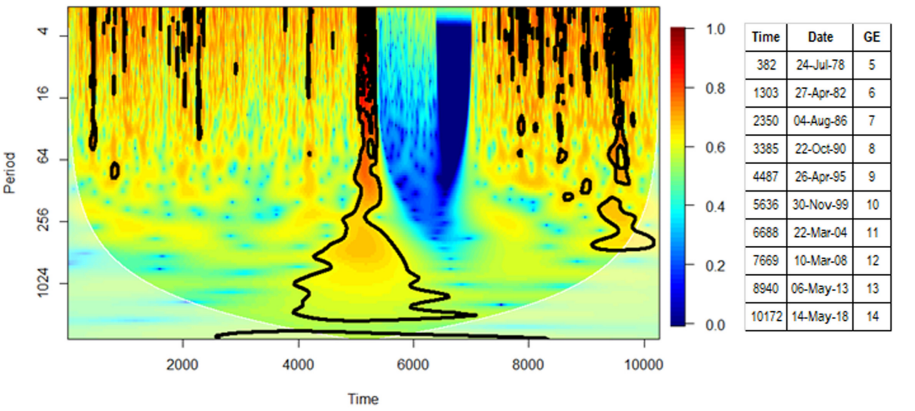
In Figure 6, we could see some waves of volatility for ringgit, particularly for less than the 64-day horizon, except for the 1998–2005 period (indicated by the blue spot). Such represents the capital control period. Just before the capital control, ringgit appeared to experience extreme volatility for all the 4-, 16-, 64-, 256- and 1024-day horizon. Ringgit dropped from



Time	Date	GE
382	24-Jul-78	5
1303	27-Apr-82	6
2350	04-Aug-86	7
3385	22-Oct-90	8
4487	26-Apr-95	9
5636	30-Nov-99	10
6688	22-Mar-04	11
7669	10-Mar-08	12
8940	06-May-13	13
10172	14-May-18	14

Note(s): This figure shows the KLCI continuous wavelet power spectrum (CWPS) based on daily log-returns from 1977 to 2018. The thick black contour indicates the 5% significance level against red noise (region of significance). The cone of influence (faded area) specifies the region affected by edge effects. The code for power ranges from blue to red, as denoted in the colour bar (colours closer to 1.0 indicate higher power)

Figure 5.
KLCI daily returns continuous wavelet power spectrum (CWPS), 1977–2018



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6688	22-Mar-04	11
7669	10-Mar-08	12
8940	06-May-13	13
10172	14-May-18	14

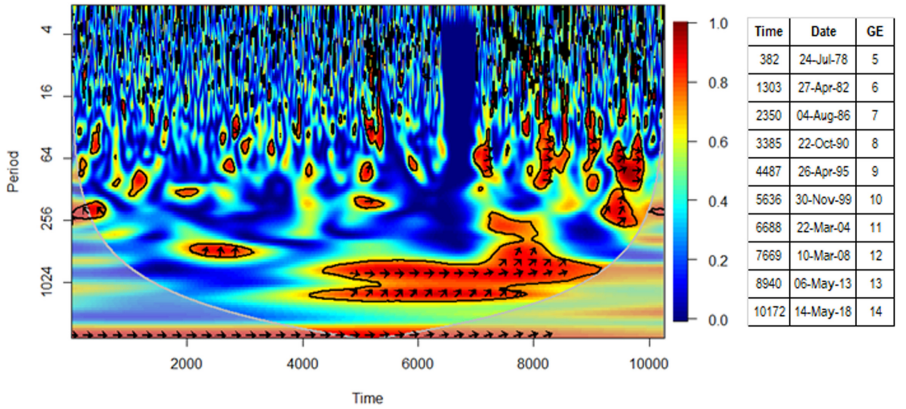
Figure 6.
Ringgit daily returns continuous wavelet power spectrum (CWPS), 1977–2018

Note(s): This figure visualises the ringgit continuous wavelet power spectrum (CWPS) based on daily log-returns from 1977 to 2018. The thick black contour indicates the 5% significance level against red noise (region of significance). The cone of influence (faded area) specifies the region affected by edge effects. The code for power ranges from blue to red, as denoted in the colour bar (colours closer to 1.0 indicate higher power)

$0.40 to $0.22 in about 12 months before capital control was imposed. Later, ringgit was pegged to the US Dollar at about $0.26 or RM3.80 for 1$ (refer to earlier Figure 3).

4.3.2 Wavelet coherence and phase difference. In this section, we explore the association between KLCI and ringgit using wavelet coherence and phase difference. Figure 7 shows the wavelet coherence of daily log-return series of KLCI and ringgit from 1977 to 2018, using the CWT through Monte Carlo simulations ($r = 1000$). The thick black curve signifies the 5% level of significance against the red noise. The faded area denotes the region influenced by edge effects. The assigned colour for coherence spans from blue (indicates low intensity) to red (signifies high energy), as denoted in the colour bar. The arrows specifically imply the phase difference between the two series (KLCI and ringgit returns). Arrows aiming to the right suggest that both variables are moving in phase (cyclic effect). Arrows aiming to the left suggest that both variables moving are out-of-phase (anti-cyclical effect). We can notice that most regions are dominated by blue, indicating a very low coherence between KLCI and ringgit in the short horizon (less than 256-days horizon) for a sample period from 1977 to 2018. Between the 256- and 1024-day horizon, there is evidence of an in-phase cyclical effect between KLCI and ringgit, particularly from 1995 to 2013. The arrows in the red areas, between the 256- and 1024-day horizon, seem to point to the east and northeast. The pattern of the arrows provides two indications in the long horizon: (1) ringgit being perfectly correlated with KLCI and (2) ringgit leading KLCI. Therefore, we can say that there is a positive long-run relationship between KLCI and ringgit in half of the sample period, with ringgit leading KLCI in the long horizon. Figure 8 illustrates the phase difference and the meaning of arrows pointing to each intercardinal direction.

The CWPS and wavelet coherence and phase difference (Figures 5–7) suggest that while KCLI and ringgit are somewhat volatile in the short run, they are quite independent of each other in the short run. Ringgit movement is stagnant as it is pegged to the US Dollar during the capital control period from September 1998 to July 2005. There is evidence of a positive relationship (in-phase) between KLCI and ringgit and ringgit leading KLCI in the long run (1024-day horizon). In the short run, however, there is no relationship between KLCI and



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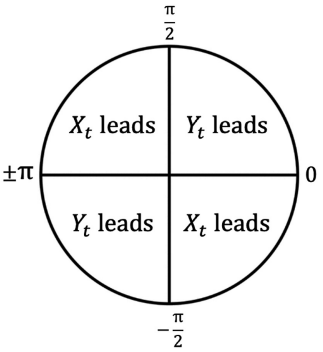
8940	06-May-13	13
10172	14-May-18	14

Note(s): This figure shows the wavelet coherence based on daily log-returns between KLCI and ringgit from 1977 to 2018, using the continuous wavelet transform (CWT) through Monte Carlo simulations (r = 1000). The thick black contour indicates the 5% significance level against red noise. The cone of influence (faded area) specifies the region affected by edge effects. The colour code for coherence ranges from blue (low intensity) to red (high intensity), as denoted in the colour bar. The arrows indicate the phase difference between the two series. Arrows pointing to the right indicate that both variables are in-phase (cyclic effect). Arrows pointing to the left show the variables are out-of-phase (anti-cyclical effect)

Figure 7.
Wavelet coherence KLCI-ringgit, 1977–2018



Note(s): This figure illustrates the phase difference of two time series. The right half-circle displays an in-phase relationship, whereas the left half-circle displays an anti-phase co-movement. Arrows pointing at 0 indicate that the two series are perfectly in-phase, whereas arrows pointing at ±π indicate that they are perfectly anti-phased. Arrows pointing southeast and northwest indicate that X_t is leading. Arrows pointing southwest and northeast suggest Y_t is leading

Figure 8.
Wavelet phase difference

ringgit. Our results suggest that in the short run, KLCI volatility is not caused by ringgit volatility and vice-versa.

5. Conclusion

This study aims to explore the election and financial markets puzzle within an emerging market like Malaysia. Our objectives are two-fold: (1) to investigate the reactions of the

Malaysian equity market (KLCI) and ringgit surrounding the national elections from GE5 (1978) to GE14 and test for Brown *et al.*'s (1988) uncertain information hypothesis, and (2) to examine KLCI and ringgit volatility and analyse the short- and long-run relationships between the KLCI and ringgit. Regarding the first objective, we note that the uncertain information hypothesis predicts that investors would require higher compensation for bearing additional risks upon the arrival of unanticipated substantive information. This hypothesis also postulates that while the average reaction following good or anticipated election result is not as strong as adverse or unanticipated information, it should be nonnegative. Concerning the second objective, we employ event-study methodology, CWPS, and wavelet coherence.

We observe higher standard deviations post-elections for KLCI, not only for the unanticipated event (after the ruling coalition's loss in GE14, 2018), but also after the ruling coalition's victory in other general elections, particularly GE10 (1999), GE12 (2008), and GE13 (2013). Meanwhile KLCI also shows significant negative CARs post-election in GE5 (2004), GE11 (1978) and GE14 (2018). Thus, our results generally do not find support for the uncertain information hypothesis but are inclined towards De Bondt and Thaler's (1985) overreaction hypothesis. We argue that Malaysia, being an emerging market, tends to overreact following general elections, regardless of the winning coalition.

We also find that following the election, ringgit yields a positive abnormal return in the pre-peg period (GE5 [1978] – GE9 [1995]) but negative abnormal returns in the post-peg period (GE12 [2008] – GE14 [2018]). As far as volatility is concerned, we detect considerable short-term volatility for KLCI and ringgit before the capital control period. However, after the capital control was lifted, ringgit has continued to revolve. Overall, while there is no relationship between KLCI and ringgit in the short term, we observe a positive relationship between KLCI and ringgit, that is, ringgit leads KLCI in the long term.

Our empirical results carry weight for academia and practice on several grounds. First, this study is among the first to examine the behaviour of equity and currency markets surrounding election cycles in an emerging market like Malaysia, utilising the most extensive dataset. We cover ten general elections from GE5 (1978) to GE19 (2018) in Malaysia. Our view on the investors' disposition in the Malaysian equity market is to exit the market before general elections to avoid potential losses. KLCI tends to fluctuate and can register negative abnormal returns despite the ruling coalition winning the general election. If the ruling coalition loses the general election, more significant variability and negative abnormal returns are possible. Second, the Malaysian equity market tends to overreact. This finding coheres with De Bondt and Thaler's (1985) overreaction hypothesis, suggesting that investors in the Malaysian equity market tend to react strongly (or overreact) to election results. Finally, this study also provides evidence against the notion of the equity market in an emerging market like Malaysia being informationally efficient.

Notes

1. See https://theindependent.sg/pap-jumps-to-third-spot-in-list-of-worlds-longest-serving-ruling-parties-still-in-power-after-malaysias-historic-ge2018/
2. See https://www.bloomberg.com/news/articles/2018-05-09/mahathir-wins-malaysia-election-in-historic-power-shift
3. See https://www.theedgemarkets.com/article/fbm-klci-hit-biggest-singleday-drop-2008 (The Edge, 31 May 2018); https://www.nst.com.my/business/2018/05/368508/ringgit-dip-knee-jerk-reaction (New Straits Times, 11 May 2018).
4. The CARs for KLCI and ringgit are also described in Eqs (3) and (7).
5. We opt MSCI World index in preference to MSCI All Country World Index (ACWI) because Bloomberg only provides the latter's data from 1988 onwards. KLCI commences in January 1977 with a base value of 100.

6. *j* and *i* denote ringgit and KLCI, respectively.
7. There are a lot of debates regarding the best approach to deal with the currency crisis. See Kaplan and Rodrik (2001), Krugman (1999), Mohamad *et al.* (2021) for diverging views regarding capital control.
8. See Mohamad *et al.* (2013, 2016, 2015) for a discussion on short-selling ban in the UK equity and ETF markets.

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