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Abstract

In this paper a news model of stock price determination is specified and estimated using the KSE index as the price variable over the period January 1996-December 2004. Of the five explanatory news variables, only the news terms of the money supply and government revenue turned out to be significant and correctly signed. Some weaker evidence is also found for the effect of the interest rate news term. The news model shows little dynamics, implying that news is reflected rather quickly on stock prices. It is also demonstrated that stock prices react to the media news and announcements, but it is not possible to measure the unanticipated components of the announcements in the absence of a proper survey of opinions.

ملخص

يتم في هذا البحث توضيح وتقييم نموذج إخباري لتحديد أسعار الأسهم باستخدام مؤشر بورصة كراتشي للأوراق المالية كمتغير سعري خلال الفترة من يناير 1996 إلى ديسمبر 2004. ولم يثبت أية أهمية أو دقة في الاختيار من بين المتغيرات الإخبارية التوضيحية الخمسة سوى للعرض النقدي وإيرادات الحكومة. أما المصطلح الإخباري سعر الفائدة فقد ثبت أنه ذات تأثير أقل. ولا يحظى النموذج الإخباري إلا بقدر ضئيل من الديناميكية إذ تنعكس الأخبار بشكل سريع جدا على أسعار الأسهم. ويتبين أيضا أن أسعار الأسهم تتأثر بالأخبار والتصريحات الإعلامية، ولكنه لا يمكن قياس المكونات غير المتوقعة للتصريحات في غياب مسح مناسب للآراء

Introduction

A market is said to be efficient if current prices reflect all available information, so that the excess return on any speculative investment is uncorrelated with any form of costless information available at the time an investor's decision is made. Stock prices reflect expectations concerning the future course of events. Therefore, new information that results in changes in expectations is immediately reflected in stock prices, eliminating any profit opportunities. It follows that only surprises, or news, should result in stock price movements in an efficient stock market (or any other financial market) characterized by rational expectations.

The term "news" refers to unanticipated events that pertain to the determination of, or have an effect on, stock prices and financial prices in general. In a macroeconomic sense, news is any unanticipated movement in the macroeconomic variables that affect stock prices. For example, if the expected monetary growth rate (as gleaned from a survey, for example) is 3 per cent but it actually turns out to be 5 per cent, then the news component is 2 per cent. The news model in this case tells us that what affects stock prices is not the total change in the underlying variable (such as the money supply), but the unanticipated component. But news is not only restricted to macroeconomic variables. The empirical work on the news model considers news as related to the IMF events, announcements on bank mergers, announcements on changes in paid-up capital, earnings preannouncements, dividend announcements, corporate investment, equity offering announcements, fraudulent financial reporting, corporate misconduct and insider trading, layoff announcements, real estate news, syndicated loan announcements, stock split announcements, and so on. News may also refer to non-economic, non-corporate announcements such as political events that affect financial prices.

Although the terms "announcement" and "news" are sometimes used interchangeably, the precise definition of news in an economic sense is that it pertains to unanticipated announcements or the deviation of what is announced from what was anticipated prior to the announcement. If an announcement has been totally unexpected (such as the assassination of a political leader) then the whole announcement is news. This precise definition of news is the source of measurement problems that hinders empirical work on the effect of news. In the case of an isolated incident, it is naturally impossible to measure news.

The prime objective of this paper is to specify and test a macroeconomic news model of stock prices for the emerging market of Kuwait. The paper is organized as follows. The starting point is an evaluation of the existing empirical evidence on the news model as applied to stock markets in particular and financial markets in general. This is followed by the specification of the model, the justification of the explanatory variables, and the description of the methodology used to extract the news components and the testing methodology in general. Thereafter, the results of empirical testing are presented, followed by a description of the behavior of stock prices in response to various announcements transmitted by the media on economic and other issues. The last section of the paper contains some concluding remarks.

Existing Evidence on the Role of News

Earlier studies of the effect of news on stock prices attempted to test the efficient market hypothesis to find out how fast security prices respond to news. These studies provided little evidence supporting the efficient market hypothesis, expressing concern about the difficulty of distinguishing between anticipated and unanticipated events. Fama et al (1969) stated that although stock splits were rapidly incorporated in stock prices and that it was difficult to distinguish between expected and unexpected splits. Waud (1970) found a significantly

negative impact of discount rate changes on stock prices, although he did not investigate how fast these changes were reflected on stock prices. Both Castanians (1979) and Schwert (1981) were unsuccessful in distinguishing between expected and unexpected changes.

A study by Pearce and Roley (1983) found stock prices response to money stock announcements to be consistent with the efficient market hypothesis, attributing the significant effect to unexpected money stock changes. Likewise, Niederhoffer (1971) identified a response of stock prices to world events as measured by newspaper headlines. In addition, Lloyd-Davies and Caves (1978) concluded that individual stocks react immediately to *Wall Street Journal* recommendations.

Pearce and Roley (1985) extended their original study by including measures of inflation, real activity announcements and anticipated money announcements, concluding that (i) money announcement surprises have a significantly negative effect on stock prices; (ii) discount rates also have a significant impact on stock prices; and (iii) little evidence supports the effects of inflation and real economic activity on stock prices. Furthermore, the study found that the anticipated components of economic announcements did not significantly affect daily stock prices, a finding that is consistent with the efficient market hypothesis. The impact of the money supply was examined by Grossman (1981), Urich and Wachtel (1981), Roley (1983), Cornell (1983) and Pearce and Roley (1983). The general finding is that unanticipated money stock announcements are associated with higher interest rates and, consequently, lower stock prices.

Recent studies have also dealt with the effect of macroeconomic announcements on stock prices. Arshanapalli (2006) found stock and bond prices to be more volatile on days of macroeconomic announcements. Nofsinger and Prucyk (2003) found support for the impact of macroeconomic news on the volume and volatility of the S&P 100 stock index options, with most of the high volume and volatility coming from announcements considered bad news. Thorbecke (1997) found that expansionary policy increased ex-post stock returns, whereas Bernanke and Kuttner (2005) concluded that the effects of unanticipated monetary policy actions on expected excess returns account for the largest part of the response of stock prices. Pre-announcement and monetary policy news effects on the stock market have been examined by Bomfim (2003), who found that stock market volatility was abnormally low. However, results attributed to the Federal Reserve's disclosure practices of the period 1998-2003 was statistically significant.

A study by Chang and Rhee (1986) examined the impact of the producer price index and the consumer price index on the daily returns of the New York Stock Exchange composite portfolio. By employing the ARIMA methodology on Fama's (1975) Treasury bill model for the estimation of expected and unexpected rates of inflation, they showed that stock market reaction was more sensitive to CPI announcements than to PPI announcements. The study also indicated that the PPI unexpected inflation has a negative effect on daily stock returns.

News on company announcements have been studied extensively. In primary markets, Bonomo et al (1995) investigated the Dow Jones News Wire (DJNW) announcements that differ in timing from primary equity offering registration and its impact on market responses. The stock price reaction proved greater from mention on the DJNW than at registration. Masulis and Shivakumar (2002) found that price adjustments to seasoned equity offerings by NASDFAQ stocks were one hour quicker than stocks on NYSE/AMEX. Arbel and Swanson (1993) found that price adjustment to stock-split announcements was greater for "information-rich" stocks than for "information-poor" stocks. Burton et al. (2000) confirmed, by studying 116 announcements on both U.K. and U.S. markets, that new equity announcements had a negative impact on stock prices.

Also important are announcements of changes in company structure, including the effects of mergers and acquisitions. Barnes (1984) examined post-merger stock price performance, concluding that merger news was generally considered as "good news". He also documented significant price drops in the longer term. Sun and Tang (2000) confirmed the effect of railroad merger announcements. In acquisitions, Norris and Ayres (2000) examined the extent to which increases in goodwill were negatively associated with the acquirer's stock price.

The impact of corporate investment announcements on stock prices was investigated by Brio et al. (2003), who applied a cross-sectional analysis on the Spanish capital markets and found that information was impounded in prices five days before its release. They attributed the results to the presence of private information. Hotchkiss and Strickland (2003) emphasized the effects of shareholder composition, confirming that the composition of institutional investors affects stock price behavior.

Dividend announcements have been studied by Benesh et al. (1984), who examined market reaction to shifts in dividend policy. The results indicated a downward impact on stock prices when dividend omissions or large decreases were announced. Recently, the effects of dividend announcements were investigated by Gurgul et al. (2006), who found that, on average, prices move in the same direction as dividends in the German stock market. They also found that volume exhibited significant increases around dividend announcement dates. In a study conducted on U.K. firms, Gunasekarage and Power (2006) also found that stock returns tend to be positive when companies increase dividends.

Fraudulent financial reporting and its impact on capital markets was explored by Cox and Weirich (2002). The study found a significant negative announcement effect on the day before and on the day of a news event. Kanto and Schadewitz (1997) studied the impact of earnings and disclosure in interim reports on the Helsinki Stock Exchange. They found that the higher the disclosure the stronger the effect of earnings announcements and vice versa. Gunderson et al. (1997) found a strong negative relation between a firm layoff announcements and its stock price.

Some studies have been conducted on emerging markets. Hayo and Kutan (2005) measured the effect of IMF events on the volatility of six emerging stock markets, examining events during the Asian, Russian and Brazilian crises of 1997-1999. The study found that negative and positive IMF news reduced and increased daily stock returns respectively by about one percentage point. No significant impact, however, was found on the bond market. In Malaysia, Hamid and Hamid (2005) examined the effect of a firm's capital increase announcement on the stock performance of insurance companies. The results indicate no significant relation between abnormal returns and the date of announcements. The Malaysian market was also tested for the effect of acquisition announcements on security prices by Fauzias (1993), who obtained results indicating that corporate takeovers were considered good news for the shareholders of target firms. Tan and Hooy (2004) evaluated the effects of the Malaysian bank merger program on the volatility of the Malaysian bank stock returns. The results showed that the proposed merger did bring about stability for the banks' stock prices.

So, the available empirical evidence is mixed, to say the least. Copeland (1994, p 359) concludes that no combination of news variables has yet come anywhere near explaining financial volatility, referring in particular to the foreign exchange market. Some economists view this conclusion as disappointing, because the news model was originally advocated as an explanation (and rationalisation) of turbulence in financial markets. He also refers to "unsatisfactory results", particularly the residual serial correlation reported in the empirical studies of the news model. Copeland further argues that "new information cannot be the

whole story", which is evident by comparing financial volatility during the opening and closing hours of the market.

The Model and Methodology

Suppose that stock prices, as represented by a market index, are determined by the linear relation

$$s_t = \sum_{i=1}^{n} \alpha_i z_{it} \qquad (1)$$

Where *s* represents stock prices and *z* is a vector of explanatory variables. By applying the rational expectations operator, we obtain

$$E_{t-1} s_t = \sum_{t=1}^{n} \alpha_i E_{t-1} z_{it} \qquad (2)$$

such that

$$E_{t-1} s_t = E(s_t \mid \Omega_{t-1}) \qquad (3)$$

where Ω_{t-1} is the information set available at time $t-1$, on the basis of which expectation is formed. By subtracting equation (1) from equation (2) we obtain

$$s_t - E_{t-1} s_t = \sum_{i=1}^{n} \alpha_i \left(z_{it} - E_{t-1} z_{it} \right) \qquad (4)$$

To estimate equation (4), one must first choose the *z* variables and then decide how the news components are extracted. In this paper the *z* variables are taken to be government spending, *g*, the money supply, *m*, the general price level, *p*, government revenue, *r*, and the interest rate, *i*.[1] The justification for the choice of these variables in the case under investigation is straightforward. Starting with government revenue and spending, these are important determinants of economic activity and personal income in an economy that is dominated by public sector activity financed by revenue from oil sales. Fluctuations in economic activity affect stock prices because the latter reflect investors' expectations about corporate performance in terms of earnings and cash flows, as well as the required rate of return (the discount rate). All of these variables are affected by the level of economic activity, and the effect can work indirectly via interest rates. The available empirical evidence indicates that there is a strong positive relation between stock prices and economic activity.

The effect of the money supply on stock prices has been studied extensively. Apart from the indirect effect of changes in the money supply (via interest rates), a monetary expansion may have a direct effect that leads to portfolio adjustment, producing increased demand for stocks (for example, Cooper, 1974; Rozeff, 1974). In general, if the money supply grows faster than the GDP, this implies the existence of excess liquidity that can be used to buy stocks.

[1] This is not an exhaustive list of the variables that affect the Kuwait stock market. We must also mention that external factors and the behavior of other regional markets are also important. For example, Moosa and Al-Deehani (2007) examined interdependence among the stock markets of Bahrain, Kuwait and Saudi Arabia using a variety of testing techniques involving symmetric and asymmetric autoregressive distributed lag models. The results revealed the absence of long-run relationships among these markets, which is consistent with the notion of cross-sectional efficiency. However, strong evidence was found for short-run dynamic interdependence, particularly if the underlying model allows for asymmetric responses of returns in one market to changes in the returns in the other markets. Likewise, Al-Deehani and Moosa (2006) found volatility spillover among the same stock markets with the Kuwait market playing the major role. See also Dahel and Laabas for a study of the GCC markets.

Furthermore, monetary policy may work through the ability and willingness of banks to offer credit on easy terms. Through this effect, a contractionary monetary policy adversely affects the tendency to buy stocks. If changes in the money supply affect real variables, they will have lagged influence on stock prices (for example, Rogalski and Vinso, 1977). Another indirect channel of causation is inflation, as monetary policy invariably targets inflation.

The relation between stock prices and the general price level (or the inflation rate) has been examined in the literature on the Fisher hypothesis as applied to stock markets. The effect of inflation on stock prices is ambiguous (see, for example, Day, 1984; Fama and Schwert, 1977; Gultekin, 1983; Cochran and DeFina, 1993). This effect is typically discussed with reference to stocks as a hedge against inflation. For stocks to perform this function effectively, stock prices must increase sufficiently to compensate investors for any erosion in the purchasing power of money. The consensus view is that stocks provide an excellent long-term hedge, but they fail miserably in the short run. Since stocks are claims on the earnings of real assets, it is reasonable to expect inflation to affect real stock returns. Although stocks survive inflation over long periods of time, they represent a poor short-term hedge against inflation. This means that inflation affects stock prices negatively in the short run, but not in the long run.

Finally, interest rates are thought to have a negative effect on stock prices for the following reasons that reflect the channels of causation or transmission mechanism:

1. The discount rate used in the dividend discount model is some sort of interest rate. The higher the discount rate, the lower will be the present value of future dividends and the lower will be the value of the underlying stock.
2. The interest rate is also the cost of funding the acquisition of stocks. The higher the cost of funding, the lower will be the tendency to buy stocks.
3. Long-term interest rates are bond yields. Since bonds provide an alternative investment vehicle to stocks, higher bond yields (interest rates) curb the tendency to buy stocks and depress their prices.
4. Higher interest rates may be interpreted as being a sign of contractionary monetary policy. Monetary contraction affects stock prices adversely.
5. The effect of monetary policy may work through interest rates. Through the liquidity effect, a monetary expansion leads to lower interest rates and hence high stock prices.

Equation (4) can be specified more explicitly as

$$s_t - E_{t-1}s_t = \alpha_0 + \alpha_1(g_t - E_{t-1}g_t) + \alpha_2(m_t - E_{t-1}m_t) + \alpha_3(p_t - E_{t-1}p_t)$$
$$+ \alpha_4(r_t - E_{t-1}r_t) + \alpha_5(i_t - E_{t-1}i_t) + \varepsilon_t \qquad (5)$$

where all variables are measured in logarithms except the interest rate. The expected signs should be $\alpha_1 > 0$, $\alpha_2 > 0$, $\alpha_3 \neq 0$, $\alpha_4 > 0$ and $\alpha_5 < 0$.

The next question is how to derive the news components? Three methods are used for this purpose, ARMA models, VAR models and the HP filter. The reason for using more than one method to extract the news components is testing robustness: to find out if the results are indifferent to the method of extracting the news components. In the case of ARMA and VAR models, the news components are taken to be the residuals of the fitted models. The ARMA and VAR models can be written as

$$y_t = \beta_0 + \sum_{i=1}^{p} \beta_i y_{t-i} + \sum_{i=1}^{q} \gamma_i \varepsilon_{t-i} + \varepsilon_t \qquad (6)$$

$$y_{jt} = \beta_0 + \sum_{i=1}^{m} \beta_{ji} y_{jt-i} + \sum_{k \neq j}^{n} \sum_{i=1}^{m} \beta_{ki} y_{kt-i} + \xi_t \quad (7)$$

where p is the order of the autoregressive process, q is the order of the moving average process, m is the order of the VAR and n is the number of variables in the VAR (six in this case). Thus, the news components are taken to be the estimated values of the residuals ε and ξ.

The Hodrick-Prescott (1997) filter (HP filter) is a detrending technique used to decompose an observed time series into a trend and cycle. Formally, the HP filter is used to estimate the trend path $\{y_t^*, t = 1,2,\cdots,n\}$ of a time series $\{y_t, t = 1,2,\cdots,n\}$, subject to the constraint that the sum of the squared second differences of the time series is not too large. The trend is calculated from the observed time series by solving the optimization problem

$$\min_{y_1^*, y_2^*, \cdots y_n^*} \left\{ \sum_{t=1}^{n} (y_t - y_t^*)^2 + \lambda \sum_{t=2}^{n-1} (\Delta y_{t+1}^*)^2 \right\} \quad (8)$$

where the smoothing parameter, λ, is normally determined by the frequency of the observations. In this case, the news components are the deviations from the fitted HP trends.

Following the estimation of the basic news model (5), it may be interesting to test this model against an alternative model that does not distinguish between the anticipated and unanticipated components of the variables. For this purpose the basic news model is modified by specifying the explanatory variable to be the first log difference of stock prices. This model can be written as

$$\Delta s_t = \alpha_0 + \alpha_1 (g_t - E_{t-1} g_t) + \alpha_2 (m_t - E_{t-1} m_t) + \alpha_3 (p_t - E_{t-1} p_t) \quad (9)$$

The modified news model is then tested against the first difference model

$$\Delta s_t = \beta_0 + \beta_1 \Delta g_t + \beta_2 \Delta m_t + \beta_3 \Delta p_t + \beta_4 \Delta r_t + \beta_5 \Delta i_t + \xi_t \quad (10)$$

For the purpose of testing equation (9) against equation (10) six non-nested model selection tests and two information criteria are used. The non-nested model selection tests are as follows: *N* is the Cox test derived in Pesaran (1974); *NT* is the adjusted Cox test derived in Godfrey and Pesaran (1983); *W* is the Wald-type test proposed by Godfrey and Pesaran (1983); *J* is the Davidson and MacKinnon (1981) test; *JA* is the Fisher-McAleer (1981) test; and *EN* is the encompassing test proposed, *inter alia*, by Mizon and Richard (1986). All of the test statistics have a t distribution, except for the encompassing test statistic that has an F distribution. Moreover, the Akaike information criterion (AIC) and the Schwarz Bayesian criterion (BIC) are used for the same purpose. In this case, what matters is whether the AIC or BIC have positive or negative values. A description of these tests and information criteria can be found in Pesaran and Pesaran (1997).

The non-nested model selection tests are applied to M1 and M2, as represented by equations (9) and (10), respectively. The tests are run both ways by testing M1 versus M2 and M2 versus M1. When M1 is tested versus M2, the null hypothesis is that M1 is a better model (in terms of specification) than M2. A significant test statistic indicates that M1 is not a better model than M2. When M2 is tested against M1, the null is that M2 is a better a model than M1. A significant test statistic indicates that M2 is not a better model than M1. If we get

significant test statistics both ways, this means that both of the models are mispecified. If we get insignificant test statistics by testing M1 versus M2 and significant statistics by testing M2 versus M1, this means that M1 is preferred to M2, and vice versa.

The final step in the empirical analysis is to find out if a dynamic version of the news model (5) works better than the static version, or if the news components have a lagged effect on stock prices. For this purpose, an ARDL version of equation (5) is estimated, which can be written as

$$s_t - E_{t-1}s_t = \alpha_0 + \sum_{j=1}^{k}\alpha_{1j}(s_{t-j} - E_{t-j-1}s_{t-j})\sum_{j=0}^{k}\alpha_{2j}(g_{t-j} - E_{t-j-1}g_{t-j}) + \sum_{j=0}^{k}\alpha_{3j}(m_{t-j} - E_{t-j-1}m_{t-j})$$
$$+ \sum_{j=1}^{k}\alpha_{4j}(p_{t-j} - E_{t-j-1}p_{t-j})\sum_{j=0}^{k}\alpha_{5j}(r_{t-j} - E_{t-j-1}r_{t-j}) + \sum_{j=0}^{k}\alpha_{6j}(i_{t-j} - E_{t-j-1}i_{t-j}) \qquad (11)$$

Equation (11) will be compared with equation (5) on the basis of the best fit and diagnostics. Estimating a dynamic version of the news model gives us an idea of the speed at which the effect of news is reflected on prices, providing some evidence on market efficiency.

Data and Empirical Results

The empirical results presented in this paper are based on a sample of monthly observations covering the period January 1996-December 2004. Stock prices are represented by the Kuwait Stock Exchange index.[2] Government spending and revenue are measured in million Kuwaiti dinars at monthly rates. The money supply is M2, measured in million Kuwaiti dinars. The interest rate is the one month interest rate on Kuwaiti dinar deposits. Data on the stock price index were obtained from the Kuwait Stock Exchange, whereas data on the other variables were obtained from the IFS CD-ROM (International Monetary Fund).

The starting point is to report the estimated ARMA models used to extract the news components, all of which turned out to be ARMA(2,2). These results are reported in Table 1. All of the models (except for government spending) seem to be well determined in terms of the best fit, but in some models the coefficients on the moving average terms are insignificant. All of the models are free of serial correlation as judged by the DW statistic, in which case the ARMA models provide a reasonable means for extracting the news components. The estimated VAR models are reported only in terms of the best fit and the diagnostics for serial correlation, *SC*, functional form, *FF*, and heteroscedasticity, *HS*, as shown in Table 2. The diagnostic test statistics have a χ^2 distribution with 12, 1 and 1 degrees of freedom, respectively. The VAR models are reasonably well determined, except for the comparatively low R^2 for the equation in which the dependent variable is *g*.

Table 3 presents the estimated news models corresponding to the three methods used to extract the news components. All of the models pass all of the diagnostic tests, in which case it is valid to derive inference from them. Only two news variables are statistically significant in at least two of the models, those of the money supply and government revenue. The interest rate news term appears significant but incorrectly signed in one of the models. It is not difficult to explain why unanticipated movements in the money supply affect stock prices, as movements in the money supply reflect movements in the volume of credit facilities used to finance the acquisition of stocks. Likewise, an unanticipated rise in government reverence

[2] The Kuwait Stock Exchange index is calculated as $I = M / N\sum[(P_t / P_0)C]$, where *I* is the index, *M* is the multiplier (=1000), *N* is the number of shares (all listed shares), P_t is the price at time t, P_0 is the base price (on 29 December 1993) and *C* is a factor used to adjust stock prices for dividends and bonus shares.

gives the impression that the government will be in a better financial position to support the market should a collapse occur, as what happened in the past.

The next step in this empirical analysis is non-nested model selection tests, whose results are reported in Table 4. When the news components are extracted from the ARMA models, M1 is preferred by two tests, whereas M2 is preferred by one test. When VAR extraction is used, M1 is preferred by two tests, whereas M2 is preferred by none. And when the HP filter is used to extract the news components, M1 is preferred by five tests. As for the information criteria, a positive number implies that M1 is preferred to M2, which is what we have irrespective of how the news components are extracted. Hence, the overwhelming evidence is in favor of the news model as opposed to the straight first difference model.

Table 5 reports the dynamic news models where the optimal lag lengths are determined by the Schwarz Bayesian information criterion. As we can see, there is limited dynamics, in fact no dynamics at all when the news components are extracted from the VAR models. These results provide some evidence for market efficiency, in the sense that the effect of news is reflected on stock prices with little delay. However, the dynamic models produce some evidence on the negative effect of interest rates on stock prices.

The Reaction of Stock Prices to Media News

Moosa (2002) argues that the effect of news on financial prices is theoretically and intuitively plausible, attributing the failure of empirical studies of the new model to produce consistently supportive results to flaws in the econometric methods used to extract the news components. Arguing against the plausibility of representing news by the empirical residuals of ARMA and VAR models, Moosa suggests that the effect of news on financial prices should be examined by using some sort of event studies. This can be done by taking news items, relating them to prior expectations and checking if the price moves as predicted by theory or intuition. This is what we aim to do in this section to supplement, or compare with, the econometric results.

Figure 1 displays the reaction of the KSE market index to selected, predominantly non-economic events, including the 2000 increase in OPEC's oil production, the 2000 U.S. elections, the September 11 attacks, the invasion of Iraq in 2003 and the capture of Saddam Hussein in December 2003. We can see very clearly that stock prices fell on the September 11 attacks and rose on the days of the invasion of Iraq and the capture of Saddam Hussein. These events are pure news in an economic sense, since they were unanticipated (at least, the timing in the case of the invasion of Iraq). Figure 2 shows the reaction of the KSE market index to changes in the discount rate, which can be more clearly seen by examining Table 6.

Table 6 lists, in a chronological order, some economic and non-economic events and the reaction of the KSE market index on the day of announcement (T = 0) as well as the following three or four days (T = +1, T = +2, T = +3 and T = +4). The table shows very clearly that stock prices react to these announcements, positively or negatively, but it is impossible to glean any knowledge of the effect of news (defined as deviations from expectations) without having an idea about what had been anticipated prior to these announcements. This can be done with the help of a survey if the views of market participants and observers (or the public at large), an exercise that is rarely conducted in Kuwait. But it still remains intuitively plausible that what matters is announcement relative to anticipation rather than the mere announcement. It is relativity after all.

Conclusion

Theory and intuition tell us that news does matter. If market participants expect something to happen, it will be reflected in the price immediately, in which case only the unexpected change will cause prices to move. For example, if there is an expectation that the interest rate will be raised by 50 basis points, the price will adjust immediately (downwards, according to economic theory). If this materializes, nothing will happen to the price, because it has already adjusted. If, however, the interest rate rises by 75 basis points, the price will decline because of the unanticipated 25 basis point rise. This proposition has a highly intuitive appeal.

This study presented econometric evidence of the effect of news, defined as unanticipated changes in macroeconomic variables, on stock prices measured by the Kuwait Stock Exchange index. The results revealed that the news items associated with the money supply and government revenue are important, a finding that has a straightforward explanation. Unanticipated changes in the money supply are a reflection of unanticipated changes in credit, a significant part of which is used to finance the acquisition of stocks. Unanticipated changes in government revenue (resulting from higher oil prices, for example) gives market participants the feeling that the government will be in a better financial position to rescue the market, should something go wrong. Some evidence, albeit weaker, was found for a negative effect of the unanticipated component of the interest rate. By and large, the results revealed little dynamics in the model, implying that prices adjust quickly to news.

To reconcile the intuitive appeal of the news model and the not-too-strong empirical results, it is argued that there is a problem with the econometric measurement of unanticipated changes in the macroeconomic variables as the empirical residuals of ARMA or VAR models or as the deviations from an HPF trend. The importance of news is better judged by considering events of announcements relative to what had been anticipated. This paper showed, by going through some chronology of events, that stock prices do react positively or negatively to announcements about economic and non-economic factors. However, in the absence of any measure of expectation prior to the announcement, it is impossible to get a feel of the news. Therefore, it remains true that the news argument makes a lot of sense.

References

Al-Deehani, T. and Moosa, I.A. (2006) Volatility Spillover in Regional Emerging Stock Markets: A Structural Time Series Approach, *Emerging Markets Finance and Trade*, 42, 78-89.

Arbel, A. and Swanson, G. (1993) The Role of Information in Stock Split Announcement Effects, *Quarterly Journal of Business and Economics*, 32, 14-26.

Arshanapalli, B., d'Ouville, E., Fabozzi, F. and Switzer, L., (2006) Macroeconomic News Effects on Conditional Volatilities in the Bond and Stock Markets, *Applied Financial Economics,* 16, 377-393.

Barnes, P. (1984) The Effect of a Merger on the Share Price of the Attacker, Revisited, *Accounting and Business Research*, 15, 49-50.

Benesh, G., Keown, A. and Pinkerton, J. (1984) An Examination of Market Reaction to Substantial Shifts in Dividend Policy, *Journal of Financial Research*, 7, 131-143.

Bernanke, B. and Kuttner, K. (2005) What Explains the Stock Market's Reaction to Federal Reserve Policy? *Journal of Finance*, 60, 1221-1257.

Bomfim, A. (2003) Pre-announcement Effects, News Effects, and Volatility: Monetary Policy and the Stock Market, *Journal of Banking and Finance*, 27, 133-151.

Bonomo, V., Johnson, D., and Thomspson, R. (1995) The Impact of the Source and Sequence of Information in Primary Equity Offerings, *The Financial Review*, 31, 1-23.

Brio, E., Perote, J. and Pindado, J. (2003) Measuring the Impact of Corporate Investment Announcements on Share Prices, *Journal of Business Finance and Accounting*, 30, 715-748.

Burton, B., Lonie, A. and Power, D. (2000) The Impact of Corporate Growth Opportunities on the Market Response to New Equity Announcements, *Applied Financial Economics*, 10, 27-36.

Castanias, R.P. (1979) Macroinformation and the Variability of Stock Market Prices, *Journal of Finance*, 34, 5-22.

Chang, R. and Rhee, G. (1986) Does the Stock Market React to Announcements of the Producer Price Index? *The Financial Review*, 21, 1, 125-135.

Cochran, S. and DeFina, R. (1993) Inflation's Negative Effects on Real Stock Prices: New Evidence and a Test of the Proxy Hypothesis, *Applied Economics*, 25, 263-274.

Cooper, R. (1974) Efficient Capital Markets and the Quantity Theory of Money, *Journal of Finance*, 24, 887-921.

Copeland, L.S. (1994) *Exchange Rates and International Finance*, Workingham: Addison-Wesley.

Cornell, B. (1983), Money Supply Announcements and Interest Rates: Another View, *Journal of Business*, 56, 1-23.

Cox, R. and Weirich, T. (2002) The Stock Market Reaction to Fraudulent Financial Reporting, *Managerial Auditing*, 17, 374-383.

Dahel, R. and Laabas, B. (1999) The Behavior of Stock Prices in the GCC Markets, *Journal of Development and Economic Policies*, 2, 89-105.

Davidson, R. and Mackinnon, J.G. (1981) Several Tests for Models Specification in the Presence of Alternative Hypotheses, *Econometrica*, 49, 781-793.

Day, T. (1984) Real Stock Returns and Inflation, *Journal of Finance*, 39, 493-502.

Fama, E. (1975) Short Term Interest Rates as Predictors of Inflation, *American Economic Review*, 65, 269-282.

Fama, E. and Schwert, G. (1977) Asset Returns and Inflation, *Journal of Financial Economics*, 5, 115-146.

Fama, E. F., Fisher, L., Jensen, M. and Roll, R. (1969), The Adjustment of Stock Prices to New Information, *International Economic Review*, 10, 1-21.

Fauzias, M. (1993) The Effect of Acquisition Announcement on the Security Prices of Bidding and Target Firm: The Malaysian Experience, *IBAR*, 14, 114-127.

Fisher, G.R. and McAleer, M. (1981) Alternative Procedures and Associated Tests of Significance for Non-Nested Hypotheses, *Journal of Econometrics*, 16, 103-119.

Godfrey, L.G. and Pesaran, M.H. (1983) Tests of Non-Nested Regression Models: Small Sample Adjustments and Monte Carlo Evidence, *Journal of Econometrics*, 21, 133-154.

Grossman, J. (1981), The Rationality of Money Supply Expectations and the Short-Run Response of Interest Rates to Monetary Surprises, *Journal of Money, Credit and Banking*, 13, 409-424.

Gultekin, N. (1983) Stock Market Returns and Inflation: Evidence from Other Countries, *Journal of Finance*, 38, 49-65.

Gunasekarage, A. and Power, D. (2006) Anomalous Evidence in Dividend Announcements Effect, *Managerial Finance*, 32, 209-227.

Gunderson, M., Verma, A., and Verma, S. (1997) Impact of Layoff Announcements on the Market Value of the Firm, *Relations Industrielles*, 52, 364-382.

Gurgul, H., Majdosz, P. and Mestel, R. (2006), Implications of Dividend Announcements for Stock Prices and Trading Volume of DAX Companies, *Finance a Uver*, 56, 58-71.

Hamid, A. and Hamid, A. (2005) The Announcement Effect on the Increase of Paid Up Capital on Stock Performance of Insurance Companies in Malaysia, *Journal of American Academy of Business*, 6, 208-214.

Hayo, B., Kutan, A. (2005) IMF-related News and Emerging Financial Markets, *Journal of International Money and Finance*, 24, 1126-1142.

Hodrick, R. and Prescott E. (1997) Post-War U.S. Business Cycles: An Empirical Investigation, *Journal of Money, Credit and Banking*, 29, 1-16.

Hotchkiss, E. and Strickland, D. (2003) Does Shareholder Composition Matter? Evidence from the Market Reaction to Corporate Earnings Announcements, *Journal of Finance*, 58, 1469-1499.

Kanto, A. and Schadewitz, H. (1997) Effects of Earnings and Disclosure on Stock Market Behavior Around Interim Report Announcement, *International Journal of Management*, 14, 422-432.

Kim, O. and Verrecchia, R. (1991) Trading Volume and Price Reactions to Public Announcements, *Journal of Accounting Research*, 29, 302-321.

Lloyd-Davies, P., and Caves, M. (1978) Stock Prices and the Publication of Second-hand Information, *Journal of Business*, 51, 43-56.

Masulis, R. and Shivakumar, L. (2002) Does Market Structure Affect the Immediacy of Stock Price Reponses to News? *Journal of Financial and Quantitative Analysis*, 37, 617-649.

Mizon, G.E. and Richard, J.F. (1986) The Encompassing Principle and its Application to Non-Nested Hypotheses, *Econometrica*, 54, 657-678.

Moosa, I.A. (2002) A Test of the News Model of Exchange Rates, *Weltwirtschaftliches Archiv*, 138, 694-710.

Moosa, I.A. and Al-Deehani, T. (2007) Interdependence of Regional Emerging Stock Markets: The Experience of Three GCC Countries, *International Journal of Economic Research* (forthcoming).

Niederhoffer, V. (1971), The Analysis of World Events and Stock Prices, *Journal of Business*, 44, 193-219.

Nofsinger, J. and Prucyk, B. (2003) Option Volume and Volatility Response to Scheduled Economic News Releases, *Journal of Futures Markets*, 23, 315-345.

Norris, K. and Ayres, F. (2000) Security Market Reaction to Purchase Business Combinations at the First Earnings Announcement Date, *Journal of Business Research*, 49, 79-88.

Pearce, D. and Roley, V.V. (1985) Stock Price and Economic News, *Journal of Business*, 58, 49-67.

Pearce, D.K. and Roley, V.V. (1983), The Reaction of Stock Prices to Unanticipated Changes in Money: A Note, *Journal of Finance*, 38, 1323-1333.

Pesaran, M.H. (1974) On the General Problem of Model Selection, *Review of Economic Studies*, 41, 153-171.

Pesaran, M.H. and Pesaran, B. (1997) *Working with Microfit 4.0: Interactive Econometric Analysis*, Oxford: Oxford University Press.

Rogalski, R. and Vinso, J. (1977) Stock Returns, Money Supply and the Direction of Causality, *Journal of Finance*, 32, 1017-1030.

Roley, V.V (1983) The Response of Short-term Interest Rates to Weekly Money Announcements, *Journal of Money, Credit and Banking*, 15, 344-354.

Rozeff, M. (1974) Money and Stock Prices: Market Efficiency and the Lag Effect of Monetary Policy, *Journal of Financial Economics*, 1, 245-302.

Schwert, G. W. (1981) The Adjustment of Stock Prices to Information About Inflation, *Journal of Finance*, 36, 15-29.

Sun, H. and Tang, A. (2000) The Sources of Railroad Merger Gains: Evidence from Stock Price Reaction and Operating Performance, *Transportation Journal*, 39, 14-27.

Tan, H. and Hooy, C. (2004) Bank Merger and Bank Stock Volatility: A Post-Announcement Analysis, *Managerial Finance*, 30, 29-48.

Thorbecke, W. (1997) On Stock Market Returns and Monetary Policy, *Journal of Finance,* 52, 635-654.

Urich, T. and Wachtel, P. (1981) Market Response to the Weekly Money Supply Announcements in the 1970s, *Journal of Finance*, 36, 1063-1072.

Waud, R. (1970) Public Interpretation of Federal Reserve Discount Rate Changes: Evidence on the "Announcement Effect". *Econometrica*, 38, 231-250.

Figure 1: The Reaction of the KSE Index to Selected Non-Economic Major Events

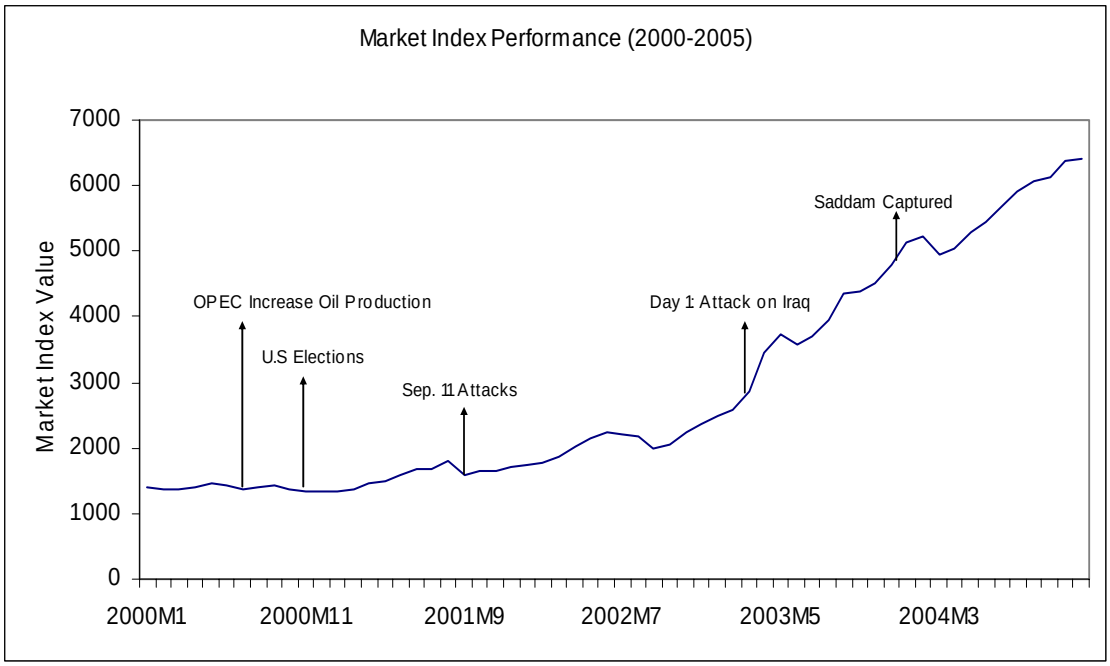

Figure 2: The Reaction of the KSE Index to Changes in the Discount Rate (vertical lines indicate dates of change)

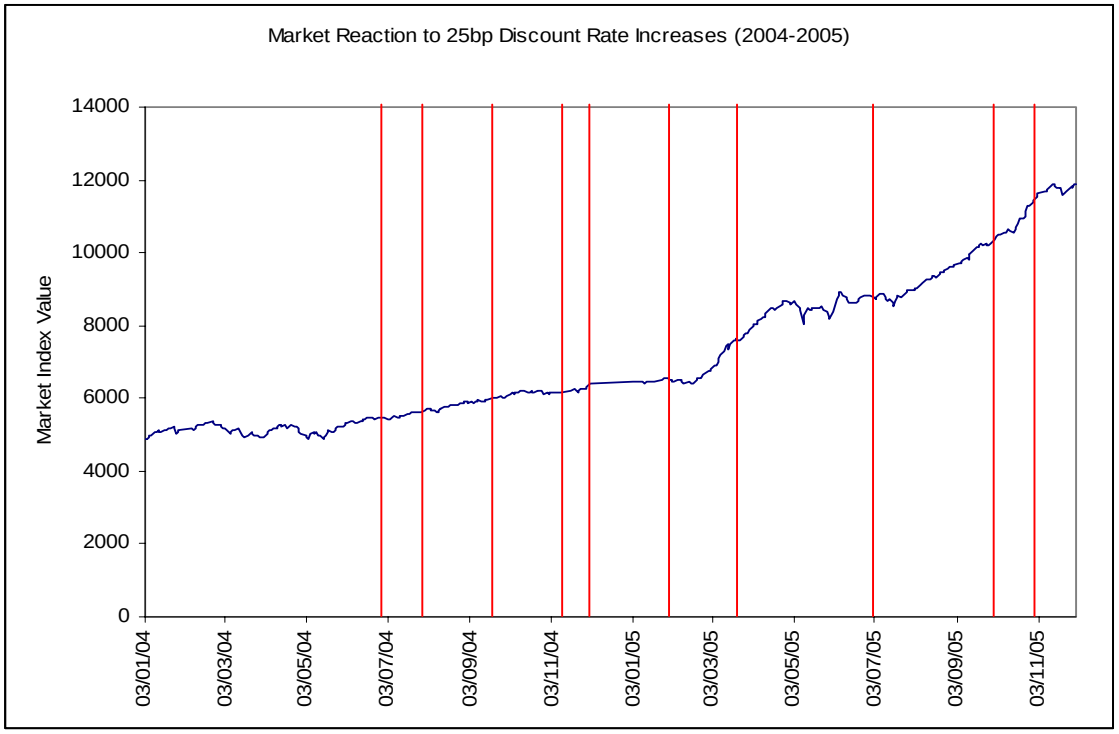

Table 1: The Estimated ARMA Models

	s	*g*	*m*	*p*	*r*	*i*
β_0	0.0192	1.4875	-0.0099	0.0096	0.2816	0.0145
	(1.11)	(2.07)	(-0.13)	(0.22)	(1.13)	(0.65)
β_1	1.9673	0.8696	1.2696	0.6429	0.6418	1.7365
	(762.62)	(1.80)	(4.41)	(0.41)	(2.59)	(13.57)
β_2	-0.9698	-0.1338	-0.2674	0.3553	0.31283	-0.7409
	(-245.93)	(-0.32)	(-0.92)	(0.22)	(1.33)	(-5.81)
γ_1	-0.5919	-0.6075	-0.4716	-0.0187	0.2482	-0.1535
	(-6.52)	(-1.27)	(-1.64)	(-0.12)	(1.04)	(-0.97)
γ_2	-2.8315	0.2844	0.2025	-0.132	-0.2558	0.0691
	(-2.83)	(0.98)	(1.29)	(-0.234)	(-2.70)	(0.54)
R^2	0.99	0.29	0.98	0.97	0.87	0.99
DW	2.01	1.93	1.96	1.98	1.97	2.00

Table 2: The Best Fit and Diagnostics of the Estimated VAR Models

	s	*g*	*m*	*p*	*r*	*i*
R^2	0.99	0.38	0.98	0.98	0.92	0.98
DW	2.06	1.96	2.18	2.01	1.92	1.99
SC	13.94	20.70	20.51	18.46	13.35	11.25
FF	2.11	1.50	2.64	3.08	5.39	0.18
HS	0.13	2.29	0.33	1.86	0.42	0.48

Table 3: The Estimated News Models

	ARMA	VAR	HPF
α_0	0.0004	0.0000	0.0080
	(0.10)	(0.00)	(0.82)
α_1	-0.0023	0.0003	-0.0455
	(-0.17)	(0.03)	(-1.61)
α_2	0.20444	0.2821	0.8319
	(2.03)	(-1.28)	(4.49)
α_3	-0.7829	-0.7181	-4.6760
	(-1.18)	(-1.28)	(-3.37)
α_4	0.0689	0.0984	0.0479
	(2.12)	(3.06)	(0.89)
α_5	0.0645	0.1280	-0.0144
	(1.10)	(2.42)	(-0.44)
R^2	0.09	0.23	0.31
DW	2.11	1.91	0.38
SC	18.36	11.77	14.12
FF	0.01	0.74	1.83
HS	0.36	0.03	2.62

Table 4: Non-Nested Model Selection Tests and Information Criteria

	M1 vs M2	M2 vs M1
ARMA		
N	1.33	-4.44*
NT	1.35	1.74
W	1.38	-1.70
J	-0.43	3.31*
JA	-2.41*	1.11
EN	3.78*	4.88*
AIC	2.49#	
BIC	2.49#	
VAR		
N	0.65	-3.61*
NT	1.02	-1.58
W	1.04	-1.53
J	0.55	3.47*
JA	-1.80	0.98
EN	1.42	2.63*
AIC	3.05#	
BIC	3.05#	
HPF		
N	-1.32	-10.78*
NT	-0.95	-4.51*
W	-0.95	-4.17*
J	1.64	4.47*
JA	0.08	1.86
EN	1.08	4.19*
AIC	7.63#	
BIC	7.63#	

* Significant at the 5% level. # Favors M1.

Table 5: The Estimated ARDL News Models

	ARMA	VAR	HPF
α_0	0.0002	-0.0002	0.0023
	(0.05)	(-0.6)	(0.58)
α_{11}			0.8577
			(22.47)
α_{12}			
α_{20}	-0.0019	-0.0007	-0.0076
	(-0.16)	(-0.7)	(-0.66)
α_{21}			
α_{22}			
α_{30}	0.1842	0.2760	0.1946
	(-1.32)	(2.94)	(2.44)
α_{31}			
α_{32}			
α_{40}	-0.8267	-0.7558	-0.7075
	(2.59)	(-1.34)	(-1.21)
α_{41}			
α_{42}			
α_{50}	0.0808	0.1003	0.0576
	(2.65)	(3.07)	(2.67)
α_{51}	0.0844		
	(0.77)		
α_{52}			
α_{60}	0.0430	0.1285	-0.3020
	(0.77)	(2.40)	(-2.31)
α_{61}	-0.1743		
	(-3.29)		
α_{62}			
R^2	0.22	0.23	0.89
DW	2.11	1.91	1.82
SC	12.11	11.01	18.01
FF	0.37	0.61	1.65
HS	0.34	0.03	0.20

Table 6: The Reaction of the KSE Index to Media News Announcements

Date	Type of Announcement	Event/Announcement	T=0	T+1	T+2	T+3	T+4
12/07/00	Political	Kuwait ratifies treaty with KSA resolving claims to offshore mineral rights	1384.4	1388.1	1387.5	1391.3	
21/07/00	Energy	OPEC agrees to raise crude oil production	1385	1387.1	1383.2	1394.1	
10/09/00	Energy	OPEC agrees to raise crude oil production	1451.9	1461.9	1452.2	1449.8	
28/09/00	Political	UN Compensation Committee approves Kuwait's $15.9 billion claim for compensation	1441.1	closed	1444.2	1431.2	
07/11/00	Political	George W. Bush announced U.S President	1372	1368.8	1367.5	1365.2	
17/01/01	Energy	OPEC agrees to reduce production	1321.5	1321.9	1319.9	1323.5	
11/09/01	Attack	September 11th Attack on the U.S	1759.2	1772.8	1690.1	1626.8	
03/06/02	Macro	CBK reduces discount rate 50 bp to 3.75%	2191.6	2202.6	2178.5	2190	2206.7
07/11/02	Macro	CBK reduces discount rate 0.5% to 3.25%	2113	2130.6	2140.1	2162.5	2167.9
19/03/03	Attack	U.S-British invasion of Iraq	2759	2796.1	2754.7	2825.6	
27/03/03	Energy	Kuwait reopens 17 wells at Ratqa oilfield	closed	2754.7	2825.6	2873.5	
29/03/03	Attack	Iraqi missile hits Kuwait and damages a shopping mall					
24/04/03	Energy	OPEC agrees to reduce production by 2 million barrels per day	3301.6	3327.1	3377.6	3385.1	
06/07/03	Political	Kuwait Parliament election day	3658.7	3728.6	3750.4	3764.4	
19/07/03	Political	Mr. Khurafi re-electd as parliament speaker	3714.1	3621.5	3589	3652.6	
31/07/03	Energy	OPEC decided to keep production unchanged	3702.4	3723.1	3746.8	3746.8	
01/07/04	Macro	CBK raises discount rate 0.25% to 3.5%	5455	5416.7	5433.6	5478.8	5468.5
04/08/04	Macro	CBK raises discount rate 0.25% to 4%	5707.7	5655.1	5656.3	5608.3	5626.8
22/09/04	Macro	CBK raises discount rate 0.25% to 4.25%	6007.7	6029.7	6023.2	6056.2	6035.1
02/11/04	Political	U.S Presidential election day	6158.9	6146.3	6161.2	6177.9	
02/11/04	Political	UAE Leader dies	6158.9	6146.3	6161.2	6177.9	

Table 6: Cont'd.

Date	Type of Announcement	Event/Announcement	T=0	T+1	T+2	T+3	T+4
03/11/04	Political	George W. Bush determined President	6146.3	6161.2	6177.9	6161.8	
11/11/04	Macro	CBK raises discount rate 0.25% to 4.5%	6174.1	6210.7	6216.6	6263.4	6235.5
15/12/04	Macro	CBK raises discount rate 0.25% to 4.75%	6443.8	6457.6	6430.4	6405.1	6436.6
03/02/05	Macro	CBK raises discount rate 0.25% to 5%	6465.9	6501.9	6490.1	6500.3	6471.8
14/02/05	Attack	PM Rafiq Hariri killed in an explosion	6436.5	6436.5	6429.7	6389.3	
23/03/05	Macro	CBK raises discount rate 0.25% to 5.25%	7571.6	7596.3	7706	7735.4	7798.7
16/05/05	Political	Kuwaiti women granted political rights	8436.3	8423.1	8479.4	8484.3	
03/07/05	Macro	CBK raises discount rate 0.25% to 5.5%	8792.1	8728.5	8777.6	8818.7	8851.6
07/07/05	Attack	London's underground and bus system bombed	8851.6	8855.6	8785	8736.6	
01/08/05	Political	Saudi King Fahad dies	8973.1	8989.4	9016	9025.9	
03/08/05	Political	Saudi Crown Prince Abdullah announced King	9016	9025.9	9096	9184.4	
03/10/05	Macro	CBK raises discount rate 0.25% to 5.75%	10428.2	10491	10491.8	10515.4	10548.9
02/11/05	Macro	CBK raises discount rate 0.25% to 6%	11527.5	11628	11693.2	11699.2	11718.6
14/12/05	Political	U.S-British coalition capture Saddam Hussein	4615.2	4648.9	4665.9	4647	
15/01/06	Political	Kuwait Emir Seikh Jaber dies	11657.7	closed	closed	closed	
29/01/06	Political	Sheikh Sabah announced Emir of Kuwait	11849	11976.8	11943.8	11849.1	
21/05/06	Political	Emir of Kuwait dissolves parliament	9476.5	9402.4	9402	9607.1	
29/06/06	Political	Election day - Kuwait Parliament	9990	9984.8	9818	9851.7	
03/07/06	Macro	CBK raises discount rate 0.25% to 6%	9818	9851.7	9927.7	9949.3	9968.6
13/07/06	Attack	Israel attacks Lebanon	9998.1	9883.9	9572.2	9604.5	