“New market reforms and stock exchange liquidity: the case of Kuwait”

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NEW MARKET REFORMS AND STOCK EXCHANGE LIQUIDITY: THE CASE OF KUWAIT

Abstract

In developing markets, new regulations are imposed to protect investors, to assure fairness and to enhance trust through controlling all types of market abuse. In addition, these regulations are imposed to enhance the overall market performance and efficiency. Market liquidity is one of the main pillars used to measure market overall performance. In this paper, the authors attempt to analyze market liquidity before and after the passage of the Capital Market Authority Law of 2010 (CMA), aimed at enhancing investors' confidence and reinforcing better disclosure quality and accountability for Kuwait public companies. By introducing six liquidity measures that captures market depth, turnover, and volatility, the authors documented highly significant deterioration in all the measures following the CMA Law with more profound effect on smaller firms. The researchers concluded that overstated regulations in developing markets, in spite of its goal of improving market overall performance, structure, enhancing investors' protection, and market integrity, can have an adverse effect on market efficiency.

Keywords financial markets, market liquidity, market reforms, market efficiency

JEL Classification G10, G12, G18, G14

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INTRODUCTION

The stock exchange is the center of attention in a country's economy. Over the years, exchanges are the first to react to any financial crisis and always reflect the status of the economy. Efficient markets would secure price discovery and facilitate stock prices to reflect information to investors and market participants on a timely basis. Sound market regulations act as a tool to enhance market efficiency and investor's confidence. In addition to the importance of the existence of reliable market regulations, liquidity acts as another vital pillar to enhance market efficiency (Heflin et al., 2005). According to Downes, and Goodman (2006), market liquidity is defined as "the ability to buy or sell an asset quickly and in large volume without substantially affecting the asset's price". Or is defined as the "ability of continuously transforming asset from one form into another" (Ivanovic, 1997). Therefore, the functionality of the stock market as a source of funds for businesses and a tool of investment for savers promotes a country's economic growth. Since the creation of liquidity is considered as the main economic function of exchanges, we focus on this function and provide several measures for it in our analysis. In Kuwait, the passage of the Capital Market Authority Law (CMA) in 2010 introduced an important event that changed the financial market structure and regulatory environment. The introduction of the law aimed to enhance market integrity, reliability and investor's confidence. The new reform presented the following changes: creating an independent regulatory body, imposing new set of provisions that will criminalize and restrict all types of market abuse, introducing new restrictions on market par-

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ticipants, mainly dealers/brokers, introducing new corporate governance provisions, and privatizing Kuwait Stock Exchange. Due to the above, and to add to the scientific evidence on the relation between market liquidity and regulations in the MENA region, this research aims to assess the impact of the CMA Law on the stock exchange by focusing on the long-term behavior of market liquidity.

This study is motivated by the need for research devoted to assessing the effects of new market reforms on the functionality of Kuwait Boursa. Since the establishment of the new regulatory body in accordance with the CMA Law, Kuwait Boursa had experienced a significant drop in the trading value and total market capitalization. In addition, the market witnessed a large delisting wave, which has caused the number of firms to decrease from 224 firms in 2010 to 174 in 2017. The main two reasons for the above drop can be attributed to the regulatory burden and the aftermath of the financial crisis. In the GCC region, very limited research is devoted to assessing the consequences of the activation of new market reforms on market structure and performance. We focus on the liquidity aspect of the market, because it is documented that better quality of disclosure improves market liquidity through reducing information asymmetries across investors (Heflin et al., 2005). With the restoration of investors' confidence as expected by the activation of the new reform, we expect to witness higher trading and liquidity. However, surprisingly, market participants and traders decreased their trading activity. Our objective is to gain overreaching perspective on the impact of the CMA Law on investors and their willingness to trade. Therefore, we focus on analyzing the change in market liquidity before and after the CMA Law to determine whether the new reform improved the quality of market efficiency, and hence reduced information asymmetries and enhanced the liquidity.

We constructed six measures of liquidity, widely used in the literature such as Amihud (2002) to capture all aspects of market liquidity. We gathered main variables such as trading value, volume, market capitalization, stocks closing prices from Kuwait Boursa website for the period from 2005 to 2017. To examine the above relation, we constructed six hypotheses all related to our liquidity measures. We used non-parametric Mann-Whitney U test and parametric t-test to examine the hypotheses and to compare liquidity patterns around the CAM Law activation. The data were normalized by using logs to remove the effect of outliers. The results of the tests were all highly significant at the 0.1% level, confirming significant liquidity deterioration in the period after the CAM Law. All measures of liquidity that captured market depth, turnover, and volatility were significantly lower after the new reform. To accommodate our methodology, we constructed two OLS regression models to explore the relation between the CMA Law application period and the liquidity measures after controlling for firm size and sector. The results were all consistent with the notion of significant liquidity deterioration post-CMA Law with more profound results on smaller size firms. We concluded that market liquidity deteriorated with the application of the new rules of the securities market law.

1. KUWAIT STOCK EXCHANGE BACKGROUND

Kuwait Boursa was originally established in 1983 by an Ameeri Decree to restore market stability and confidence after al-Manakh financial crisis. The official governing body for Kuwait Boursa according to 1983 decree was the Market Committee (MC), which was headed by the Minister of Commerce. The MC was formed of 10 members, 2 independent, 4 representatives from the Chamber of Commerce, 3 representatives from the Central Bank of Kuwait, the Ministries of Finance and Commerce. The MC is considered a board of directors with no efficient enforcement or monitoring arms. Therefore, it was very essential for Kuwait at that time to establish an independent regulatory body with a wide range of powers/authorities to provide proper oversight to the market. After the financial crisis and after several attempts by activists and parliament members, the Securities Law (CMA) was passed in 2010. With the CMA Law, an independent regulatory body was created to oversight the securities market. Since the date when the stock exchange was originally established in 1983, the oversight role was not indepen-

dent, which caused a conflict of interest and a deviation from the international best practices and governance standards. The main role of the CMA as a new regulatory body is to enhance integrity in the market and restore investors' confidence through stronger transparency and governance rules. With the introduction of the CMA Law new provisions were issued to criminalize insider trading, market manipulation and securities fraud. In addition, the structure of the market has changed drastically.

The new Law was initiated to control all types of market manipulation, and hence to have a more vibrant, efficient market. Market efficiency indicates "that all agents are rational and that new information entering the market is correctly and immediately impounded into securities' prices" (Chelikani & D'Souza, 2011). Therefore, our main goal is to assess the quality of the new Securities Law and its direct impact on several dimensions of market performance and efficiency.

2. CAPITAL MARKET AUTHORITY LAW 2010 (CMA)

On February 28, 2010, Law No. 7 regarding the establishment of the Capital Market Authority (CMA) was issued. However, due to shortfalls and problems associated with the Law during the implementation phase, it was amended in August 2014 and Law No. 108 was issued. Moreover, due to more problems associated with its application it was amended for a second time less than one year later in May 2015 with Law No. 22. Nevertheless, the main objective of the Law and its amendments is to establish an independent government entity whose main task is to regulate and monitor the securities market. The issuance of the Capital Market Authority Law (CMA) in 2010 introduced critical change to Kuwait's market structure. To enhance market integrity and investor's confidence, the new reform introduced a series of changes: creation of an independent regulatory body, comprehensive change in the standards of licensing for all market participants, new set of provisions that criminalize and punish all types of market abuse, new restrictions on dealers/brokers, new corporate governance rules, and the privatization of Kuwait Stock Exchange. Pursuant to article 2, the Capital Market Authority is established under the oversight of the Minister of Commerce and Industry. In both articles 4 and 5, the CMA is empowered with full range of authorities to achieve its objectives that are stated in article 3. Chapter 3 of the Law regulates all aspects of the securities exchange and sets forth the conditions of the ownership structure of the exchange and board members.

For the purpose of this research, we focused on two aspects of the CMA Law: the first is related to restrictions on market maker activities and the second is related to market abuse conducts and penalties. Pursuant to Chapter 11 of the Law, all market abuse conducts are criminalized with a full range of deterrent disciplinary actions. For example, in article 118, the insider trading punishment can reach up to five years imprisonment in addition to a fine, which is not less than the amount of the benefit achieved and not more than three times this amount. Article 122 imposed restrictions on activities similar to those conducted by market makers. Among the activities which are restricted: "1-a) entering into a deal in a manner that is not conducive to real change in the Security's ownership"; "2-c) creating actual or fictitious trading for the purpose of encouraging others to purchase or sell". We expect that the above two restrictions would significantly restrict traders and hence affect market liquidity. Although the article required the CMA to set forth the rules explaining the instances included in the above two clauses, however, the rules were not issued and activated until several years after 2010.

In general, most of the articles included in Chapter 11 added an enforcement element to the market to enhance integrity and investors' confidence. However, the critical question of the research is whether the benefits foreseen from such rules would outweigh the cost?

3. LITERATURE REVIEW

The overall impact of market regulations on publicly traded firms such as Sarbanes-Oxley or Dodd-Frank and others remains in dispute. The

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enactment of Dodd-Frank Act of 2010 in the US market has mixed evidence. Adrian et al. (2017) examined market liquidity in the period around the financial crisis and the introduction of the Dodd-Frank Act. They documented a stagnation of dealer balance sheet in the period after the financial crisis, and when using U.S. Treasury and corporate bonds data, they find limited evidence of a decline in market liquidity. Trebbi and Xiao (2016) also examined the effect of the new regulation Dodd-Frank Act and Basel III after the financial crisis on market liquidity. They documented no evidence of liquidity deterioration in the period after the new regulation.

Sarbanes-Oxley Act (SOX) 2002 is another major reform imposed on the US market to restore confidence and integrity in the market by reinforcing accountability for public companies. Two different views were associated with SOX enforcement: the first group found supportive evidence of improved market liquidity (Kim et al., 2006; Jain & Rezaee, 2006; Rezaee, Olibe, & Minmier, 2003). Rezaee et al. (2003) documented improvement in the efficiency of the audit committee and its oversight function in response to SOX new disclosure requirements of the internal audit functions. Chelikani and D'Souza (2011) used mergers and acquisitions events and show that the implementation of SOX resulted in stronger market information, and lower levels of mispricing and hence stronger market efficiency. The second group of studies support the view that compliance with the Act was costly, especially for small firms (Ribstein, 2002; Asare, Cunningham, & Wright, 2007; Zhang, 2007). Cohen et al. (2008) found that the Act was associated with reduced incentive compensation rate, capital expenditures, and research and development expenses. Kamar et al. (2009) find supportive evidence of the hypothesis that implementation of SOX forced small firms out of the public market.

Daouk et al. (2006) documented improvements in all measures of market performance (liquidity, pricing efficiency, and cost of equity) following enforcement of governance and anti-insider trading laws. Majnoni and Massa (2001) investigated whether the new securities reforms introduced to the Italian Stock Exchange during the period from 1991 to 1994 have increased market efficiency. They found supportive evidence of strong positive correlation between the trading volume and price changes. Cumming et al. (2009) investigated the impact of stock market trading market manipulation rules on market liquidity for 42 countries during the period from 2006 to 2008 and found that differences in trading rules across countries affect the liquidity. The results indicate that liquidity measures such as velocity are associated with higher number of insider trading and market manipulation rules. Prevoo and Weel (2010) documented no significant change in the information value of announcement (abnormal return) in the period after the enactment of the Market Abuse Directive Act in Amsterdam Stock Market. However, the impact of significant change was high for small capitalization firms indicating that illegal insider trading regulation was most effective for smaller firms. Bushee and Leuz (2005) document that the enforcement of the 1934 SEC disclosure requirements caused significant costs on smaller firms to the extent of forcing them out of the market. However, the new requirements have significant benefits for firms with higher disclosure standards, which documented positive stock returns.

The liquidity aspect as an indicator of the general market efficiency and its relation to new market reforms is limited and inconclusive and needs to be further explored. Kim et al. (2006) examined the trends and determinants of market liquidity in the periods before and after Sarbanes-Oxley Act (SOX) enactment. They documented lower bid-ask spreads, higher market depths, and decreased adverse selection component pursuant to the passage of Sarbanes-Oxley Act. Bessembinder et al. (2016) documented a reduction in trade execution costs and inventory of corporate bonds and interpret their finding as a sign of liquidity deterioration triggered by post-crisis regulation. Dick-Nielsen et al. (2012) explored the liquidity components of corporate bonds in the period before and after the 2005–2009subprime crisis. They documented lower liquidity, measured by bond spreads, during the financial distress period with higher illiquidity for speculative grade bonds than investment grade ones. Vayanos and Wang (2012)

provided extensive coverage on the literature of market liquidity measurement. They related illiquidity to market imperfections, higher transaction costs and asymmetric information.

The link between market liquidity and regulations is inconclusive in the literature and requires further evidence, specifically in developing markets. In addition, the evidence from Kuwait and the GCC is very limited. This study is a complimentary research to provide further evidence through examining the impact of new reforms on the general performance of the market. We address the general market performance indicators, proxied by market liquidity, after CMA Law activation. The results of this line of studies will enhance the existing literature and fill the gap in the emerging markets research. Furthermore, it will assist policy markers and regulators to improve market regulations' quality and enhance the investment environment in the GCC region.

For the purpose of this study, we constructed six liquidity measures widely used in the literature.

4. LIQUIDITY MEASURES

There is no unified measure in the literature for liquidity. In general, liquidity refers to the easiness of converting an asset into cash without affecting its price negatively. However, in stock markets, liquidity is a multidimensional concept and is vital for effective market functioning and stability. Market liquidity is defined as "the ability to execute large transactions with limited price impact" (PWC, 2015).

Our study highlights the importance of market liquidity, which, we hypothesize, has been adversely affected since the passage of the CMA Law. We recognize that there are significant benefits to sound regulations in the securities markets. To have a vibrant market and to enhance investors' confidence and attract more investors come on the top list of benefits of sound market regulations. However, we note that the new market regulations were associated with significant drop in trading value, volume and stock market return, as well as decreased number of listed firms. Although, we recognize that the new reforms are not the only reason for reduced market liquidity, some of the reduced liquidity can be attributed to post-global financial crisis ramifications. However, the new reform, which introduced a comprehensive change in the market structure, had far-reaching impact on all listed firms and other market participants. Liquidity reduction, and hence market efficiency reduction, are among the direct impacts of the new reform. We assume that there are several broad factors driving market liquidity in Kuwait. These include: 1) the new market infrastructure enforced by the CMA Law coupled with the new licensing requirements, 2) the new fee structure and capital requirement imposed on market participants such as dealers and brokers, 3) the repercussions of the 2008 financial crisis, 4) the new rules and restrictions on all types of market manipulation such as insider trading and its impact on trading volume, 5) the global, regional and local economic market conditions, and 6) market size and development.

Liquidity has many dimensions described in the literature: depth and resilience, breadth, immediacy, and tightness. Depth and resilience can be measured by trading volume, price impact of volume, turnover ratios and intra-day volatility (PWC, 2015). Amihud (2002) introduced an illiquidity measure, which is calculated as "the average of the daily ratio of absolute stock return to its dollar volume" or the volume turnover divided by return volatility. Amihud's measure is considered one of the best measures of market depth in the literature, since it captures price change effect. Another measure of illiquidity is the bid-ask spread price (Dick-Nielson et al., 2012; Jain & Rezaee, 2006). Another related measure of liquidity that captures the trading volume trends is the turnover ratio defined as the ratio of trading volume to the number of shares outstanding (Amihud & Mendelson, 1986; Majnoni & Massa, 2001; Campbell et al., 1993; Daouk et al., 2006; Choi & Cook, 2005).

For the purpose of examining the relation between the CMA Law and different dimensions of market liquidity, we utilize the following measures from the finance literature: our first measure is the Turnover Ratio (TR) or referred to as "relative volume" measured as the ratio of daily traded value to the daily average market capitalization (Campbell et al., 1993; Jain & Joh, 1988). This mea-

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sure of liquidity is used to reduce the low-frequency variation in the daily series. A second version of this measure is referred to as turnover Ratio 2 (TR 2), calculated as the trading volume (number of shares) to the number of shares outstanding. The third measure is Market Depth (MD), which we use to capture volatility, and is calculated as the trading value divided by volatility (Amihud, 2002). This measure is derived from Amihud's liquidity measure, which "captures the quantity of trading per unit of volatility" (Daouk et al., 2006). Hasbrouck (2003) argued that Amihud's (2002) measure is the most efficient non-intraday measure of price impact.

The forth measure used in this study is the Trading Volume (TV), which is a simple measure of market liquidity to provide an initial indication on liquidity (Daouk et al., 2006, Choi & Cook, 2005). It is calculated as the ratio of trading value per month per company to the market capitalization in the end of the month. We calculated the TV Measure on a monthly basis, and specifically we conditioned 5-day minimum of trading in any specific month to include the firm in the calculations. The next two measures are used to calculate the market illiquidity and are both derived from Amihud's (2002) measure. The first one is Amihud's Illiquidity Measure (AmiILL). According to this measure, lower market liquidity levels are associated with higher values. The last measure is the Price Impact Illiquidity Measure (PIIL) and it is calculated, according to Lui et al. (2016), "based on the absolute value of daily return-to-volume ratio". PIILL is designed to consider the cost-per-volume benchmark well (Fong et al., 2014; Lui et al., 2016).

The liquidity measures are listed below.

1. Turnover Ratio Measure (*TR*); the ratio of KD value of shares traded per day to the KD market capitalization per day (total amount outstanding).

2. Turnover Ratio Measure 2 (*TR*2); the ratio of the number of shares traded to the number of shares outstanding.

3. Market Depth Measure (*MD*); the ratio of traded value per day to the standard deviation of daily return calculated each month.

4. Trading Volume Measure (*TV*); the ratio of KD value of shares traded per month to KD market capitalization at the end of month.

5. Amihud Illiquidity Measure (*AMI*); the ratio of the daily average of absolute returns divided by the traded KD value.

6. Price Impact Illiquidity Measure (*PIIL*); the ratio of the absolute value of daily return to daily trading value.

Note that all measures are calculated daily and aggregated for all companies, except for measures 4 and 6, which are calculated monthly for each company in the market.

Calculation is shown below in equations 1-6:

$$TR_t = \frac{\sum_{\text{all } i} T_{i,t}}{\sum_{\text{all } i} MC_{i,t}}, \quad (1)$$

$$TR2_t = \frac{\sum_{\text{all } i} V_{i,t}}{\sum_{\text{all } i} MC_{i,t}}, \quad (2)$$

$$MD_t = \frac{\sum_{\text{all } i} T_{i,t}}{S_m}, \quad (3)$$

$$TV_m = \frac{\sum_{t \in m} T_{i,t}}{MCe_{i,m}}, \quad (4)$$

$$AMI_t = \frac{\sum_{\text{all } i} |r_{i,t}|}{\sum_{\text{all } i} T_{i,t}}, \quad (5)$$

$$PIIL_m = \frac{1}{N_{i,m}} \sum_{t \in m} \frac{|r_{i,t}|}{T_{i,t}}, \quad (6)$$

where $T_{i,t}$ is the KD traded value for company i at day t, $V_{i,t}$ is the number of shares traded for company i at day t, $MC_{i,t}$ is the market capitalization for company i at day t, $MCe_{i,m}$ is the market capitalization for company i at the end of month m, $r_{i,t}$ is the daily stock return for company i at day t, where $r_{i,t} = \left(P_{i,t} / P_{i,t-1}\right) - 1$, S_m is the standard deviation for all daily stock returns $r_{i,t}$ for month m, $N_{i,m}$ is the number of days $r_{i,t}$ available for company i at month m, $P_{i,t}$ is the stock closing price for company i at day t.

5. RESEARCH HYPOTHESES

The main objective of this research is to explore the trends in market liquidity in the period before and after the CMA Law enforcement in Kuwait. The passage of the CMA Law came as an initiative to restore investors' confidence after the financial crisis ramifications when several cases of high-profile scandals were exposed. When the quality of information released by public companies becomes questionable, market participants face bigger risk of trading against confidentially informed insiders and suffering losses in their trades. An investigation of the liquidity measures will provide an indication on the efficiency of the CMA Law in addressing market deficiencies. If the CMA Law was successful in restoring investor's confidence, we should detect improvements in all liquidity measures. In this paper, we expect higher liquidity measures to be associated with the passage of the CMA Law. Daouk et al. (2006) argued that market liquidity can be used to capture one dimension of market performance. Choi and Cook (2005) documented a steep drop in the liquidity in the period after the financial crisis in the Japanese stock market, which shows liquidity as an indicator of market performance. To capture all dimensions of liquidity such as market depth, turnover, and volatility, we constructed six different liquidity measures.

In our analysis, we aim to further explore whether the changes in liquidity measures in the post-CMA Law period are of equal magnitude across firms of different sizes and sectors. Kamar et al. (2009) examined whether Sarbanes Oxley Act (SOX) 2002 was the reason for the big wave of public firms to convert to private firms. They argued that complying with the new Law, SOX has driven small firms to exist in the public capital market. The following hypotheses are developed to explore the research's main objective:

Hypothesis 1

H0: The Trading Volume Measure (TV) of Kuwait stock market is the same in the period before and after the enforcement of CMA Law.

H1: The Trading Volume Measure (TV) of Kuwait stock market is significantly different in the period before and after the enforcement of CMA Law.

Hypothesis 2

H0: The Turnover Ratio Measure (TR) of Kuwait stock market is the same in the period before and after the enforcement of CMA Law.

H1: The Turnover Ratio Measure (TR) of Kuwait stock market is significantly different in the period before and after the enforcement of CMA Law.

Hypothesis 3

H0: The Turnover Ratio Measure (TR2) of Kuwait stock market is the same in the period before and after the enforcement of CMA Law.

H1: The Turnover Ratio Measure (TR2) of Kuwait stock market is significantly different in the period before and after the enforcement of CMA Law.

Hypothesis 4

H0: The Market Depth Measure (MD) of Kuwait stock market is the same in the period before and after the enforcement of CMA Law.

H1: The Market Depth Measure (MD) of Kuwait stock market is significantly different in the period before and after the enforcement of CMA Law.

Hypothesis 5

H0: The Amihud Illiquidity Measure (AMI) of Kuwait stock market is the same in the period before and after the enforcement of CMA Law.

H1: The Amihud Illiquidity Measure (AMI) of Kuwait stock market is significantly different in the period before and after the enforcement of CMA Law.

Hypothesis 6

H0: The Price Impact Illiquidity Measure (PIIL) of Kuwait stock market is the same in the

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period before and after the enforcement of CMA Law.

H1: The Price Impact Illiquidity Measure (PIIL) of Kuwait stock market is significantly different in the period before and after the enforcement of CMA Law.

Hypothesis 7

H0: The liquidity indicators of large size firms measured by MC are the same in the period before and after the enforcement of CMA Law.

H1: The liquidity indicators of large size firms measured by MC are significantly different in the period before and after the enforcement of CMA Law.

Hypothesis 8

H0: The liquidity indicators of firms from different market sectors are the same in the period before and after the enforcement of CMA Law.

H1: The liquidity indicators of firms from different market sectors are significantly different in the period before and after the enforcement of CMA Law.

6. DATA AND METHODOLOGY

To study the effect of the new market reforms on market liquidity, we deployed data from Kuwait Stock Exchange official website (Kuwait Boursa) of all public listed firms, (https://data.boursakuwait.com.kw/history/SecEndOfDayData.aspx). We compiled the following data for all the listed firms (235) for the period from January 1, 2005 until December 31, 2017, excluding the event year (2010). Our initial sample has 540,000 observations, which are aggregated by firms. We then apply data filters to clean and standardize the data as follows:

- the event year (2010) when the Parliament passed the CMA Law was excluded from the data set;
- 45 firms with missing data of number of shares and market capitalization for the full period were excluded, as some firms were delisted and some were newly listed during the 13-year period;
- 4 days with zero trading for the full market were excluded (unknown reason for market zero trading behavior);
- to normalize the data and to remove the effect outliers, 3% of the highest trading firms were excluded on a daily basis from 3 main liquidity measures.

The total number of firms included in our analysis after the filtering process reached 190 with 489,045 observations. The database suffered from some inaccuracy in day data due to weekend holiday day shift from Thursday / Friday to Friday / Saturday, which occurred in September 2007. The previous change required manual adjustment and matching of the dates with the actual trading days, as our data are daily and the calculation of our variable requires daily stock return. We created several data sets for our analysis purposes as follows: the new six liquidity measures (Turnover (TR), Turnover TR 2, Market Depth (MD), Trading Volume (TV), Amihud Illiquidity (AMI), Price Impact Illiquidity (PIIL)); and the other main variables (trading KD value, trading volume, number of trades, market capitalization, and daily stock return, monthly stock return). All measures and variables were paired for two periods five years before the CMA Law and seven years after the Law. To control for presence of outliers, we trimmed 3% of the data by removing the highest 3% of trading value amount per firm per day, which we used in three of the liquidity measures.

To test the above hypotheses, we performed the following three main steps:

1. Constructing liquidity measures to proxy for liquidity trends in Kuwait Stock Exchange. We calculated six measures widely used in the literature to capture several aspects of liquidity such as market depth, turnover, volatility and efficiency. Details are shown in section 4 above.

2. Examining for significance in differences in liquidity measures between the two periods around the CMA Law. We used parametric (Student t-test) and nonparametric (Mann-Whitney U test). We used both tests to confirm that our results are consistent and robust. The first test assumes normality and the second does not assume normality.

3. Examining the relation between the liquidity measures and two main aspects of listed firms, specifically size and sector, after the CMA Law. We used ordinary least square regression model (OLS) to test the effect of introducing the CMA Law in Kuwait on market liquidity by controlling for firm size and sector. The model captures the direct relation between the activation of the CMA LAW in Kuwait in 2010 and our measures of liquidity and examine whether this relation is affected by size of the company, or its sector in the pre-post CMA Law periods.

Our OLS regression models are shown below in equations 7-8:

$$PII_{it} = \beta_0 + \beta_1 P_t + \beta_2 \cdot \log MC_{it} + \\ + \beta_3 P_t \cdot \log MC_{it} + \beta_4 S_i + \beta_5 P_t \cdot S_i + \varepsilon_{it}, \quad (7)$$

where PII_{it} is the dependent variable representing the illiquidity indicator for firm i for year t, P_t represents a binary variable, assigned 0 for the period before applying the CMA Law and 1 otherwise, $\log MC_{it}$ represents the average market capitalization for firm i at year t, S_i is a binary variable, assigned 0 if firm i is non-financial, and 1 otherwise, and an interaction between the period P_t and firm size $\log MC_{it}$. This interaction is the key variable in the model as it captures the behavior of the size variable in the presence of the CMA Law. The β_o, β_1, β_2, β_3, β_4 and β_5 are coefficients, ε_{it} is a random error.

$$TV_{it} = \beta_0 + \beta_1 P_t + \beta_2 \cdot \log MC_{it} + \\ + \beta_3 P_t \cdot \log MC_{it} + \beta_4 S_i + \beta_5 P_t \cdot S_i + \varepsilon_{it}, \quad (8)$$

where TV_{it} is the dependent variable representing the liquidity indicator (trading volume measure) for firm i for month t, P_t represents a binary variable, assigned 0 for the period before applying the CMA Law and 1 otherwise, $\log MC_{it}$ represents the average market capitalization for firm i at month t, S_i is a binary variable, assigned 0 if firm i is non-financial, and 1 otherwise, the β_o, β_1, β_2, β_3, β_4 and β_5 are coefficients, ε_{it} is a random error.

7. RESULTS

7.1. Summary statistics

Table 1 provides the mean and median for our main study data on an annual basis and in the period before the CMA Law (Panel A), and in the post-reform period. A significant drop can be observed in the period after the CMA Law in the trading volume, KD trading value, and the number of trades. In 2013, the trading increased slightly and temporarily for several reasons. One of the main reasons for this increase is attributed to the rejection of many legal cases filed by the CMA against traders by the courts. A second reason is attributed to the public offering event of Warba Bank, which occurred during September. Another big drop occurred during the post-CMA period occurred in market capitalization (from KD 988,038,441 in 2005 to KD 164,320,239 in 2017), which can be attributed to the CMA Law activation and the global financial crisis of 2008. We observe a significant variation between the median figures between the two periods in the trading volume and value. For example, in 2011, one year after the launch of operations by the new regulator, the median was zero for all the previous variables. This is an indication that, on average, more than half of the firms listed on the market has zero trading.

Table 2 below shows summary statistics of the mean, median and standard deviation of the main liquidity measures before and after the introduction of the CMA Law. We observe a significant difference across the six liquidity measures between the pre and post CMA Law period. The Amihud ratio, which measures the illiquidity, shows the highest variation. The values in the five-year period before the CMA Law were significantly lower than the values in the post-CMA period, indicating a significant drop in liquidity after the Law enactment. This drop can be attributed to the negative attitude of investors towards the new regulations and regulator procedures in monitoring the

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Table 1. Descriptive statistics for the main variables in pre-post CMA Law

Year		Daily return, %	Trading volume	KD trading value	No. of trades	Market cap
Panel A. Pre-CMA						
2005	Mean	0.278	1,424,264	825,678	53.85	988,038,441
	Median	0.000	265,000	143,600	15.00	259,428,406
2006	Mean	–0.098	777,582	423,894	32.88	908,014,221
	Median	0.000	120,000	51,850	8.00	232,906,984
2007	Mean	0.117	1,401,553	852,502	43.81	910,309,086
	Median	0.000	200,000	85,750	11.00	191,251,371
2008	Mean	–0.226	1,442,254	692,413	37.16	768,959,283
	Median	0.000	170,000	60,350	9.00	174,948,660
2009	Mean	0.078	1,953,092	453,546	36.87	496,134,710
	Median	0.000	60,000	11,650	3.00	117,495,855
Panel B. Post-CMA						
2011	Mean	–0.030	661,715	117,193	11.48	215,708,264
	Median	0.000	0	0	0.00	30,412,687
2012	Mean	0.069	1,668,076	156,675	24.71	197,820,488
	Median	0.000	20,000	3,250	3.00	31,531,500
2013	Mean	0.098	2,642,611	232,397	45.63	203,512,469
	Median	0.000	82,507	14,200	7.00	38,076,801
2014	Mean	–0.056	1,179,906	134,110	26.34	200,399,081
	Median	0.000	64,335	9,500	6.00	35,550,905
2015	Mean	–0.036	913,990	85,032	20.86	174,420,824
	Median	0.000	30,000	3,501	4.00	28,611,464
2016	Mean	0.034	650,435	61,392	15.29	144,853,673
	Median	0.000	14,543	1,495	3.00	24,599,953
2017	Mean	0.055	1,099,441	124,509	26.21	164,320,239
	Median	0.000	31,913	3,515	4.00	28,598,651
Total	Mean	0.018	1,339,568	307,353	30.02	394,448,340
	Median	0.000	60,000	10,540	5.00	56,833,217

market. An interesting observation of Amihud Measure was the drop in an ascending order during the post-CMA Law period from 0.001247 in 2011, the first year of launching the new regulator, to reach 3.4584 in 2017, indicating a significant drop in liquidity. A median Turnover Ratio for the 5-year period before the CMA Law of 73% indicates that the average stock in the market takes 9 months to turnover once, in comparison to a median of 57% for the 7-year period after the CMA Law, indicating that an average stock takes around 6 months to turnover once. Note that two of our measures, Amihud and the Price Impact Illiquidity Measure, measure illiquidity with higher values to indicate liquidity deterioration. In Panel A of the table, both measures have very low values compared to the values of the illiquidity measures in Panel B. The mean and median of Amihud Measure (AMI) in the pre-CMA period is 0.0007, 0.0005 compared with 1.7289, and 0.1562, respectively, in the post-CMA period. Similarly, the mean and median of the Price Impact Illiquidity Measure (PIIL) in the pre-CMA period is 0.0009 and 0.0002, compared to 2.3944 and 0.0016, respectively. Both the AMI and PIIL Measures measure the illiquidity with lower values, representing higher liquidity in the pre-CMA Law period. The above results provide a strong indication of significant increase in the illiquidity in the post-CMA Law period.

Table 3 below shows summary of the mean, median and standard deviation of the main liquidity measures, but on a trimmed per year before and after the introduction of the CMA Law. We used trimmed data to mitigate the effect of outliers and to normalize the data. The results in Table 3 are in line with the previous table and confirm the same trends. We observe a significant difference across the three trimmed liquidity measures between the pre and post CMA Law period. Both the Amihud Measure and the Turnover show significant variation. The values in the five-year period before the CMA Law were significantly different than the

Table 2. Summary statistics of all the liquidity measures in the pre-post CMA Law period

Years		Amihud Illiquidity	Turnover Ratio	Turnover Ratio 2	Trading Volume	Market Depth	Price Impact Illiquidity
Panel A. Pre-CMA							
2005	Mean	0.0004	0.843	2.200	0.760	2,811	0.0005
	Median	0.0003	0.816	2.200	0.792	2,834	0.0001
	SD	0.0002	0.323	0.772	0.159	841	0.0010
2006	Mean	0.0007	0.476	1.250	0.713	1,884	0.0008
	Median	0.0006	0.458	1.207	0.752	1,735	0.0002
	SD	0.0004	0.207	0.488	0.181	899	0.0013
2007	Mean	0.0004	0.993	2.255	0.739	4,747	0.0005
	Median	0.0004	0.791	2.139	0.789	4,310	0.0001
	SD	0.0003	1.234	0.974	0.194	3,795	0.0010
2008	Mean	0.0008	0.922	2.390	0.739	3,989	0.0009
	Median	0.0005	0.854	2.368	0.793	3,480	0.0002
	SD	0.0007	0.429	0.975	0.213	2,149	0.0015
2009	Mean	0.0013	1.000	3.310	0.667	2,336	0.0016
	Median	0.0011	0.750	2.684	0.737	1,855	0.0006
	SD	0.0008	0.743	2.037	0.269	1,523	0.0024
Pre	Mean	0.0007	0.860	2.334	0.720	3,179	0.0009
	Median	0.0005	0.736	2.095	0.773	2,821	0.0002
	SD	0.0006	0.722	1.380	0.214	2,392	0.0016
Panel B. Post-CMA							
2011	Mean	0.0013	0.539	1.165	0.569	753	0.0016
	Median	0.0011	0.485	1.082	0.688	653	0.0006
	SD	0.0006	0.238	0.499	0.316	396	0.0026
2012	Mean	2.8391	0.788	2.931	0.629	963	4.0574
	Median	0.1562	0.722	2.872	.715	931	0.0012
	SD	9.1340	0.527	1.496	0.290	34	42.2529
2013	Mean	0.1711	0.900	4.663	0.687	1,689	0.2612
	Median	0.4400	0.755	3.805	0.751	1,546	0.0005
	SD	0.4313	0.844	2.803	0.266	783	1.8242
2014	Mean	1.1308	0.618	2.058	0.677	1,006	1.2663
	Median	0.2499	0.605	1.820	0.737	930	0.0012
	SD	3.1938	0.272	0.958	0.240	435	10.6487
2015	Mean	1.8373	0.507	1.600	0.672	616	2.4655
	Median	0.4308	0.457	1.402	0.717	564	0.0031
	SD	3.6211	0.199	0.734	0.215	278	20.0681
2016	Mean	2.3686	0.437	1.140	0.630	442	3.4861
	Median	0.2965	0.420	1.074	0.694	423	0.0052
	SD	5.3990	0.191	0.549	0.241	218	34.8715
2017	Mean	3.4584	0.755	1.880	0.655	738	4.5391
	Median	0.5281	0.593	1.011	0.711	539	0.0057
	SD	8.7349	0.527	1.884	0.240	569	41.7462
Post	Mean	1.7289	0.652	2.234	0.647	890	2.3944
	Median	0.1562	0.545	1.615	0.718	710	0.0016
	SD	5.7012	0.489	1.903	0.262	651	27.9175

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values in the post-CMA period, indicating a significant drop in liquidity after the new Law period.

Table 3. Summary statistics of liquidity measures (trimmed basis) in pre and post CMA period

Years	N		Turnover Ratio	Turnover Ratio 2	Market Depth (*m*)
Panel A. Pre-CMA					
2005	207	Mean	0.656	1.557	2,164
		Median	0.635	1.509	2,185
		SD	0.252	0.561	663
2006	206	Mean	0.343	0.863	1,336
		Media	0.323	0.800	1,136
		SD	0.158	0.345	661
2007	225	Mean	0.666	1.506	3,164
		Median	0.592	1.439	3,024
		SD	0.351	0.632	1,217
2008	259	Mean	0.662	1.556	2,840
		Median	0.621	1.547	2,460
		SD	0.328	0.625	1,791
2009	260	Mean	0.638	2.009	1,421
		Median	0.482	1.578	1,166
		SD	0.493	1,271	928
Total	Pre	Mean	0.600	1.525	2,195
		Median	0.521	1.363	1,925
		SD	0.364	0.857	1,376
Panel B. Post-CMA					
2011	207	Mean	0.374	0.658	483
		Median	0.354	0.313	420
		SD	0.177	0.625	247
2012	249	Mean	0.557	1.509	671
		Median	0.491	1.363	597
		SD	0.415	0.863	549
2013	249	Mean	0.807	2.480	1,162
		Median	0.668	2.010	1,069
		Sd	0.469	1.582	538
2014	244	Mean	0.519	1.220	752
		Median	0.490	1.137	682
		SD	0.209	0.525	331
2015	249	Mean	0.378	0.857	450
		Median	0.340	0.751	406
		SD	0.161	0.424	213
2016	246	Mean	0.318	0.677	306
		Median	0.299	0.621	285
		SD	0.140	0.350	159
2017	249	Mean	0.546	1.246	503
		Median	0.412	0.670	321
		SD	0.443	1.311	478
Total	Post	Mean	0.503	1.251	622
		Median	0.421	0.915	498
		SD	0.356	1.085	472

Table 4 describes the results of the Mann-Whitney U test of the five main liquidity measures using the pre-post CMA law binary as the grouping variable for each of the liquidity proxies. The results show a significant and highly robust evidence of liquidity deterioration across all measures that are statistically significant at the 0.1% level. The results are very robust across different proxies of market liquidity. The above indicates lower market liquidity after the introduction of the Capital Market Authority Law across the six liquidity measures during the long-term window around the event year. We used five-year period before and seven-year period after the CMA event to confirm that our results are strong and not driven by the financial crisis, which hit the market in 2008. Despite the consequences of the financial crisis, the market liquidity during the crisis period outperformed the liquidity after the crisis. On the contrary, to common expectations of market liquidity deterioration after the financial crisis, we documented higher liquidity after the crisis (pre-CMA Law) and lower liquidity after the new reform enactment (post-crisis). Even after removing the effect of outliers, the three measures of market liquidity with trimmed values (Turnover, Turnover 2, and Market Depth), the results were persistent and statistically significant at the 0.1% level, providing more supportive evidence of liquidity deterioration post-CMA year event.

The abovementioned results are consistent with the argument that heavy and overstating regulations can have an adverse effect on the market. Cumming et al. (2011) argued that vague regulations create inefficiency to traders and investors and reduce their confidence in the market place. Securities laws should facilitate stock exchange's growth and development, and hence improve market efficiency and liquidity. However, the results indicate steep drop in the liquidity of the Kuwait stock market post-CMA Law activation in 2010. The delisting trend, which occurred since 2011, supports our results and conclusion. The total number of firms, which were delisted, either voluntarily or mandatory, from the market reached 49 firms. This high delisting percentage (21%) is another indication of higher regulatory compliance cost. The lower liquidity after the new market reform means weaker firms' desire to be listed in the exchange or raises the cost of being public. This is consistent with the findings of Wallison (2015) and Kamar et al. (2009). Kamar et al. (2009) documented evidence in line with the

Table 4. Mann-Whitney U test of the five liquidity measures and three trimmed measures

Variable		Mann-Whitney U test	Mean rank		Z	*p*-value
			Pre	Post		
Turnover ratio	Full data	703,848	1,664	1,263	12.77***	0.000
	Trimmed	782,601	1,596	1,309	9.12***	0.000
Turnover ratio 2	Full data	818,490	1,565	1,330	7.46***	0.000
	Trimmed	678,945	1,685	1,248	13.93***	0.000
Market Depth	Full data	152,021	2,141	937	38.35***	0.000
	Trimmed	179,324	2,117	953	37.09***	0.000
Trading Volume	–	52,839,481	13,244	11,047	23.77***	0.000
Amihud Illiquidity	–	104,728	670	1,942	40.55***	0.000
Price Impact Illiquidity	–	21,727,748	6,598	11,031	53.88***	0.000

Note: *, **, *** show statistical significance at 5%, 1% and 0.1% levels, respectively.

hypothesis that Sarbanes-Oxley Act of 2002 has higher burden on smaller firms. Wallison (2015) argued that the reason for the sluggish recovery in the economy is attributed to Dodd-Frank Act of 2010. This Act placed very high regulatory burden on the market and has imposed new restrictive lending rules on small banks, which adversely affected the economy.

In this paper, we argue that the substantial number of new legal requirements imposed on listed firms, in addition to the substantial change in market structure, caused a significant reduction in trading, and hence, liquidity deterioration.

Table 5 shows the results of the parametric t-test for five liquidity measures and the three trimmed ones. The results are persistent and highly significant at the 0.1% level for all the liquidity measures, except for the untrimmed Turnover Ratio 2, which was significant on the trimmed basis. The Turnover is defined as the value of traded shares per day to market capitalization per day. The difference is highly significant at the 0.1% level, as the liquidity measure decreased significantly after the CMA Law year. Market Depth ratios (trimmed and untrimmed) declined significantly after the new reform, with significance level of 0.1%. This is a better measure of market depth, as it captures the quantity of trading value to the standard deviation of daily return (volatility). Again, the liquidity measured by Market Depth in the period before and after the introduction of the CMA Law is statistically different and the difference is significant at the 0.1% level. The last row in Table 5 shows the parametric t-test results for the Price Impact Illiquidity Measure (PIIL), with higher values to be associated with lower liquidity. This measure is derived from Amihud (2002), as it reflects the cost-per-volume benchmark reasonably (Fong et al., 2014). It is considered one the most widely used liquidity measures in the litera-

Table 5. Student t-test of the five liquidity measures and three trimmed measures

Variable (pre-post)		Levene's test		t-test for equality of means	
		F	*p*-value	Z	*p*-value
Independent samples					
Turnover ratio	Full data	14.27***	0.000	8.52***	0.000
	Trimmed	12.52***	0.000	7.02***	0.000
Turnover ratio 2	Full data	54.28***	0.000	1.62	0.106
	Trimmed	20.34***	0.000	7.53***	0.000
Market Depth	Full data	431.26***	0.000	31.76***	0.000
	Trimmed	905.73***	0.000	37.41***	0.000
Trading Volume	–	385.19***	0.000	23.20***	0.000
Amihud Illiquidity	–	264.77***	0.000	–12.47***	0.000
Price Impact Illiquidity	–	166.89***	0.000	–9.37***	0.000

Note: *, **, *** show statistical significance at 5%, 1% and 0.1% levels, respectively.

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ture. The PIIL Measure, which is highly significant at the 0.1% level in the parametric test, was also highly significant at the 0.1% in the Wilcoxon non parametric test (shown in Table 4), indicating significant difference in illiquidity between the pre and post periods. All the above results revealed stronger evidence and confirm a robust indication of lower market liquidity, and hence lower market efficiency after the introduction of the CMA Law in Kuwait market.

7.2. Regression models results

We constructed two regression models to examine the relation between market liquidity around the CMA Law. In each model, we used a liquidity measure as dependent variable and the following independent variables: dummy variable that equals 0 in the pre-CMA Law period, and 1 otherwise (period), log market capitalization to proxy for firm size (log*MC*), dummy variable that equals 0 for non-financial firms, and 1 otherwise (sector), in addition to interaction variables. In the first model, we used the illiquidity PIIL Measure as a dependent variable. The results displayed in Table 6 with highly significant coefficients at the 0.1% level (*R* square of 0.306) are as follows:

1. The liquidity has decreased significantly in the post-CMA Law period, with positive Beta coefficient of 5.069, indicating higher illiquidity after the Law.

2. In the pre-CMA period, larger firms have higher liquidity with negative Beta coefficient of –0.389, indicating lower illiquidity to be associated with larger firms.

3. In the post-CMA period, the liquidity has decreased significantly, however, smaller firms are more affected in terms of liquidity by the CMA Law, indicating larger gap in liquidity difference between small and large firms, and, hence, higher liquidity deterioration for smaller firms. The Beta coefficient for the interaction variable is –0.522 (significant at the 0.1% level) and aggregate post-CMA Law Beta of –0.911.

4. In the pre-CMA period, firms from the financial sector have higher liquidity with Beta coefficient of –0.239, indicating lower illiquidity to be associated with the financial sector.

5. In the post-CMA period, the liquidity has decreased significantly, however, firms from the non-financial sector are more affected in terms of liquidity by the CMA Law, indicating larger gap in liquidity difference between financial and non-financial sector, and, hence, higher liquidity deterioration for non-financial sector. The Beta coefficient for the interaction variable is –0.146 (significant at the 0.1% level) and an aggregate post-CMA Law Beta of –0.385.

In sum, we conclude from the regression analysis results that liquidity deteriorated significantly after the activation of the CMA Law. This deterioration is higher for smaller firms, which were affected negatively by the new regulation requirements. When we differentiate between firms using the log of market capitalization, we find more profound effect of liquidity deterioration on smaller firms than on larger firms. The delisting trend that occurred in the period from 2010 to 2017 is one of the consequences of the higher regulatory burden on smaller firms. We argue that smaller firms should receive some exemptions by the regulator from the legal requirements. For example, the SEC provided the US firms with lower market capitalization than 75 million USD up to 3 years deadlines extensions to comply with the new Act's requirements.

Our results above are consistent with the literature; stringent market regulations disadvantage small firms and unduly increase the cost of being public. Kamar et al. (2009) documented a trend of going private for smaller size firms after the activation of Sarbanes-Oxley Act (SOX) of 2002. Block (2004) documented that one of most commonly stated reasons for smaller firms to be delisted is the high cost associated with financial reporting imposed by SOX Act. Regulators should conduct cost-benefit analysis of the new market regulations to evaluate the effects on smaller firms. The consequences of the new legal requirements caused all market liquidity measures to deteriorate, market size to decrease, number of listed firms to decline, and hence market efficiency to be adversely affected.

In the second regression model, we used Trading Volume Measure (TV), which captures market turnover, as a dependent variable. Notably, some of the results are slightly not consistent with our illiquidity measure (PIIL) since the TV Measure captures different dimension of liquidity. Kyle (1985) described the three aspects of market liquidity: depth, resilience and tightness. These dimensions can be translated to a general definition of market liquidity, which "describe the ability of trading a substantial amount of assets, quickly, at low cost, and at a reasonable price" (Brennan et al., 2012). The conversion process of these assets in the market into cash has cost components that are not easy to measure. Garabedian and Inghelbrecht (2015) describe in detail the list of these cost components such as market impact, brokerage commissions, bid-ask spreads and search cost. Accordingly, there is no one measure in the literature that can capture all aspects, dimensions or layers conveyed within liquidity. Therefore, in some cases, the results can vary when measuring the liquidity and explore its relationship with market or firm specific determinants. And in spite of the differences among liquidity measures dimensions, our results were robust and consistent across all models and analysis.

We believe that the PIIL Measure is theoretically more reliable than the TV Measure in reflecting the market liquidity dimensions (Fong et al., 2017; Garabedian & Inghelbrecht, 2015; Lui et al., 2016). Our opinion is supported by the stronger and higher coefficients and *R* square values of the first regression model. The results, displayed in Table 7 with highly significant coefficients at the 0.1% level (*R* square of 0.063), are as follows:

6. Consistent with the previous regression, the liquidity has decreased significantly in the post-CMA Law period, with negative Beta coefficient of –1.039, the negative sign indicates lower liquidity after the activation of the Law.

7. In the pre-CMA period, smaller firms have higher liquidity with negative Beta coefficient of –0.076, indicating lower liquidity to be associated with larger firms. This result is opposite to the above model due to different aspect of the liquidity proxy.

8. In the post-CMA period, the liquidity has decreased significantly, however, smaller firms are more affected by the CMA Law. This result indicate that the liquidity of smaller firms was highly affected by the activation of the CMA Law than larger firms. This conclusion is consistent with the results of the first regression model. The Beta coefficient for the interaction variable is 0.121 (significant at the 0.1% level) and aggregate post-CMA Law Beta of 0.045.

9. In the pre-CMA period, firms from the financial sector have higher liquidity with Beta coefficient of 0.77, indicating lower liquidity to be associated with the nonfinancial sector and this result is consistent with the above model.

10. In the pre-CMA period, the sector coefficient was not significant, indicating no difference between the financial and nonfinancial sector in terms of liquidity.

11. In the post-CMA period, the interaction coefficient of sector-period was insignificant, indicating no difference between the liquidity of the financial and nonfinancial sectors.

In sum, the regression model provides additional supporting evidence of liquidity deterioration after the CMA Law. Both models support the notion that the liquidity deterioration is more pro-

Table 6. Results of OSL regression for the liquidity measure PIILL (Model 1)

Variables	Coefficient	Std. error	t	*p*-value
Constant	–0.308	0.199	–1.54	0.123
Period	5.069	0.236	21.50***	0.000
log*MC*	–0.389	0.024	–16.42***	0.000
Period Ч log*MC*	–0.522	0.029	–18.21***	0.000
Sector	–0.238	0.031	–7.72***	0.000
Period Ч Sector	–0.146	0.039	–3.78***	0.000

Note: Dependent variable: PIIL. Adjusted R^2 = 0.306 and model F = 1651.4*** (0.000).

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Table 7. Results of OLS regression for the liquidity measure TV (Model 2)

Variable	Coefficient	Std. error	t	*p*-value
Constant	1.302	0.033	40.01***	0.000
Period	– 1.039	0.039	– 26.44***	0.000
log*MC*	– 0.076	0.004	– 19.28***	0.000
Period Ч log*MC*	0.121	0.005	24.94***	0.000
Sector	0.077	0.005	14.60	0.000
Period Ч sector	– 0.010	0.007	– 1.54***	0.123

Note: Dependent variable: TV. Adjusted R^2 = 0.062 and model F = 316.7*** (0.000).

Table 8. Summary of hypotheses results testing of market liquidity in pre and post CMA Law period

No.	Null hypothesis (H_0)	Result
1	The Trading Volume Measure (TV) of Kuwait stock market is the same in the period before and after the enforcement of CMA Law	Reject 0.1%
2	The Turnover Ratio Measure (TR) of Kuwait stock market is the same in the period before and after the enforcement of CMA Law	Reject 0.1%
3	The Turnover Ratio Measure (TR2) of Kuwait stock market is the same in the period before and after the enforcement of CMA Law	Reject 0.1%
4	The Market Depth Measure (MD) of Kuwait stock market is the same in the period before and after the enforcement of CMA Law	Reject 0.1%
5	The Amihud Illiquidity Measure (AMI) of Kuwait stock market is the same in the period before and after the enforcement of CMA Law	Reject 0.1%
6	The Price Impact Measure (PIIL) of Kuwait stock market is the same in the period before and after the enforcement of CMA Law	Reject 0.1%
7	The liquidity indicators of large size firms measured by MC are the same in the period before and after the enforcement of CMA Law	Reject 0.1%
8	The liquidity indicators of firms from different market sectors are the same in the period before and after the enforcement of CMA Law	Reject 0.1%

found for smaller firms in the period after the activation of the new market reform. However, in the pre-CMA Law period, smaller firms have higher liquidity and were actively more traded indicating that one of the distinguishing features of the previous period is the identity of major players. The sector variable, according to this model, has no relation and we found no supporting evidence of any difference between the financial and nonfinancial sectors after the activation of new the reforms.

7.3. Possible interpretation for the research's general results

The highly significant evidence of liquidity deterioration in the market following the CMA Law implementation can be interpreted as follows:

- timing of CMA Law activation after the 2008 global financial crisis;
- vast structural change in the market rules that caused negative market reaction;
- overstated legal requirements and punishment provisions on market abuse practices;
- complete absenteeism of market maker role for a very long period since the implementation of the Law;
- weak role of market brokers;
- no representation in the stock market board;
- no commission allowed for all acquisitions deals;
- new and tougher licensing and capital requirements;
- fear in the market among individual investors, during the first year of operation, due to the significantly high number of referral to prosecution in case of presence of any suspicious trading;
- uncertainty status in the market because of the vagueness of the new reform's provisions in relation to trading activities and punishments.

CONCLUDING REMARKS

Liquidity is considered one of the main pillars of stock market efficiency. Higher levels of it are associated with the existence of healthy economy and securities market. This research attempts to shed light on the cost-benefit aspect of new market reforms. Securities regulations aim to enhance the viability of securities markets, protect investors, and increase its efficiency and integrity. The literature documented substantial evidence of market liquidity improvements after enhanced mandatory disclosures and better governance codes (Bushee & Leuz, 2005). Following the global financial crisis, Kuwait Parliament passed new market reforms: the Capital Market Authority Law (CMA) of 2010. The new Law has three main objectives: 1) to improve and upgrade the quality of the financial market, 2) to establish a new regulatory body to monitor securities trading, and 3) to improve financial disclosure quality. After the Law's activation, trading value and volume have dropped significantly and over 49 firms were delisted. In addition, a huge debate occurred among market participants about the viability of this Law, which had led to several amendments during 2013 and 2014. Therefore, this research seeks to assess the feasibility of the CMA Law by focusing on the liquidity dimension of market performance and efficiency. We specifically address the debate of whether the implementation of the Law has led to the foreseen improvements in market efficiency.

We developed eight hypotheses to address the main questions of the research. In the first question, we explored the trends of market liquidity in the periods before and after the CMA Law to detect any significant difference. In the second question, we explored whether the changes in liquidity measures in the period after the activation of the CMA Law are of equal magnitude across firms of different sizes and sectors.

For the 195 listed firms in Kuwait Boursa, both parametric t-test and Mann-Whitney U test revealed highly significant difference across the six liquidity measures, indicating liquidity deterioration after the activation of the Law.

The results of two OLS regression models, which we used to regress two of the liquidity measures (PIIL and TV), were highly significant at the 0.1% level. The CMA law has caused significant deterioration on market liquidity. Post-CMA Law smaller firms were more affected than larger cap firms. The liquidity of smaller firms was lower than that of larger firms after the activation of the CMA Law. The results indicate that the regulatory burden caused market participants to reduce trading and have led many public firms to be delisted.

An important indication of the results should lead policy makers to review the Law, the bylaws, and the practices of the regulatory body, since an important aspect of the market performance was hindered by the Law enactment. This important result should be addressed and further investigated in future research. Proper measures should be taken by policy makers to provide proper exemptions for smaller firms against tough regulations.

The abovementioned results are consistent with the argument that heavy and overstating regulations can have an adverse effect on the market. Cumming et al. (2011) argued that vague regulations create inefficiency to traders and investors and reduce their confidence in the market place. Securities laws should facilitate stock exchange's growth and development, and hence improve market efficiency and liquidity.

The passage of the CMA Law did not induce any improvement in market liquidity evident by the highly significant test results. On the contrary, market efficiency was negatively affected by the CMA Law, as market liquidity is considered as one of market efficiency pillars. The post-CMA test period extended up to seven years with no evidence of improvements in market indicators. Our results are consistent with

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the firm's performance deterioration in the post-CMA Law period. Therefore, we highly recommend an urgent revision of the Capital Market Authority Law, bylaws and procedures to enhance market performance. In addition, further research should be devoted to this topic to enhance the quality of the market regulations in Kuwait.

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