

**Informational efficiency in the GCC stock markets:
Practical issues and possible solutions**

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Abstract:

It is the objective of this paper to (i) assess the informational efficiency of the GCC stock markets; (ii) identify the potential barriers to higher market efficiency and (iii) discuss the best practices in order to improve it.

Some of the studies concluded that GCC stock markets are already weak-form efficient. Most of the studies concluded that a lot remains to be done in order to reach weak-form efficiency. Stock markets in the GCC region are generally characterized by an enormous lack of efficiency, especially when compared with markets in developed countries. The (i) lack of equity culture; (ii) thin trading; (iii) lack of reliable information; (iv) non-harmonized accounting standards and (v) excessive government ownership of listed companies are some of the reasons behind such findings. Higher market efficiency can be achieved by: (i) strengthening financial regulation; (ii) liberalization of the stock market; (iii) promoting financial integration and (iv) imposing thoughtful transaction costs.

1. Introduction: on the role of efficient stock markets in transitional economies

The role of stock markets is central in the process of economic transition. A stock market is considered as a barometer for the economy; where market forces set prices rather than central planning organization. Besides the fact that a well-functioning stock market can ensure the transfer of ownership from the state to the private sector, it also provides the necessary resources to fund the economy. And so, if stock prices accurately reflect all available information, new investment capital goes to its highest-valued use, and no "good" investment goes unfunded (Bauer 2004).

The first section of the present paper aims at assessing the informational efficiency of the GCC stock markets and shows whether they are efficient enough to ensure a successful economic transition. In the second section, some of the potential barriers to higher informational efficiency are presented. The last section deals with the best practices that could improve the informational efficiency of the GCC stock markets.

2. Assessing the informational efficiency of the GCC stock markets:

Most of the tests that are presented below are concerned with whether the GCC stock markets are weak-form efficient or not. As it was the case for almost all emerging stock markets around the world, empirical evidence from the GCC region has produced mixed results. While some of the studies pronounced in favor of weak-form efficiency, other studies rejected such a result and stated that a lot remains to be done before reaching that level.

2.1 Empirical evidence in favor of weak-form efficiency

We shall start by reviewing empirical evidence that generated results in favor of weak-form efficiency. (Abraham, Seyyed, and Alsakran 2002) examined three Gulf markets which are Kuwait, Saudi Arabia and Bahrain using the variance ratio test and the runs test. The data consisted of weekly index values during the period of October 1992 until December 1998. Unlike other studies, Abraham et Al used the (Beveridge and Nelson 1981) methodology to adjust for infrequent trading. This adjustment eliminated the main source of rejection of the random walk hypothesis. They concluded that price changes are independent for all three markets.

(Moustafa 2004) examined the behavior of the United Arab Emirates' stock market using serial correlations and runs tests. The data consists of daily prices of twenty-nine individual stocks listed in the Abu Dhabi Securities Market (ADSM), thirteen individual stocks listed in the Dubai Financial Market (DFM). The study covered the period of October 2001 until September 2003. Empirical results reveal that the returns of 40 stocks out of the 43 behave randomly. Moustapha concluded that the United Arab Emirates stock market is weak-form efficient.

(Marashdeh and Shrestha 2008) examined the United Arab Emirates stock market using the unit root (Augmented Dickey-Fuller and Phillips-Peron tests). Data consisted of daily stock market index over the period August 2003 to April 2008. Both tests failed to reject the null hypothesis of a unit root in the sample data. Marashdeh and Shrestha concluded that the United Arab Emirates stock market is weak-form efficient.

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(Asiri 2008) examined the Bahrain Stock Market (BSE). Different techniques have been used to perform the tests, such as unit root, Dickey-Fuller tests, autoregressive integrated moving average (ARIMA) and exponential smoothing. Data consists of daily prices of forty listed companies in the BSE index during the period of June 1990 until December 2000. Asiri found that all daily stock prices follow a random walk and concluded that the Bahraini stock market is weak-form efficient.

(Bley 2011) examined the predictability of six GCC stock markets. The study applied the (ADF, PP and KPSS) Unit Root tests, the (Ljung and Box 1978) autocorrelation test, the (Lo and MacKinlay 1988), (Chow and Denning 1993) and the (Wright 2000) Variance Ratio tests. In addition, a battery of ARCH models has been applied. Data consisted of daily, weekly and monthly stock price indices during the period of 2000 through 2009. Results from both the ADF and the PP tests are in favor of a Unit Root in almost all markets. However, the more robust KPSS test indicates opposite results for all six markets. Results from the (Ljung and Box 1978) test confirms the presence of daily autocorrelation in all six markets, However on the weekly and the monthly basis, the results are mixed. (Lo and MacKinlay 1988) test indicates that stock markets of Bahrain, Kuwait, and the UAE do not follow a random walk regardless of the data frequency. (Chow and Denning 1993) indicates that only the Saudi Arabian stock market follows a random walk and that on the daily basis. Even if there is a lot of evidence against weak-form efficiency in the GCC stock markets, the selected ARCH models have failed producing significant forecasting.

(Asiri and Alzeera 2013) investigated the efficiency in the Saudi Arabia stock market using the unit root Dickey-Fuller test, Pearson correlation test, autocorrelation test (Durbin-Watson test) and Wald-Wolfowitz Runs test. Data consisted of daily closing values of sixteen indices, the Tadawul All Share Index (TASI) and fifteen other sectorial indices during the period of October 2006 until November 2012. Unit root test suggests that the examined data clearly follow a random walk with very few exceptions. Pearson correlation test suggests that the current daily prices changes of the indices are independent from each other. Durbin-Watson test suggests no positive autocorrelations between the residuals in any of the examined indices. Finally, and in contrast with the previous tests, the runs test suggests mixed results. Asiri and Alzeera concluded that the Saudi Arabia stock market is weak-form efficient.

2.2 Empirical evidence against weak-form efficiency.

On the other hand, several studies found that the GCC stock markets were not weak-form efficient. (Butler and Malaikah 1992) examined both the Kuwaiti and the Saudi Arabian stock markets using the autocorrelation and the runs test for serial independence. The study was performed on 36 Kuwaiti stocks during the period of October 1986 until December 1988. And on 35 Saudi Arabian stocks during the period of June 1986 until September 1989. When using the autocorrelation test, Butler and Malaikah found that Twenty six out of the thirty six Kuwaiti stocks are positively auto correlated. In contrast, all thirty five Saudi stocks exhibit negative and statistically significant autocorrelations. When using the runs test, they found that Fourteen out of thirty six Kuwaiti stocks violate the independence assumption, while all 35 Saudi stocks violate the independence assumption. They concluded that: *"The Kuwaiti market is similar to other thinly traded stock markets. In contrast, the Saudi market exhibits much more serial dependence than either the Kuwaiti market or other active or thinly traded stock markets"* (Butler and Malaikah 1992, 209). Such inefficiencies are much more operational than informational.

(Dahel and Laabas 1999) examined the behavior of four GCC stock markets: Bahrain, Kuwait, Oman, and Saudi Arabia. They compared between the results of three different testing techniques which are: Unit root test, variance ratio test and regression test for autocorrelation of returns. Data consisted of weekly stock price indexes during the period of September 1994 until April 1998. Dahel and Labaas concluded that both Unit root and variance ratio tests gave results in favor of the weak form hypothesis, and that for all the tested markets. However, the regression test for autocorrelation of returns rejected the weak-form hypothesis for all four countries.

(Dahel 1999) compared the volatility of eight Arab stock markets (Bahrain BSE, Egypt ESE, Jordan AFM, Kuwait KSE, Morocco CFG, Oman MSM, Saudi Arabia NCFEI and Tunisia BVMT) with two emerging markets (India and Mexico BMV) and three developed markets (Japan Nikkei, United Kingdom FT-100 and United States DJIA). The study applied Ljung-Box Q-statistic to test for autocorrelation in returns. It also applied the Coefficient of Variation and the (Schwert 1990) method in order to measure the volatility of returns. Data consisted of weekly stock price indices from October 1994 to November 1998. Results from the autocorrelation test indicate that only Jordan stock market did follow a random walk. The Coefficient of Variation indicates that among the eight Arab stock markets, Tunisia was the most volatile and Morocco the least volatile. When seen as a group, the eight Arab stock markets seem to be as volatile as emerging and developed markets. The Schwert method indicates that the Arab stock markets exhibit the lowest volatility of returns when compared to developed and emerging markets. It also suggests that the strongest correlations in returns are between the GCC countries.

(Hassan, Al-Sultan, and Al-Saleem 2003) examined the Kuwaiti Stock Exchange using the EGARCH and GARCH-M methods to account for time-varying risk premia in the KSE. The study was performed on the daily stock index data from 1995 to 2000. They found that the KSE is weak-form inefficient, even though the efficiency improved at the end of 1990s.

(Simpson 2004) examined the efficiency of the six GCC markets using the autocorrelation test and the ARCH model. Data consisted of daily stock prices from January 2000 to November 2003. It was found that there is a strong interdependence between these six markets. Results also suggest that all of the six markets are weak-form inefficient.

(Squalli 2005) examined the Abu Dhabi stock market using the variance ratio test, runs test, unit root and Cointegration. Data consisted of daily sectorial indices for the ADSM (banking, hotels, industry, insurance, and services) from September 2001 until July 2005 and for the DFM (banking, insurance, investment, and services) from March 2000 until September 2005. Variance ratio test suggests that all sectors from both indices do not follow a random walk, except for the banking sector in the DFM. Runs test suggest that returns are not distributed randomly for all sectors except for the banking one in the ADSM. Cointegration test suggest the existence of a long-run equilibrium between the banking and the services index across the ADSM and the DFM. Squalli concluded that the United Arab Emirates stock markets are weak-form inefficient.

(Smith 2007) studied the characteristics of five Middle Eastern stock markets namely, Lebanon (BLOM), Oman (MSM), Jordan (ASE), Kuwait (KSE) and occupied Palestine (Israel TASE). The study applied the (Chow and Denning 1993) Multiple Variance Ratio test. Data consisted of weekly closing stock price indices from October 1996 to June 2003. Results indicate that only stock markets of occupied Palestine (Israel), Jordan and Lebanon follow a random walk. The study concluded that these three markets are weak-form efficient.

(Elango and Hussein 2008) applied the Kolmogorov-Smirnov and the Runs test on seven stock markets (ADSM, DFM, SICO, DSM, KWSE, MSM and TASI) from all six GCC countries. Data consisted of daily stock price indices from October 2001 until October 2006. Results from the Kolmogorov-Smirnov test indicate that returns from all seven markets do not follow a normal distribution. Results from the Runs test indicate that none of the seven stock markets did follow a random walk. The study concluded that GCC stock markets are weak-form inefficient.

(Alharbi 2009) examined all six stock markets of the GCC which are Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates. The author used both linearity (Autocorrelation Function test, Ljung-Perice test and the runs test) and nonlinearity (Kaplan, HinichBispectrum and White's Neural Network) testing techniques. Data consisted of daily closing prices of the following indices: National Bank of Abu Dhabi (NBAD), Tadwul All Shares Index (TASI), Kuwait Stock Exchange (KSE), Doha Stock Exchange (DSE), Muscat Stock Market (MSM) and Bahrain Stock Exchange (BSE). Due to data availability, the testing period varied from a market to another, covering a period from 1995 to 2008. Alharbi rejected the hypothesis of linearity and concluded that: *"Evidence of nonlinearity in GCC stock markets can be strongly claimed and hence this can clearly be considered as a contradiction to the EMH in its weak-form"* (Alharbi 2009, 106).

(Al-Barrak 2009) investigated the day of the week effect in the Saudi, the Kuwaiti and the UAE stock markets using the Analysis of variance test (ANOVA). Data consisted of daily stock prices ranging from January 2002 to December 2005. Al Barrak confirmed the presence of the day of the week effect and concluded that these markets are weak-form inefficient.

(Al Janabi, Hatemi-J, and Irandoust 2010) study was among the few studies to test for the semi-strong form of market efficiency in the GCC countries. Data consisted of the Standard and Poors' emerging market indices for Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates from April 2006 to March 2008. First, the study applied the (Ng and Perron 2001) Unit Root test which revealed that the GCC markets are weak-form efficient. Then it applied the (Granger 1969) causality test and the (Hacker and Hatemi-J 2006) Bootstrap simulation in order to overcome the issues of non-normality and ARCH effects. Results indicate that: *"Neither the oil price index nor the gold price index causes the equity price indexes of the six GCC markets"* (Al Janabi, Hatemi-J, and Irandoust 2010, 52). The study concluded that the GCC equity markets have reached the semi-strong level of market efficiency.

(Abdmoula 2010) used the GARCH-M to examine the evolving efficiency of eleven Arab stock markets that are Saudi Arabia, Kuwait, Tunisia, Dubai, Egypt, Qatar, Jordan, Abu Dhabi, Bahrain, Morocco and Oman. The study was performed on the daily prices of their respective national indices for varying periods ending in March 2009. The study found that all eleven markets are weak-form inefficient (Abdmoula 2010).

(Ulussever, Yumusak, and Kar 2011) revisited the day of the week effect in the Saudi Arabian stock market. The study applied the GARCH model on daily closing stock price indices and that from January 2001 to December 2009. The study found that: *"All of the differences between the mean returns of Saturday and each other trading day are significantly different from zero"* (Ulussever, Yumusak, and Kar 2011, 17). These findings are similar to those from previous studies, confirming the existence of the day of the week effect in the Saudi Arabian stock market.

(Al Ashikh 2012) examined the Saudi Arabia Stock Exchange using the autocorrelation test, runs test and GARCH model. Data consisted of daily closing prices of the Tadawul All Shares Index (TASI) from December 1999 to January 2010. Al Ashikh noticed the presence of the day of the week effect. He concluded that the Saudi Arabia stock market is weak-form inefficient (Al Ashikh 2012).

(Al-Ajmi and Kim 2012) tested the Random Walk Hypothesis in seven GCC stock markets by applying the (Chow and Denning 1993), (Kim 2006), (Kim and Shamsuddin 2008) and (Chen and Deo 2006) Multiple Variance Ratio tests. Data consisted of daily and weekly stock indices during the period of December 1999 through February 2010. Results indicate that there is mixed but strong evidence against the Random Walk Hypothesis in all seven markets on the daily and weekly basis, even after adjusting for thin trading. The study concluded that GCC stock markets are weak-form inefficient.

(Budd 2012) reexamined the efficiency of the Saudi Arabian stock market namely, Tadawul using the Variance Ratio test and the Runs test. Data consisted of daily stock price indices of each sector from the Tadawul exchange, and that during the period of April 2007 through May 2011. Results from the Variance Ratio test indicate that the Random walk hypothesis is rejected for all indices. Results from the Runs test indicate that only the Banking, Building, Insurance and Telecommunication sectors do follow a random walk. The study concluded that the Saudi Arabian Tadawul is weak-form inefficient.

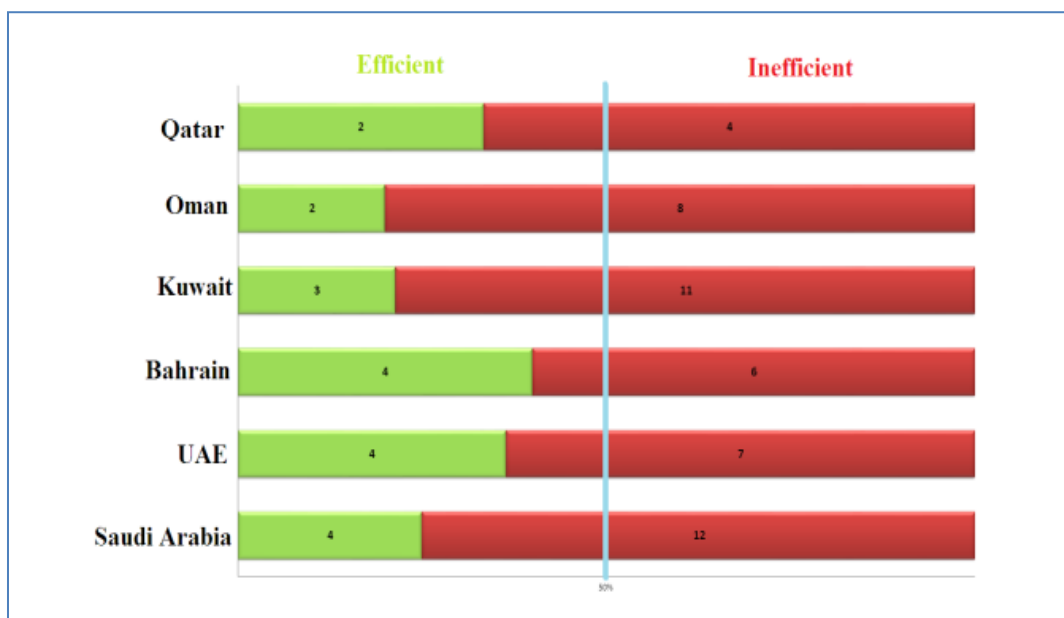
(Elbarghouthi, Qasim, and Yassin 2012) revisited the Omani stock market (ASE) by applying the Runs test. Data consisted of daily stock prices from five indices in ASE namely, general, banking, industry, insurance and services. The study was performed during the period of January 2000 through December 2008. It was found that none of the five indices did follow a random walk.

(Rejichi, Aloui, and Nguyen 2014) shed light on six countries from the MENA region namely, UAE, Saudi Arabia, Kuwait, Turkey, occupied Palestine (Israel) and Jordan. The test was performed using the Hurst Exponent. Data consisted of daily closing prices of six stock market indices and twenty-six sector indices and that during the period of 2000 until 2007. Results indicate that the degree of efficiency among all indices varied through the testing period. Significant improvement was noticed at the end of the testing period. However, none of the indices could reach weak-form efficiency.

2.3 Summing up:

Figure 1 brings results from the above 24 selected studies, altogether. Of course this is not an exact measure, as there are many other similar studies that were dropped. But it allows us to get a general idea about the status of the GCC stock markets. Let us take the example of Saudi Arabia, among a total number of 16 tests, only 4 tests pronounced in favor of weak-form efficiency. Figure 1 shows that more than half of the tests concluded that the GCC stock markets did not reach yet weak-form efficiency. The difference in the results is explained by the difference of robustness of each test. Generally, the more robust the test is, the more it captures inefficiencies. Without a minimum level of informational efficiency it would be difficult to reach allocative efficiency; if investors had access to all available information about listed firms, they would redirect their investment toward the most profitable opportunities. And so, the improved information will improve resource allocation and accelerate economic growth.

Figure 1: Sum up of 24 selected studies on market efficiency in the GCC region.



Source: Elaborated by the authors based on the above 24 selected studies.

3. Potential barriers for informational efficiency:

As we have seen from the previous section, the GCC stock markets are struggling to reach weak-form efficiency. On the long path of improving market efficiency, we first have to identify the existing obstacles. It is the objective of the present section to discuss the main features of GCC stock markets and the difficulties they are facing.

Lack of equity culture. The first European stock exchange was founded in 1531 in Antwerp, Belgium. The first US stock exchange was founded in 1790 in Philadelphia. Stock exchanges at that time appeared because of a natural need and from an investment culture that was already present a long time ago. These stock markets took time to develop and slowly absorb the large number of financial products that are traded nowadays. On the other hand, stock exchanges in emerging countries and especially in Arab countries like the GCC and North Africa were created mostly by the will of the government and not by an arising natural need from individuals who were seeking capital and individuals who could afford that capital. That is why the stock exchange is considered as a relatively new and foreign concept in countries that used to live mainly on oil incomes. And so, these stock markets did not attract the expected number of participants to make it function properly. The lack of equity culture among individuals means that there might be at least one potential individual investor that is not participating in the stock exchange.

(Nasra 2007) is one of the few studies that dealt with this issue. In fact, the problem of the equity culture in the Arab and Muslim countries is still uncovered and need to be put under study. (Mensi 2012) indicated that the lack of equity culture slows investors' reaction to new information, which could be translated in less efficient stock exchanges. Other studies suggest that the operational and informational efficiency of a given stock market is largely determined by the number of market participants. In addition, stock markets do not run well without the integration of financial products such as futures. Due to poor equity culture in these countries, much of the sophisticated financial products are not yet integrated and even if they exist they are not largely traded.

The simple fact of establishing a stock exchange is not enough to make it run. A battery of measures and policies should be taken in order to promote the equity culture. Some of the basic solutions are the vulgarization of stock exchange concept to the general public using various types of media. Another measure is the creation of investment clubs where investors can meet and have their own community.

Thin or infrequent trading.

The most common characteristic of emerging stock markets may be thin trading. This is typically the case for all the GCC and North African stock markets. Even some of the more developed stock markets are concerned with this issue especially in the periods of holidays. Thin trading occurs when a given stock market operates with a relatively low number of buyers and sellers. And so, only few transactions will occur. This will result in low liquidity and high volatility. Statistically speaking, (Fisher 1966) was the first to argue that thin trading can generate spurious autocorrelations, which will bias the results of any empirical test that doesn't account for it. Later on, (Miller, Muthuswamy, and Whaley 1994) introduced a robust methodology that allows for corrections of the thin trading effect. Empirical evidence from the previous section, such as the study of (AlKhazali 2011) on the GCC stock markets indicate that after adjusting for thin trading, the majority of the stock markets tend to be more efficient. On the ground, a battery of measures should be taken in order to promote the equity culture for the simple reason to attract all potential investors.

Lack of reliable information.

A stock market is said to be efficient if prices fully reflect all available information (Fama 1970, 383). This definition was established under the assumption that available information is reliable. However, emerging stock markets and especially those of GCC and North Africa are characterized by less reliable information. A stock market lacks of reliable information when companies or institutions do not disclose information to the public in an official way and on a regular basis. And so, there might be an asymmetry between information held by outsiders and insiders. (Chuhan 1994) asserted that foreign investors in emerging market are more concerned with the lack of reliable information than with restrictions of foreign ownership concerning them. (Grossman 2000, 1) stated that: *"On short run, unreliable information can lead to fraud with outside investors as the losers. In the longer term, if public information remains poor, it would seem likely that insider information and behavior would drive prices"*. (Ismail 2002) found that the companies' size, leverage, profitability, industry type and host country are all factors influencing the voluntary disclosure of financial information on the Internet in the GCC Countries.

Non-harmonized accounting standards.

International or foreign investors face a serious handicap regarding the quality and standards of financial information that is released by listed companies in emerging stock markets. Investment decisions have long been based upon the analysis of the fundamentals of a company. But when the financial reporting does not follow the same standards, a major issue will arise and a comparison between different investment alternatives from different countries will be much more complicated. The common solution resides in the adoption of International Accounting Standards (IAS) and International Financial Reporting Standards (IFRS). (Samuels and Piper 1985) defined the harmonization of accounting standards as: *"An attempt to bring together different systems. It is the process of blending and combining various practices into an orderly structure, which produces a synergistic result."* (Zeghal and Mhedhbi 2012) investigated the effect of adopting the IAS/IFRS by 38 developing countries and found that this step had a positive effect on their respective capital markets. (Tarca 2012) stated that such positive effect on capital markets is mainly due to (i) improvement of the comparability and transparency of financial information (ii) reduction of financial statement preparation costs (iii) increasing allocation efficiency (iv) lowering the cost of the capital (v) increasing market liquidity. (Joshi and Al Mudahki 2003) stated that the GCC countries do not have harmonized accounting standards with each other. However they still do not have harmonized accounting standards with the rest of the world; in fact, the IAS/IFRS are adopted by law but not in practice (Aljifri 2013).

Excessive government ownership of listed companies.

Under capitalistic regimes, the government ownership is restricted to key sectors such as banking, energy, military and heavy industries. For the remaining sectors, government ownership has proven to be inefficient on the firm level. Despite that, many emerging capitalistic countries including the GCC countries chose to control large shares of listed companies' capital on their respective national stock markets, mainly to stabilize prices. (Abdi and Huang 2012) found that private-owned stocks as a group were more efficient than government-owned stocks as a group. And so, governments are once again encouraged to promote privatization programs in order to increase the degree of market efficiency.

Short selling ban.

Making profits on the stock market is generally associated with the prices going high. But, when prices go down, investors will not necessarily lose money. There exists a trading strategy that allows investors to make profits even when prices are falling. This strategy consists of short selling; based on the belief that prices are going to fall, a short-seller borrows shares and sells them at the current price, which is believed to be high. When prices fall, the short-seller buys back the same shares at lower prices, and returns them back to the borrower.

However, short-selling is considered as evil. Because short-sellers' success is associated with misfortune and misery for the rest of the market. In fact, the more prices go down, the more profitable short selling is. (Karpoff and Lou 2010) reported that some short-sellers were ready to achieve their ends by spreading rumors and leading prices down. In the case of a bear market, an ordinary correction of prices, mixed with an abusive use of short-selling can cause investors to panic. This was particularly the case of the 2008 financial crisis³. And so, stock market authorities were constraint to ban short-selling whether permanently or temporarily. This was also the case for the GCC regulatory authorities.

On the other hand, (Karpoff and Lou 2010) indicated that short-selling ban can reduce market efficiency. (Beber and Pagano 2013) argued that bans (i) can reduce liquidity, especially for small stock markets (ii) slow down price discovery, especially in bear market phases, and (iii) can delay price adjustment to the intrinsic value and thus lead to overvaluation. On the later point, (Karlsson 2008) argued that while investors who believed that prices are going to rise were allowed to borrow money and buy the stocks in question, investors who believed that prices are going to fall were not allowed to borrow stocks and go short. This will result in an imbalanced situation where bullish investors will have a greater influence on the price formation than the bearish ones. The bottom line is drawn by the SEC chairman, Christopher Cox when he stated that: "Abusive naked short selling is far different from ordinary short selling, which is a healthy and necessary part of a free market. Manipulative naked short selling is one worry investors shouldn't have" (Cox 2008).

Country risk.

Country risk is a term designating a group of risks associated to a country. Those risks include political instability risk, exchange rate risk, economic mismanagement risk, sovereign risk and capital transfer risk. Country risk is a major concern for foreign investors. A country with a higher risk will add substantial risk premiums to returns, and so, it will attract less foreign investors than a country with a lower risk. According to (Bekaert 1995, 99), one indirect way for measuring the country risk is through the secondary-market price of bank debt. However, this measure is not available for all countries. The most common way remains through classifications provided by official institutions. According to (Euromoney 2014), country risk in the Gulf cooperation council is low, and thus is favorable for attracting foreign investors. On the other hand, (Ramady 2014) found that the "Arab spring" had a negative impact not only on the countries where it occurred but also in the neighboring countries. For the GCC countries, events that happened in Bahrain and Oman had a negative impact on the whole Gulf council.

4. Best practices for higher informational efficiency:

After identifying the potential barriers for higher market efficiency, let us now discuss some of the possible solutions for the GCC authorities in order to improve the degree of market efficiency. It is important to note that the following measures are universal, meaning that it applies for all emerging countries who intent to improve the informational efficiency of their respective stock markets.

Strengthening financial regulation. Financial regulation is the ensemble of actions that are taken by the authorities in order to organize the relationship between the different market participants and to ensure the well-functioning of the financial markets. According to the (OECD 2009), financial regulation aims to:

i. Maintain confidence in the financial system: the

whole financial system is built on the mutual trust between market participants. In the absence of confidence the whole financial system will collapse. And so, the first role of the regulatory authorities is to deter such behavior before its occurrence, punish and bring justice back after its occurrence.

ii. Systemic stability;

the role of the regulatory authorities is to reduce the systemic risk; which is the risk of collapse of the entire financial system. In order to do so the authorities are required to monitor, anticipate, and intervene in a timely and informed manner in order to prevent eventual crisis from occurring (ADBI institute 2014).

iii. Safety and soundness of financial institutions that are involved in the intermediation process:

the activity of financial institutions and especially banks is at the center of the regulators' attention. For this purpose, a unique entity has been created in order to supervise and unify the banking standards of operation around the world. It is the Basel Committee on Banking Supervision.

³ See (Beber and Pagano 2013)

iv. **Market integrity and transparency:**

It is also the role of the regulatory authorities to guarantee (i) fair conditions for each of the market participants; (ii) exact, timely disclosures to investors.

v. **Market conduct and investors protection:**

Regulators also aim to deter, punish and bring back justice in case of fraud and market abuse.

The role of the regulatory authorities cannot be restricted to these five objectives. In fact, it has the complete sovereignty and power to intervene when needed. It is important to note that strong financial regulation does not necessarily interfere with the concept of free market and market efficiency; in the opposite, the lack of a comprehensive regulatory framework can reduce market efficiency (Kyla et al. 2009). This has been the case for emerging and particularly GCC and North African stock markets; where the lack of regulation about firm's disclosure for example, dissuaded foreign individual investors from entering these markets. Financial authorities are required to upgrade every single regulatory aspect to reach international standards.

Stock market liberalization.

(Henry 2000, 2) defined stock market liberalization as: "*A decision by a country's government to allow foreigners to purchase shares in that country's stock market*". This is usually achieved by reducing or eliminating both tariff restrictions; such as transaction costs and non-tariff restrictions; such as quotas and licenses.

However, the statement that stock market liberalization has a positive effect on the degree of market efficiency has been put under study. Some studies such as (Ben Rejeb and Boughrara 2013) and (Füss 2005) assert that stock market liberalization not only improves the degree of efficiency but also reduces the probability of financial crises. On the other hand, (Kawakatsu and Morey 1999) found that stock market liberalization has no positive effect on market efficiency. (Mensi 2012, 62) argued that financial liberalization may increase the instability of the emerging stock markets. Hence the market is more open to foreign investors who influence private investment booms and increase uncertainty. (Ranciere, Tornell, and Westermann 2006) indicated that the majority of historical crises were preceded by a period of financial liberalization

Concerning the GCC stock markets, (Bley and Chen 2006, 76) stated that: "*Since 2002, economic reforms and continuing market liberalization in the GCC strongly affect investors' demand for shares, resulting in an almost tripled market capitalization and a more than quadrupled average daily turnover.*". (Bley and Saad 2011) found that international participation in local trades had a rising impact on total volatility. (Al-Ajmi and Kim 2012, 1747) argued that market liberalization measures had little success in attracting foreign investors. Despite the implementation of these measures, the GCC stock markets are still inefficient.

More financial integration.

(Ho 2009) defined financial integration as "*The process through which financial markets in an economy become more closely integrated with those in other economies or with those in the rest of the world. This implies an increase in capital flows and a tendency for prices and returns on traded financial assets in different countries to equalize*". On the financial markets level, integration means that national investors can hold foreign assets and foreign investors can hold national assets. (Balls 1999) indicated that among countries that are fully integrated into world financial markets, assets with identical risk should command the same expected return, regardless of location.

(Hooy and Lim 2013) found that stock markets which are more integrated with the world are also more efficient. And that this positive association is only significant for emerging stock markets. (Al Janabi, Hatemi-J, and Irandoust 2010, 53) stated that facilitating cross-listing of equity securities helps overcoming the problem of thin trading. (Bekaert, Harvey, and Lumsdaine 2002) found that integration is accompanied by (i) larger and more liquid equity markets; (ii) stock returns that are more volatile and more correlated with world market returns; (iii) lower cost of capital; (iv) an improved credit rating; (v) a real exchange rate appreciation and (vi) an increased real economic growth.

Concerning the Gulf countries, financial integration efforts are a part of larger process of integration that started with the creation of the Gulf Cooperation Council in 1981. (Shediak et al. 2011) stated that the six member states of the GCC have more socioeconomic similarities than differences, sharing a common heritage and history. But after more than thirty years of cooperation, a lot remains to be done.

Imposing thoughtful transaction costs.

Previous research suggested that the reduction of transaction costs can improve the degree of market efficiency and that the imposition of high transaction costs will slow economic growth by raising the cost of capital. (Zhang 2001) found that the imposition of high transaction costs will increase return volatility. In addition, market authorities who implement such measure in order to collect higher tax revenues will be deceived; as the increase in the tax revenues will be relatively small compared to the increased level of the tax rate.

However, recent researches have revisited this assumption, and found contradictory results. (Barclay, Kandel, and Marx 1998) found that higher transaction costs stabilized the trading volume, but did not have a significant effect on prices. (Gu and Hitt 2001) found that a decrease in transaction costs will attract more and more uninformed market participants, which will result in higher volatility and higher market risk. That way, the decrease in transaction costs will reduce the degree of market efficiency even if all market participants are perfectly rational. (Baker and Jorgensen 2012) argued that higher transaction costs can have positive effects: (i) An increase in transaction costs can reduce speculation on stock prices,

dissuade short term trading and encourage long term investment; (ii) The impact of higher transaction costs on the cost of capital is very limited and does not have a significant impact on investment; (iii) Available resources after the reduction of the trading volume can be redirected to finance new investments; and (iv) The collected tax revenues may be used for productive public investment, which will increase productivity and growth.

5. Conclusion:

We started by assessing the informational efficiency of the GCC stock markets. Results show that more than half of the tests have produced evidence against weak-form efficiency. The (i) lack of equity culture; (ii) thin trading; (iii) lack of reliable information; (iv) non-harmonized accounting standards and (v) excessive government ownership of listed companies, are some of the main reasons behind such findings. The GCC stock market authorities are highly encouraged to take the necessary measures in order to improve the informational efficiency of their respective stock markets. Some of the most important measures are: (i) strengthening financial regulation; (ii) liberalization of the stock market; (iii) promoting financial integration and (iv) imposing thoughtful transaction costs.

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