Stock Exchanges Alliances in Organization of Islamic Conferences (OIC) Countries

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Abstract

This paper examines the feasibility and economic benefits of stock exchanges alliances among OIC countries. Despite common Islamic culture, OIC local capital market conditions are heterogeneous depending on legal jurisdictions, income level and the maturity of stock market development. Therefore, in this paper, we suggest a set of internationally acceptable standards that aim to provide guidance for the development and implementation of policy irrespective of local differences so that they can form the basis for the development of sound stock exchanges in OIC countries. For the future development of OIC stock exchanges, we propose a bifurcated or two-tier system for blue-chips and small / medium-sized firms. That is, although small and locally operating firms will list shares at local exchanges, larger firms will rely on regional financial centers within Asian, Europe and MENA regions in the long term or a pan-OIC exchange irrespective of where this market will be located in OIC countries.

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1. Introduction

Around the world, stock markets have been undergoing rapid changes in developed and developing countries over the past two decades. Tremendous competition has arisen among major stock exchanges to attract listings and trading volume. They have become increasingly global, with large increases in cross-border capital flows. Listing, trading, and new issuance are concentrating in fewer stock exchanges. Furthermore, trading floors and telephone networks are losing importance because transactions can be conducted via electronic trading platforms of stock exchanges and alternative trading systems[1] (ATSs) due to the recent advances in information and communications technology. As a result, harmonization in the rules for trading systems and stronger technological links have enabled any large corporation to list its stock and raise capital in the market that offers the most available financing, lowest costs, and best liquidity by allowing investors everywhere to access stock market services.

The global trends of consolidations among major stock exchanges are also remarkable. For example, Euronext N.V., the newly established pan-European exchange in 2000, deals with business in several countries including Amsterdam, Brussels, Paris, and Lisbon. The London International Financial Futures and Options Exchange (LIFFE) was also joined into Euronext system (called Euronext.liffe) in 2002, then became the world's biggest derivatives exchange. Most noticeably, Euronext N.V. and New York Stock Exchange (NYSE) group won endorsement for their merger of equals (NYSE

[1] Alternative trading systems (ATSs) reduce transaction costs and provide real-time execution as well as access to global equity markets. In the US, about 10% of equity trading on the NYSE and 30% of NASDAQ volume are mainly handled by Electronic Communications Networks (ECNs, e.g., BrokerTec, REDIBook, E-Crossnet, and Archipelago etc.).

Euronext) in June 2006 by removing a major hurdle for the first transatlantic stock exchange, producing significant benefits for shareholders, issuers and users. NYSE Euronext is now the world's most liquid marketplace, with average daily trading value of approximately $100 billion (€80 billion), and the world's premier listing venue, with total market capitalization of listed companies of $27 trillion (€21,000 billion).

These recent trends are starting to affect stock markets within Organization of Islamic Conference[2] (OIC) countries. As listed in Appendix A, Islamic Development Bank[3] (IDB) had the expert meeting in Jeddah, Saudi Arabia on 26-27 June 2004 on enhancing the capacity and integration of stock markets to promote intra-investment among OIC countries. Notwithstanding, in many of OIC countries, there still exist serious obstacles to stock market development including weak laws and regulations, slow progress on private sector development, a limited supply of institutional investors, and macroeconomic uncertainty.

With few exceptions, OIC countries have not participated in global consolidation waves and are still pursuing a 'made at home' strategy in developing their own stock exchanges. Furthermore, the strong home market preference found for many developed countries demonstrates how difficult it is to generate foreign trading volume within OIC stock markets since most OIC stock markets are small and illiquid even relative to most

[2] The Organization of the Islamic Conference (OIC) is an inter-governmental organization grouping 57 mostly Islamic nations in the Middle East, North and West Africa, Central Asia, Southeast Asia, the Indian subcontinent and South America. Visit main OIC website (http://www.oic-oci.org/) to learn more about the role, the organizational chart, and OIC member countries.

[3] The Islamic Development Bank (IDB, http://www.isdb.org/) has fostered the promotion of economic development and cooperation among its member countries as a primary objective in accordance with the principles of Shari'ah i.e., Islamic Law since its inception in 1976. The prospective member country should be a member of the Organization of the Islamic Conference (OIC).

emerging markets – let alone compared to developed markets. Therefore, Claessens et al. (2000) point out that many of these 'import substitution' approaches in developing stock markets are doomed to fail. Recently, Claessens et al. (2003) suggest the following three survival options – self-survival strategy, linkages, and mergers – for stock exchanges in Central and Eastern European Countries (CEEC), which also provide useful strategic implications with OIC countries.

- *Self-survival strategy* seeks to prosper by themselves by reducing costs and increasing revenues of their own exchanges.
- *Linkages* try to establish some form of cross-border linkages with other exchanges to achieve cost savings from many different sources (economy of scale, sharing system for equity trading, and harmonizing rules and requirements between the exchanges with respect to trading and membership).
- *Mergers and acquisitions* (M&A) merge with, or are taken over by, one or more other exchanges. Mergers hold clear advantages over any linkage due to the irrelevancy of gain distribution, higher credibility, solid and sound cooperation. Two well-known examples of mega-mergers among cross-border exchanges are NOREX[4] and NYSE Euronext.

[4] The NOREX implements a common system for share trading and harmonizes the trading and membership rules and regulations for exchanges in different countries. As of 27 September 2004, securities from Sweden, Denmark, Norway, Iceland, Finland, Estonia and Latvia can be bought and sold through one and the same SAXESS trading system in OMX Exchanges marketplaces in Finland, Estonia and Latvia. Following this development, the stock exchanges of the Nordic and Baltic countries now represent a single market for securities trading in practical terms. The actual implementation of the NOREX alliance involved a mixture of formal mergers between exchanges – illustrated by the merger of the Swedish OM and the Finnish HEX exchanges, and the proposed merger of the resulting exchange with the Danish Stock exchange (a letter of intent was signed in November 2004) – and a number of cooperation agreements.

Although OIC countries share common Islamic culture, regulatory and supervisory arrangements vary between jurisdictions with different legal traditions. Furthermore, local capital market conditions (financial resources, available human capital etc.) are also heterogeneous depending on income level and the maturity of stock market development. Therefore, in this paper, we consider a set of internationally desirable or acceptable standards that aim to provide guidance for the development and implementation of policy irrespective of local differences so that they can form the basis for the development of sound stock exchanges in OIC countries. Furthermore, we try to answer the following important strategic questions. Is it possible for OIC stock markets to achieve the economies of scale and scope needed to compete internationally alone? If not, do they need to join cross-border stock exchanges alliances for survival?

In sum, we expect the emergence of a bifurcated exchanges system, global and local, where blue-chip firms with large market capitalization will be traded or cross-listed in the global stock markets such as London Stock Exchange (LSE) or NYSE Euronext due to migration[5], but stocks in small and medium-sized companies will continue to be traded in local national stock markets within individual OIC countries. We understand that there surely exist various potential advantages of consolidation among OIC stock exchanges – a standardization of trading platforms across exchanges, an increase in market liquidity, and a reduction in market fragmentation – to help minimize the costs and problems associated with cross-border trading in OIC countries.

[5] 'Migration' means that internationalization induces a shift in the trading of international firms out of the domestic stock exchanges and into international stock exchanges because international stock markets have higher trading volumes and lower transaction costs.

Nonetheless, in reality, various impediments to consolidation persist, such as cross-country legal and regulatory differences, changes in corporate governance, high information costs, home country bias[6], and widespread fragmentation of clearing and settlement systems among OIC countries. Most of all, there still remains an issue of nationalism and protectionism, also called the 'national airline syndrome[7]'. Therefore, as matters now stand, it is hard to achieve a single Islamic-based stock exchange or cross-border mergers among OIC stock exchanges on a large scale in the short term. Instead, OIC countries will need to concentrate on creating the market conditions that allow firms to issue and trade shares efficiently, such as improving shareholder rights and the quality of local legal systems. They will also need to enhance corporate governance, accounting, listing and other rules, up to the standards of the international financial markets. In some OIC countries, enforcement of securities market regulation will also need to be strengthened. However, in the long term, we expect that OIC stock markets progress toward a more unified capital market or several regional financial centers by creating the cross-border merging of stock exchanges along with a consolidation of clearing and settlement systems.

This paper is organized as follows. In Section 2 we review the literature on the economic effects of globalization among major stock exchanges together with benefits and challenges facing stock exchanges alliances. Section 3 describes the OIC countries data and econometric analysis to justify the empirical implications and policy

[6] The 'home country bias' in portfolio selection refers to the tendency of investors to predominantly hold locally-listed securities, thereby foregoing opportunities to diversify their portfolios by holding foreign assets.

[7] Although many national airlines perennially lose money, each country tends to have a national airline. Similarly, each country also has a strong desire to have its own regulation of a national stock exchange.

recommendations. Then, we suggest feasible policy guidelines based on empirical results and current OIC capital market conditions in Section 4. Section 5 provides conclusions.

2. Literature review on the globalization and stock exchanges alliances

2.1. The mixed economic effects of globalization efforts in stock exchanges

The empirical evidence of economic effects on the internationalization of stock markets varies considerably among individual countries and has been in a longstanding disagreement among academicians and policy makers. For example, Levine and Schmukler (2006) argue that when a firm cross-lists or issues depositary receipts[8] (DRs) in an international stock exchange (e.g., the NYSE or LSE), the trading of the firm's shares tends to migrate out of the domestic market and into the more advanced international market, which hurts the liquidity of domestic firms. Therefore, the concern among policy makers in emerging stock markets is that internationalization has a negative impact on domestic stock market liquidity and trading volumes, impeding stock market development and potentially lowering future economic growth (King and Levine, 1993; Khan and Senhadji, 2000).

[8] A depositary receipt (DR) is a type of negotiable (transferable) financial security that is traded on a local stock exchange but represents a security, usually in the form of equity, which is issued by a foreign publicly-listed company. One of the most common types of DRs is the American Depositary Receipt (ADR), which has been offering companies, investors and traders global investment opportunities since the 1920s. Since then, DRs have spread to other parts of the globe in the form of Global Depositary Receipts (GDRs) (the other most common type of DR), European DRs and International DRs. ADRs are typically traded on a U.S. national stock exchange, such as the New York Stock Exchange (NYSE) or the American Stock Exchange (ASE), while GDRs are commonly listed on European stock exchanges such as the London Stock Exchange (LSE). Both ADRs and GDRs are usually denominated in U.S. dollars, but can also be denominated in euros.

On the other hand, the empirical evidence does not support the fear that foreign investment liberalization will impede domestic stock market development (For a survey of empirical literature, see Karolyi, 1998). For example, the cross-listings and using depositary receipts in Central and Eastern Europe (CEEC) exchanges on international stock exchanges added credibility to the privatization process, and in that way had positive feedback on the incipient local CEEC stock markets (FEAS, 2001). In addition, the lack of information, capital controls, legal restrictions, discriminatory taxation, and liquidity in emerging stock markets are important barriers to investing in these markets. Therefore, in many developing countries, obstacles often prevent foreign investors from entering the local market. A company can overcome this challenge by cross-listing or issuing a depositary receipt and still encourage investment from abroad without having to worry about barriers to entry that a foreign investor might face.

To better interpret the mixed economic effects on globalization experience across individual countries, Hargis and Ramanlal (1998) develop a theoretical model to examine the impact of international cross-listing on domestic market liquidity and trading volume. Contrary to fears of policy makers in emerging markets, they find that cross-listing on larger more transparent markets, from smaller less liquid markets with greater foreign ownership restrictions, show the greatest enhancement in domestic stock market development because the potential to increase shareholder base is also an important factor for stock market development. More recently, Lau and Mclnish (2002) also find that cross-listing thus far has resulted in a "win-win" situation with volume and liquidity improving in the domestic market even though the foreign market dominates trading.

2.2. Potential benefits and challenges facing cross-border stock exchanges alliances

The integration of stock exchanges produces a number of significant efficiency gains by eliminating the duplication of costly infrastructure, thus reducing the average cost of producing a trade (Cybo-Ottone et al., 2000; Steil, 2001; McAndrews and Stefanadis, 2002; Goldberg et al., 2002; Claessens et al., 2002; Ramos, 2003). For example, accessing a single trading platform instead of two (or more) allows market professionals to save on the hardware, software and skilled human capital necessary to access and monitor separate trading platforms. Integration also allows investors to trade more diversified portfolios, in some cases overcoming the fact that they were previously unaware of the existence of some securities. In addition, integration of national exchanges and the ensuing increase in cross-border trading increases liquidity, as reflected by lower bid-ask spreads, greater trading volumes, and lower volatility.

For example, the creation of a single trading platform made it possible for Euronext N.V. to reduce its operation costs and eliminate the duplication of infrastructure and IT investments across the individual exchanges in Amsterdam, Brussels, Lisbon and Paris. Studies also show that as a consequence of full integration of stock markets, the cost of equity capital for the companies attracting capital through stock exchanges as well as the cost of settling securities transactions will decline by an average of 50 basis points. The European economy may, in turn, grow at an annual rate of 1.1%, thanks to more efficient financing of the economy (London Economics, 2002).

For theoretical work, Di Noia (2001) uses the economic theory of network externalities and a simple-game theoretical framework to explore the issue of competition

among stock exchanges and the possibility of consolidation in the European stock-exchange industry. Di Noia strongly argues that a merger is a clear strategic option for exchanges because it improves welfare, consumer surplus, and total profits as well. This paper also suggests that regulation should guide or favor a merger, eliminating all obstacles to listing and delisting in exchanges and to trading, implementing, in full, remote access; public and exchange regulators should avoid discrimination among national firms and intermediaries and foreign ones. This paper further shows the existence of equilibria where exchanges may decide to achieve full compatibility through implicit mergers[9] and remote access, specializing only in trading or listing services.

However, in reality, of the many attempts at cross-border cooperation between exchanges that have been proposed, few have been implemented, and of those that have been realized, most have failed due to the technological issues as well as governance structures (For the detailed examples of dropped deals, refer to Cybo-Ottone et al., 2000; Steil, 2001; Claessens et al., 2003). In the similar vein, integrating the cross-border exchanges is not an easy task. For example, prior to the creation of Euronext N.V., there were separate trading and clearing platforms in each geographic market. The trading platforms in Brussels and Paris were relatively similar, but differed significantly from the platform used in Amsterdam. Since November 2003, the users of the Paris, Brussels, Amsterdam, and Lisbon exchanges have operated on a single trading platform and a single clearing platform.

[9] An implicit merger between exchanges consists of an agreement between two exchanges such that the securities, originally listed in one exchange, are listed by the other one, and remote access is offered to the traders of each exchange, with reciprocity and without further requirements.

For NOREX, there is an episode of the failed merger negotiations between the three Baltic stock exchanges and the NOREX alliance before a full-fledged implementation of NOREX with a number of cooperation agreements in 2004. Although the merger was likely to increase the liquidity of the listed stocks and provide better capital raising opportunities for the listed local companies, these improvements occurred gradually only for the largest companies. So, the Baltic stock exchanges generated trading fees that could not justify acquisition of the required new and expensive trading system SAXESS. These factors together created little incentives for both parties to proceed with the merger and bear the integration costs that were unlikely to provide fast enough payoff. Therefore, we learn, from the experience of Euronext N.V. and NOREX mergers, that cost efficiencies created by consolidation of a trading platform should be sizeable, timely, merger-specific, and passed on to users.

3. Data and econometric analysis

3.1. Data and characteristics of OIC stock exchanges

We categorize 57 OIC countries into different geographical regions and income groups based on World Bank classifications from *World Development Indicators* 2006 (WDI) database as in Appendix B to examine the feasibility of OIC stock exchanges alliances depending on their current economic conditions and financial infrastructure. To achieve this goal, we collect the following monthly S&P/IFCG price indexes[10] of 15 OIC

[10] According to Standard & Poor's S&P/IFCG index stock selection guidelines, S&P/IFCG price indexes should be well-diversified across different industries and are intended to represent the performance of the most active stocks in their respective stock markets and to be the broadest possible indicator of market movements.

stock markets from January 1999 to March 2003 due to the data availability and their vital economic role to the international community through oil exports, tourism, and financial markets. (a) East Asia & Pacific: Indonesia and Malaysia, (b) Europe & Central Asia: Turkey, (c) Middle East & North Africa: Bahrain, Egypt, Jordan, Lebanon, Morocco, Oman, Saudi Arabia, and Tunisia, (d) South Asia: Bangladesh and Pakistan, (e) Sub-Saharan Africa: Nigeria and Côte d'Ivoire.

When indices are expressed in local currencies, part of the index volatility is induced by monetary phenomena such as changes in anticipated and actual inflation rates. To avoid interpretation problems, all monthly S&P/IFCG price indexes are denominated in US dollars. The source of OIC countries data is the Emerging Markets Data Base (EMDB) published by Standard & Poor's. Most OIC countries belong to low or lower-middle income groups based on World Bank classifications, especially in South Asian and Sub-Saharan African regions. Even in the same OIC members, many of oil-rich kingdoms are classified as high-income non-OECD or upper middle income groups as listed in Appendix B.

In Table 1, we provide characteristics of OIC stock exchanges. Although endowed with high potential for development, the OIC stock exchanges in general are afflicted with comparatively low levels of liquidity reflected in the form of the low number of listed companies, low (market capitalization / GDP) ratio or low (trade volumes / market capitalization) ratio.[11] Furthermore, there were only a few changes in

[11] Unlike other OIC stock markets, we find that the Traded/Cap ratio in Pakistan has been recently exploding. The Pakistan stock market has gone through an unusual times of speculative trading during 2003 and the stock market tumbled more than 40%. Standard & Poor's EMDB database provides market capitalization ($2875.4 million) and traded values ($7716.12 million) in 2003, resulting in Traded/Cap ratio (268.35%).

the number of listed domestic companies with minor exceptions during our sample periods. In fact, low liquidity in OIC stock markets could be attributed mainly to the regulatory frameworks which are yet to be developed and the macroeconomic risks the investors assign to those markets. Among the other causes that explain the shallowness of those markets, the following points could also be mentioned: lack of adequate flow of financial information, lack of product differentiation (scale of economies, differentiation of services), existence of cross-country legal and regulatory differences (differences of listing requirements, accounting diversity), high information costs, cultural and linguistic differences and geographic diversity (SESRTCIC, 2005 and 2006).

In Table 2, we also report summary statistics of monthly S&P/IFCG price index returns in U.S. dollar denominations for 15 OIC stock markets. During our sample periods, most OIC stock markets experienced severe stock markets fluctuations. Turkey and Indonesia have the highest uncertainty in their monthly stock market movements out of OIC stock markets, evidenced by standard deviations of 21.64% and 14.54%. Maximum (minimum) monthly returns for Turkey and Indonesia are 71.29% (-40.52%) and 40.67% (-21.48%), respectively. The Jarque-Bera statistics show that, all of the monthly index returns for OIC stock markets are far from normally distributed except Indonesia, Turkey, Morocco, Saudi Arabia, Bangladesh, and Pakistan.

3.2. Econometric methods and analysis

The main idea behind a stock market alliance is to tap the capital markets of the region without sacrificing any returns. If the risk-return combinations in each market are

strongly correlated[12], a case can be made for strong alliance without one market dominating another market. Therefore, to examine the feasibility of cross-border alliance among OIC stock exchanges, we investigate different co-movements and degree of stock market integration among OIC countries by performing Johansen and Juselius (1990) cointegration tests[13] to study whether stock exchanges alliances will be a good idea in terms of capital market integration among OIC countries. Through cointegration analysis, we highlight the dynamic co-movement among OIC stock markets and the adjustment process towards long-term equilibrium. To start with, we apply two unit root tests, the augmented Dickey-Fuller (ADF) test and Phillips-Peron (PP) test, to see whether our OIC stock markets data are integrated of the same order for cointegration analysis, which tests the existence of a long-run equilibrium relationship between OIC stock markets. Then, we investigate the price linkages within OIC stock markets.

Using the testing procedure for modeling cointegration, we examine the following bivariate cointegrating relationships[14] among different geographical regions of 15 OIC countries based on World Bank classification.

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[12] A reviewer argues that if there is low correlation or no cointegration, it will provide better portfolio diversifications for investors, implying good chance for cross-border exchanges alliance due to more potential economic gains. We believe, however, that this is an only reasonable explanation for purely economic viewpoint. Stock market alliance is complicated process involving conflict of interests (Game theoretic approach might be helpful in this context). Low correlation or no cointegration is strong evidence of market segmentation between countries mainly because of political and many other non-economic factors. As a prerequisite, cross-border exchanges alliance requires closer economic cooperation. Otherwise, countries will not wish to work together to set up an integrated stock market.

[13] A set of monthly OIC S&P/IFCG price indexes in U.S. dollar denominations is said to be cointegrated if they are integrated of the same order and a linear combination of them is stationary. Such linear combination would then point to the existence of a long-term relationship between OIC stock markets.

[14] We use the following abbreviations to denote OIC stock markets. For convenience, we analyze Turkey together with OIC countries located in the Middle East & North Africa due to the data availability and

Geographic regions	Bivariate cointegrating relationships
• East Asia & Pacific	{I-M}
• Europe & Central Asia Middle East & North Africa	{T-B} {T-E} {T-J} {T-L} {T-M} {T-O} {T-S} {T-Tu} {B-E} {B-J} {B-L} {B-M} {B-O} {B-S} {B-Tu} {E-J} {E-L} {E-M} {E-O} {E-S} {E-Tu} {J-L} {J-M} {J-O} {J-S} {J-Tu} {L-M} {L-O} {L-S} {L-Tu} {M-O} {M-S} {M-Tu} {O-S} {O-Tu} {S-Tu}
• South Asia	{Ba-P}
• Sub-Saharan Africa	{N-C}

Table 3 reports the results of ADF and PP unit root tests. Unlike OIC stock prices indexes, we find that unit roots in monthly percentage returns of stock indexes are rejected at the 1 percent level, suggesting that changes in stock prices are stationary. Table 4 assembles the test results for only those combinations that reveal significant cointegration linkages (fully-detailed estimation results are available from the author upon request).

We find that the significant cointegrating relationships only exist within East Asia & Pacific {I-M}, and Europe & Central Asia and Middle East & North Africa, where associated with {T-B}, {T-E}, {T-J}, {E-M}, {J-L}, {J-S}, {L-M}, {M-O}, and {M-S}, highly sensitive to the specific model assumptions regarding data trends (none, linear, and quadratic) and types (intercept and trends). It appears that there are some

close geographic distance. We only report the bivariate results of cointegration tests because our purpose of tests is to examine the feasibility of cross-border alliances within geographic regions between OIC stock markets exchanges. East Asia & Pacific (I = Indonesia, M = Malaysia), Europe & Central Asia and Middle East & North Africa (T = Turkey, B = Bahrain, E = Egypt, J = Jordan, L = Lebanon, M = Morocco, O = Oman, S = Saudi Arabia, Tu = Tunisia), South Asia (Ba = Bangladesh, P = Pakistan), and Sub-Saharan Africa (N = Nigeria, C = Côte d'Ivoire).

connections between Europe & Central Asia and Middle East & North Africa stock markets, evidenced by Turkey's significant cointegrating relationships with Bahrain, Egypt, and Jordan. We argue that long-run equilibrium relations within East Asia & Pacific and Middle East & North Africa regions have become stronger because the financial liberalization of these regions has progressed more rapidly and more intensively (Yu and Hassan, 2007).

However, despite close geographic distances there is no strong statistical evidence of cointegration in other regions such as South Asia and Sub-Saharan Africa, implying the market segmentation of these OIC regions. Table 5 also substantiates that the pair-wise correlations among OIC stock market returns are still substantially low without respect to geographic distances except for a correlation coefficient (0.5789) between Indonesia and Malaysia. Especially Bangladesh has generally negative correlations with other OIC stock markets. All in all, we observe relatively segmented OIC stock markets at present. Obviously, the European stock markets presented a high degree of integration and efficiency before the euro and the euro has clearly added to the pressures from technological change and globalization for the creation of new Euronext alliances among Europe's exchanges. However, the level of integration and development among OIC stock exchanges is relatively weak as shown in Table 4 and 5.

In general, OIC capital market integration is expected to go through the following phases: a) Foreign investment inflow, b) Further development and strengthening of local market participants, c) Active cross-border investing and investment opportunities. Then, we may think of setting up cross-border exchanges alliances (e.g., regional financial centers) within Asian, Europe and MENA regions in the long term based on the results of

cointegration tests. The reason is that most OIC stock markets are currently fragmented, as evidenced by weak cointegrating relationships and substantially low correlations. We also believe that regional cross-border integrations (mergers), such as NOREX and Euronext, among high and middle income OIC groups within Asia, Europe, and MENA regions should be recommended rather than loose forms of cooperation (linkages) such as associations, federations, unions, or joint ventures.

4. Policy implications and strategic decisions for OIC exchanges survival

4.1. Major problems in OIC stock markets

Any sound capital market should be fair, efficient, and transparent as prerequisites so that investors are assured that the rules of the game are fair, equitably applied and effectively enforced. However, the development of equity markets in many OIC countries is being hampered by lack of investor protection and transparent securities trading. In addition to the problem of inadequate or non-existent rules and regulations, there are also serious enforcement problems. Many OIC countries lack an effective system for enforcing laws, regulations, and self-regulatory organization (SRO) rules governing the operation of equity markets. Other obstacles faced by policy makers in OIC countries include 1) low quality or inconsistent accounting standards, 2) poor or non-existent corporate governance standards, 3) lack of investor compensation schemes, 4) insufficient knowledge of basic capital market rules and practices among investors, 5) a weak bankruptcy system, 6) the absence of large and active domestic institutional investors, 7) inadequate clearing and settlement systems, 8) grey areas of legislation due to inconsistencies in the legal and regulatory framework, 9) lack of competition in

domestic financial markets. Clearly, this list is not exhaustive, but it highlights the principal problems encountered in trying to develop strong capital markets in OIC countries.

More recently, the development of access via Internet routing is permitting investors to trade through web-sites, in some cases directly with each other, bypassing traditional exchanges. Financial policy makers around the globe have recognized that the implementation of internationally acceptable standards and best practices is essential for the successful integration of OIC countries into the world financial systems. Policy makers from emerging markets increasingly appreciate the importance of strong domestic capital markets for economic growth and higher living standards (King and Levine, 1993; Khan and Senhadji, 2000).

4.2. Policy agenda for the development of OIC stock exchanges

We suggest the following policy agenda for the development of OIC stock exchanges. An adequate legal framework for the effective regulation and functioning of exchanges should be enforced to protect investors and to operate fair, efficient and transparent stock markets by taking into account international standards. In addition, some of OIC countries have sought to ensure that only one major exchange is in operation for the need to establish one big and liquid domestic market, or to restrict the trading of shares in companies that are listed on another exchange. However, it is unlikely that these policies will be successful in the long term in shielding a market from diversification and competition. Ultimately, both firms and investors will benefit from increased competition within and between OIC stock markets.

Therefore, it is necessary to issue depositary receipts (DRs) traded on international stock markets in dollars or euros to further enhance liquidity and raise capital for internationalized OIC-based firms. For similar purpose, OIC firms can also think of cross-listing their stocks on more developed exchanges. In the long run, it could be also helpful to facilitate foreign investment by allowing dollar (or euro)-denominated trading within the OIC stock markets.

Importantly, many stock exchanges have been considering demutualization[15] - that is, becoming for-profit organizations - to survive in an increasingly competitive environment. As such, to pursue internationalization of stock exchanges within OIC countries, demutualization and initial public offerings (IPO) need to be taken into consideration. Even if OIC stock markets are to be successfully integrated into the world financial system they must have an efficient and robust domestic financial infrastructure that conforms to internationally acceptable standards and best practices. Although many local differences in market structures exist, global standards and best practices are at the

[15] Demutualization is the process through which a member-owned company becomes shareholder-owned; frequently this is a step toward the initial public offering (IPO) of a company. World stock exchanges have offered another striking example of the trend towards demutualization, as the London Stock Exchange (LSE), New York Stock Exchange (NYSE), Toronto Stock Exchange (TSE) and most other exchanges across the globe have either recently converted, are currently in the process, or are considering demutualization. The merits of demutualization for an exchange in a developing market are particularly debatable (Steil, 2001; Lee, 2002). It may allow an exchange 1) to modernize its technology; 2) to obtain a governance and management structure that is more agile, flexible, and swift in its ability to respond to industry and market conditions; 3) to avoid concentration of ownership power in a particular group of exchange participants; 4) to create a catalyst for pursuing new business strategies; 5) to improve financial decision-making by ensuring that resources are allocated to business initiatives and ventures that enhance shareholder value. The demutualized exchanges, however, will require significantly more regulation than mutual exchanges not because of the difficulties of self-regulation, but rather due to likely anti-competitive behavior.

heart of the effective development of stock exchanges in any developing market such as OIC stock exchanges. Although these issues already figure high on the agenda of policy makers from the more advanced markets, they are becoming increasingly important to those from OIC countries and other emerging markets as well.

Despite the progress of financial markets integration, the OIC stock markets are still governed by different legal systems, and other major obstacles – legal, regulatory, tax or technical – to cross-border activity within the OIC countries. Moreover, protectionist pressures are still at work. Therefore, to achieve a major integration of OIC stock markets it will be necessary to ensure equal access to market infrastructure, such as trading platforms, clearing and settlement systems, and to remove unfair tax measures which represent discrimination against cross-border suppliers. Harmonization of rules essential for investor protection is also important for both supply- and demand-side reasons. The key factor in the securities market integration process is the integration of market infrastructures, i.e., integration of securities trading, clearing and settlement systems. Full integration of financial sector infrastructures means that trading and settlement costs related to transactions are the same for the investor, regardless of the place of issue of the security. This means that the same rules apply to all market players, they have equal access to the market, and they are treated equally there.

Therefore, it appears that a merger between exchanges can directly benefit their users and final investors in several ways. First, a merger broadens both broker and investor's trading opportunities by offering them direct access to several markets at a lower cost. This reduces 'home bias' effects by facilitating cross-border trading and allowing investors to hold more diversified portfolios. Second, it may benefit final

investors by lowering their implicit trading costs through the provision of greater liquidity as reflected by lower bid-ask spreads and higher trading volume. The greater liquidity may also be associated with lower volatility of stock prices.[16]

4.3. The lessons from the past

The evolution of the exchange industry in OIC countries is still of great uncertainty at this time. Nonetheless, should OIC countries plan to develop their own stock exchange? There are additional strategic decisions to make. The main purpose of stock exchanges alliances is to promote cooperation, harmonization and integration among OIC stock exchanges. If so, will the OIC stock exchanges merge? Is there enough probability for many of them to survive? What about integration with off-OIC exchanges such as European-based stock exchanges such as London Stock Exchange (LSE)? Is it better for the exchanges to have an agreement among them or to decide unilaterally to trade shares listed in other exchanges and/or to offer remote access?

The past experience tells us that competition led some exchanges to a) sign strategic alliances which eventually failed (e.g., Euroquote and Eurolist; London Stock Exchange (LSE)-Deutsche Borse (DB) alliance (1998); the Euro-8 alliance (2000); iX among LSE, DB and Nasdaq; the EuroNM circuit), b) to merge (e.g., DTB-SOFFEX into EUREX; Helsinki Stock Exchange-Finnish Options market (SOM); the Vienna Stock

[16] Politics is a key factor in determining whether, and how, securities exchanges consolidate in the future. Many exchanges threatened by a fall in trading volumes, or a decline in the number of companies listed on them, have sought to survive by linking with other exchanges. However, few have been willing to sacrifice their identity by merging with other exchanges to form larger combined entities although the case of Euronext N.V., with its subsidiary exchanges Euronext Amsterdam, Euronext Brussels, Euronext Lisbon, and Euronext Paris, provides an example of how a merged institution can still retain the identities of its constituent parts.

Exchange and OTOB, Copenhagen Stock Exchange and FUTOP; the acquisition of Matif by SBF and of MIF by Borsa Italiana), c) to launch takeovers (e.g., Paris Bourse over Matif and OM over the London Stock Exchange), d) to compete in market architecture, to allow remote membership, e) to modify prices and trading hours, and f) to sign cooperation and technological agreements. In many cases the exchanges changed their juridical forms and ownership structures. Some of them listed their shares by the process of demutualization and privatization. However, the lessons from the past seem to be negative. Most of the past alliances have failed after some time mainly due to the governance and technical problems.

Although OIC stock exchanges have pursued several loose forms of strategic alliances (linkages) among OIC stock exchanges or with developed stock exchanges (see SESRTCIC, 2005 & 2006), it seems to be very difficult to achieve the cost savings if each participating exchange uses a different market model because of the duplications in software development. In addition, linkages may give raise to various coordination and hold-up problems. A linkage requires that the participants enter into contracts that specify, for example, how the costs of any investments to upgrade the platform would be shared. Each participant, however, has an incentive to minimize its own contribution to development costs and free-ride on the investments made by others. This is likely to lead to under-investment in the absence of a clear ex-ante commitment on how such costs will be shared.

However, creating a fully-specified contract that covers all possible contingencies will be also very challenging. This will continue to be the case because of a problem that is unavoidable in linkages, as opposed to mergers, between securities exchanges, namely

the difficulty of creating credible contractual commitments between cooperation partners. An alliance is unlikely to achieve the same level of staff-cost savings as a merger, for example, because each exchange will be likely to retain its own corporate and head-office functions.

4.4. Future blueprint of OIC stock exchanges

The absolute majority of OIC stock exchanges can be characterized by a typical low liquidity and also by a small number of primary issues. The unified platform should allure more investors. The future in the functioning of OIC stock markets is envisaged as an affiliated branch of another foreign exchange. In this way it would enable the successful local companies to carry on business with their shares also in lucrative foreign markets and would lead to the improvement of advertising and to a greater interest in the OIC capital markets and in the investment in OIC companies within the sphere of foreign investors.

It is clear that the current worldwide trend is to carry on business outside borders. However, there is a question whether the OIC capital markets are interesting for foreign investors and what it can offer to them. From the viewpoint of future revenues, the OIC capital markets are certainly interesting because it is undeveloped and has a great potential of growth. In comparison with the situation abroad it will certainly offer its investors much higher capital revenues in the near future in comparison with advanced and stable capital markets.

We expect OIC capital markets to be more closely integrated with other exchanges. All developed stock markets go ahead in this sense at a rapid pace. Various

global exchanges are being developed as, for instance, Euronext and NOREX, with which national exchanges are integrated at a local level, and surely OIC countries, like other countries, will not avoid this development in the future. Another possibility is the mutual integration of all OIC exchanges suffering from a scarcity of liquidity and little or no primary issue offers in the market. As a consequence, an effectively functioning liquidity market or regional financial centers within Asia, Europe and MENA regions could be established. In the future, it is likely that among individual OIC markets there will be no obstacles preventing investors and issuers to pass from one exchange to another. As such, the future does not need to be seen only in the unified big exchange[17] but also in a large number of smaller exchanges, which will be competing with one another (Baran, 2004).

In sum, we should not forget that national sentiments and institutions may prevent the concentration process. National bourses, just like national airlines, have a strong symbolic value and therefore do not disappear easily. We expect that a two-tier market will develop. On the one hand, there are shares issued by small and medium-sized companies which will be issued and traded at a local or regional level, while shares of larger companies, the so-called blue chips, will increasingly be issued at a pan-OIC level and traded on an OIC-wide basis as well. Apart from these two segments, there is a truly global segment for shares of, for example, multinational companies whose shares are listed in large finance centers like New York, London, and Tokyo. The ultimate

[17] The location of an exchange still remains a vital political symbol for the success of a financial center. However, trading systems can be both located and registered in jurisdictions that are different from the locations in which most of the market participants using the trading systems are located due to remote access.

outcome of the integration process of OIC stock exchanges, a truly unified stock market, could be reached via a system of common access, followed by market convergence, then joint markets and finally one operational market[18] in the long term.

5. Conclusions

The future development of OIC stock markets will depend on the degree of macroeconomic stability, the strength of legal systems, and the quality of information in each country. Therefore, OIC stock exchanges should improve the basic infrastructure for the financial sector, including stronger legal rights for creditors and share holders, better information, greater disclosure, well-governed institutional investors, and supporting public and private institutions. So far, the European Union (EU) has involved the creation of a borderless capital market among its members which are of different sizes, regulatory philosophies, and market cultures with centralized regulatory policymaking and decentralized enforcement. In this regards, the past experience from the EU can provide OIC policy makers with a role model to development of OIC stock exchanges.

Through a more open and integrated OIC capital market, a number of benefits are expected for both investors and the corporate sector to share risk and allocate capital effectively. Investors will benefit from higher risk-adjusted returns on savings, through enhanced opportunities for portfolio diversification and more liquid and competitive

[18] Lee (2002) explains the evolution of European exchanges as follows. At the most simplistic level, the structure of the exchange in Europe started off as a monopoly (with a single municipal exchange), swung to a more competitive environment (with competing municipal exchanges in the same country), returned to a monopoly (with a single consolidated national exchange), became more competitive (with competing national exchanges and other types of trading systems), and is now becoming more consolidated and monopolistic again (with potentially just one or a few European exchanges). This evolution process should provide OIC policy makers with useful implications to the future development of OIC stock exchanges.

capital markets. The corporate sector will benefit from generally easier access to financing capital because competition in the financial intermediation sector will offer corporations a wider range of financial products at attractive prices (London Economics, 2002). These conditions will, in turn, contribute to guaranteeing financial stability in the OIC countries and facilitating economic growth.

Appendix A: Recommendation of the expert meeting on enhancing the capacity of financial markets to promote intra-investment among IDB member countries

Experts from twelve institutions (securities commission, stock exchanges and international Islamic financial institutions) from member countries of the Islamic Development Bank (IDB), met at the IDB headquarters in Jeddah, Saudi Arabia on 26-27 June 2004 and made the following recommendations.

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1. CAPACITY BUILDING AND INVESTMENT PROMOTION

- In order to attract capital flows into member countries, the primary focus should be on developing and strengthening investment fundamentals, which remain vital criteria for investors.
- Priority should be given to actions aimed at strengthening relatively under-developed stock markets.
- Better infrastructure to enhance the capacity of secondary markets should be developed.
- Ways and means should be found to keep transaction costs as low as possible.
- Conditions for promotion of cross- listings should be created.
- Acceptable levels of transparency and disclosure standards should be ensured.
- Markets should be opened to foreign investors.
- Free flow of funds to and from member countries should be encouraged and facilitated.
- Commitment for effective regulatory and supervisory frameworks should be ensured.
- Quality listings should be secured.
- The role of saving institutions and institutional investors as a way of strengthening the capacity of member countries' stock markets should be ensured.

2. INTEGRATION OF STOCK MARKETS

- There should be a focus on enhancing linkages between relatively well-developed markets.
- Cross-border listing should be encouraged.
- MOUs between IDB member countries should be facilitated with a view to enhancing inter markets linkages and boosting intra-investment flows.
- Alliances/mergers between stock markets should be encouraged to harmonize their institutional frameworks and to stimulate stock markets' activities.
- Alliances between market intermediaries should be encouraged to tap the liquidity pools, rather than having the individual investors do the cross-border trading.
- Sound policies (monetary/fiscal/exchange rate policies) should be developed to ensure currency stability.
- Central banks should be engaged in the implications of monetary policies on the domestic capital markets.
- The IDB could play a facilitating role in the networking of stock exchange managers, regulators, and the Islamic finance infrastructure institutions.

Source: Economic cooperation among member countries (Chapter 2), IDB Annual Report 1425H (9 February 2005)

Appendix B: The OIC member countries and World Bank classification based on geographic regions and income groups

Geographic regions	Full members (N = 57)	Membership Year	Income groups	OIC countries (N = 15) analyzed in this paper
East Asia & Pacific	Indonesia	1969	Lower middle income	Indonesia
	Malaysia	1969	Upper middle income	Malaysia
Latin America & Caribbean	Suriname	1996	Lower middle income	
	Guyana	1998	Lower middle income	
Europe & Central Asia	Turkey	1969	Upper middle income	Turkey
	Azerbaijan	1991	Lower middle income	
	Albania	1992	Lower middle income	
	Kyrgyzstan	1992	Low income	
	Tajikistan	1992	Low income	
	Turkmenistan	1992	Lower middle income	
	Kazakhstan	1995	Lower middle income	
	Uzbekistan	1995	Low income	
Middle East & North Africa	Algeria	1969	Lower middle income	Bahrain
	Egypt	1969	Lower middle income	Egypt
	Iran	1969	Lower middle income	Jordan
	Jordan	1969	Lower middle income	Lebanon
	Kuwait	1969	High income: nonOECD	Morocco
	Lebanon	1969	Upper middle income	Oman
	Libya	1969	Upper middle income	Saudi Arabia
	Morocco	1969	Lower middle income	Tunisia
	Palestine	1969	-	
	Yemen	1969	Low income	
	Saudi Arabia	1969	High income: nonOECD	
	Tunisia	1969	Lower middle income	
	Bahrain	1970	High income: nonOECD	
	Oman	1970	Upper middle income	
	Qatar	1970	High income: nonOECD	
	Syria	1970	Lower middle income	
	United Arab Emirates	1970	High income: nonOECD	
	Iraq	1976	Lower middle income	
	Djibouti	1978	Lower middle income	
South Asia	Afghanistan	1969	Low income	Bangladesh
	Pakistan	1969	Low income	Pakistan
	Bangladesh	1974	Low income	
	Maldives	1976	Lower middle income	
	Brunei	1984	High income: nonOECD	
Sub-Saharan Africa	Chad	1969	Low income	Nigeria
	Guinea	1969	Low income	Côte d'Ivoire
	Mali	1969	Low income	
	Mauritania	1969	Low income	
	Niger	1969	Low income	
	Senegal	1969	Low income	
	Sudan	1969	Low income	
	Somalia	1969	Low income	
	Sierra Leone	1972	Low income	
	Gabon	1974	Upper middle income	
	Gambia	1974	Low income	
	Guinea-Bissau	1974	Low income	
	Uganda	1974	Low income	
	Burkina Faso	1975	Low income	
	Cameroon	1975	Low income	
	Comoros	1976	Low income	
	Benin	1982	Low income	
	Nigeria	1986	Low income	
	Mozambique	1994	Low income	
	Togo	1997	Low income	
	Côte d'Ivoire	2001	Low income	

Note: The OIC full members are divided among income groups according to 2004 gross national income (GNI) per capita. The groups are: low income, $825 or less; lower middle income, $826 – 3,255; upper middle income, $3,256 – 10,065; and high income, $10,066 or more) based on World Bank classification. Out of 57 OIC full member countries, Palestine is not included in World Bank's *World Development Indicators 2006* (WDI) database.

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Table 1. Characteristics of OIC stock exchanges

The tables describe the characteristics of OIC stock exchanges. Market summary data is collected from S&P's Emerging Market Data Base (EMDB).

	Market Capitalization / GDP (%)			Value Traded / Market Capitalization (%)			Number of Listed Domestic Companies (End of period)		
	1999	2001	2003	1999	2001	2003	1999	2001	2003
Indonesia	46	14	23	5.17	3.44	7.11	58	66	58
Malaysia	184	136	162	2.08	2.58	4.15	147	135	105
Turkey	61	32	28	11.58	21.33	21.89	58	60	46
Bahrain	108	83	100	0.52	0.10	0.58	15	13	11
Egypt	36	25	33	6.98	5.43	5.11	66	72	52
Jordan	71	70	108	1.40	0.68	2.08	41	34	29
Lebanon	12	8	6	0.20	0.41	0.44	5	6	6
Morocco	39	27	30	1.06	1.60	0.75	18	21	19
Oman	27	13	23	1.00	1.66	2.42	34	29	27
Saudi Arabia	38	40	73	2.52	3.50	5.53	21	21	27
Tunisia	13	12	10	0.57	1.23	0.55	13	18	19
Bangladesh	2	2	3	0.95	3.95	3.22	49	60	59
Pakistan	11	7	20	16.51	74.52	268.35	53	42	41
Nigeria	8	11	16	0.34	1.50	2.45	28	27	32
Côte d'Ivoire	12	11	12	0.07	0.06	0.30	12	12	12

Table 2. Summary statistics

The table describes summary statistics of monthly S&P/IFCG price index returns (sample periods: January 1999 – March 2003) for 15 OIC stock markets. The *p*-values are reported in square brackets for Jarque-Bera normality tests.

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Jarque-Bera Normality Tests	
Indonesia	0.0058	-0.0005	0.4067	-0.2148	0.1454	0.7063	2.9285	4.2509	[0.1194]
Malaysia	0.0057	-0.0070	0.3446	-0.1290	0.0866	1.1137	5.8767	28.1283	[0.0000]
Turkey	0.0149	-0.0409	0.7129	-0.4052	0.2164	0.7046	3.8846	5.8830	[0.0528]
Bahrain	-0.0036	-0.0034	0.1087	-0.1121	0.0360	0.1477	5.3561	11.9813	[0.0025]
Egypt	-0.0195	-0.0246	0.1897	-0.1262	0.0682	0.9020	3.8968	8.6254	[0.0134]
Jordan	0.0001	-0.0079	0.1252	-0.0699	0.0351	0.9111	4.5844	12.3897	[0.0020]
Lebanon	-0.0108	-0.0142	0.2139	-0.1882	0.0782	0.5788	4.2505	6.1708	[0.0457]
Morocco	-0.0092	-0.0171	0.1103	-0.0837	0.0459	0.4041	2.3889	2.1819	[0.3359]
Oman	0.0005	-0.0237	0.1889	-0.1184	0.0659	1.0984	4.1283	12.9605	[0.0015]
Saudi Arabia	0.0123	0.0136	0.1052	-0.1260	0.0421	-0.3848	4.0949	3.8059	[0.1491]
Tunisia	-0.0026	-0.0134	0.2039	-0.0842	0.0547	1.4430	5.9548	36.2524	[0.0000]
Bangladesh	-0.0052	-0.0150	0.1793	-0.1317	0.0592	0.6326	3.7142	4.4853	[0.1062]
Pakistan	0.0173	0.0020	0.3566	-0.2228	0.1234	0.7719	3.5157	5.6292	[0.0599]
Nigeria	0.0172	0.0015	0.2780	-0.2085	0.0811	0.6728	5.1134	13.3386	[0.0013]
Côte d'Ivoire	-0.0056	-0.0171	0.1796	-0.1064	0.0553	1.0744	4.6471	15.5772	[0.0004]

Table 3. Unit root tests for OIC stock markets

The table reports the results of ADF and PP unit root tests. The null hypothesis (H_0) of ADF and PP tests is that the monthly OIC index have a unit root. We include an intercept and trend in test equations. The optimal numbers of lags and bandwidths of ADF and PP tests are chosen based on the values of Schwarz Information Criteria (SIC) and Newey-West automatic bandwidth selection methods. MacKinnon one-sided *p*-values are reported in square brackets. Fully-detailed estimation results are available from the author upon request.

Countries	The augmented Dickey-Fuller (ADF) test				The Phillips-Perron (PP) test					
	Levels (OIC index)		1st difference (OIC index returns)		Levels (OIC index)			1st difference (OIC index returns)		
	t-statistic	Prob.	*t*-statistic	Prob.	Adj. *t*-stat	Prob.	Bandwidth	Adj. *t*-stat	Prob.	Bandwidth
Indonesia	-1.5628	[0.4939]	-6.4575	[0.0000]	-1.6424	[0.4538]	1	-6.4396	[0.0000]	5
Malaysia	-1.8552	[0.3503]	-6.0029	[0.0000]	-1.9893	[0.2905]	1	-6.0029	[0.0000]	0
Turkey	-1.3306	[0.6082]	-6.9559	[0.0000]	-1.5036	[0.5236]	4	-6.9558	[0.0000]	3
Bahrain	-1.3516	[0.5983]	-8.9731	[0.0000]	-1.2031	[0.6661]	4	-9.0801	[0.0000]	3
Egypt	-1.3060	[0.6196]	-4.7439	[0.0003]	-1.4041	[0.5729]	3	-4.6886	[0.0004]	1
Jordan	-1.3458	[0.6011]	-6.5201	[0.0000]	-1.4411	[0.5548]	3	-6.5548	[0.0000]	3
Lebanon	-2.8484	[0.0589]	-8.6001	[0.0000]	-2.8836	[0.0544]	4	-12.3573	[0.0000]	20
Morocco	-1.9247	[0.3186]	-7.5124	[0.0000]	-2.1705	[0.2193]	2	-7.5124	[0.0000]	0
Oman	-1.9151	[0.3229]	-6.9438	[0.0000]	-1.9928	[0.2890]	3	-6.9447	[0.0000]	3
Saudi Arabia	-1.7872	[0.3825]	-6.9378	[0.0000]	-1.8001	[0.3763]	3	-6.9395	[0.0000]	2
Tunisia	-0.9764	[0.7548]	-6.2181	[0.0000]	-0.6306	[0.8541]	4	-9.2476	[0.0000]	5
Bangladesh	-1.4328	[0.5589]	-7.2412	[0.0000]	-1.2901	[0.6272]	2	-7.3071	[0.0000]	6
Pakistan	-1.6044	[0.4729]	-6.8073	[0.0000]	-1.7348	[0.4079]	2	-6.8073	[0.0000]	0
Nigeria	-0.7098	[0.8348]	-6.1916	[0.0000]	-0.1618	[0.9363]	49	-11.4578	[0.0000]	48
Côte d'Ivoire	-2.2208	[0.2017]	-7.1502	[0.0000]	-2.3246	[0.1684]	5	-7.3046	[0.0000]	5

Table 4. Johansen – Juselius cointegration tests

The following table summarizes the estimation results of Johansen – Juselius cointegration tests for only those combinations that reveal significant cointegration linkages among OIC stock markets.

Model Assumptions:	(a)	(b)	(c)	(d)	(e)
Data Trend	None	None	Linear	Linear	Quadratic
Test Type	No Intercept No Trend	Intercept No Trend	Intercept No Trend	Intercept Trend	Intercept Trend
Number of cointegrating relations by models (columns):					
1. Indonesia and Malaysia					
Trace statistic	0	0	2	0	2
Max-Eigenvalue statistic	0	0	0	0	0
2. Turkey and Bahrain					
Trace statistic	0	0	2	0	0
Max-Eigenvalue statistic	0	0	0	0	0
3. Turkey and Egypt					
Trace statistic	2	1	2	1	2
Max-Eigenvalue statistic	2	1	0	1	0
4. Turkey and Jordan					
Trace statistic	0	0	1	0	0
Max-Eigenvalue statistic	0	0	0	0	0
5. Egypt and Morocco					
Trace statistic	1	1	1	0	1
Max-Eigenvalue statistic	1	1	1	0	1
6. Jordan and Lebanon					
Trace statistic	0	0	0	0	2
Max-Eigenvalue statistic	0	0	0	0	0
7. Jordan and Saudi Arabia					
Trace statistic	1	0	0	0	0
Max-Eigenvalue statistic	1	0	0	0	0
8. Lebanon and Morocco					
Trace statistic	2	1	2	0	0
Max-Eigenvalue statistic	2	1	2	0	0
9. Morocco and Oman					
Trace statistic	1	0	0	0	1
Max-Eigenvalue statistic	1	0	0	1	1
10. Morocco and Saudi Arabia					
Trace statistic	1	1	2	0	0
Max-Eigenvalue statistic	1	0	0	0	0

Table 5. Correlation coefficients of monthly returns for 15 OIC countries

This table shows the correlations coefficients among OIC stock markets returns over the period January 1999 through March 2003. Returns are monthly percentage (%) returns of stock indexes.

	Indonesia	Malaysia	Turkey	Bahrain	Egypt	Jordan	Lebanon	Morocco	Oman	Saudi Arabia	Tunisia	Bangla desh	Pakistan	Nigeria	Côte d'Ivoire
Indonesia	1.0000	0.5789	0.0471	0.3033	0.0589	-0.0158	0.1270	0.0766	0.3084	0.2073	0.0492	-0.0349	0.0040	0.1197	0.2794
Malaysia		1.0000	0.1285	0.2183	0.1659	0.0032	0.1071	0.0568	0.2767	0.1672	-0.0875	-0.0838	0.0484	0.1303	-0.0900
Turkey			1.0000	0.3621	0.2244	0.0977	0.0984	-0.1732	-0.1802	0.0914	0.0282	-0.1016	0.3092	0.0290	0.0545
Bahrain				1.0000	0.3200	0.2500	0.0575	0.0124	0.2798	0.2599	0.1635	-0.2338	0.3222	-0.0413	0.1455
Egypt					1.0000	0.2143	0.2707	0.1244	0.2225	0.1097	0.1837	-0.1406	0.1276	-0.0017	0.0998
Jordan						1.0000	0.0833	0.0103	0.0060	0.0025	0.0285	-0.2186	0.1466	0.0223	0.0342
Lebanon							1.0000	0.1734	-0.1955	0.0398	-0.1859	0.1225	0.0516	0.2190	0.2410
Morocco								1.0000	0.2374	0.0063	0.0246	-0.1061	-0.2007	0.1520	0.2866
Oman									1.0000	0.0711	-0.0115	-0.2007	-0.0497	-0.2932	0.0674
Saudi Arabia										1.0000	-0.1601	-0.2674	0.2245	0.1108	-0.0317
Tunisia											1.0000	0.0104	0.1715	-0.0263	-0.0339
Bangladesh												1.0000	-0.1874	0.2262	0.1477
Pakistan													1.0000	-0.0475	-0.1057
Nigeria														1.0000	0.0850
Côte d'Ivoire															1.0000