Financial Integration and Shock Vulnerability: Implications for the Cost of Capital in Emerging MENA Markets

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ABBREVIATIONS

ASE: Amman Stock Exchange

AMOC: Alexandria Mineral Oils Company

CDVM: Conseil Déontologique des Valeurs Mobilières

CSE: Casablanca Stock Exchange

EU: European Union

ESE: Egyptian Stock Exchange

EGX: The Egyptian Exchange

GDP: Gross Domestic Product

GMM: Generalised Method of Moments

ICAPM: International Capital Asset Pricing Model

IOSCO: International Organization for Securities' Commission

IRF: Impulse Response Function

MENA: Middle East and North Africa

OECD: Organization for Economic Cooperation and Development

OLS: Ordinary Least Squares

PVAR: Panel Vector Autoregression

SEC: Securities Exchange Commission

TSE: Tunisia Stock Exchange

UAE: United Arab Emirates

US: United States

EXECUTIVE SUMMARY

Considerable efforts have been recently devoted in the MENA region to improve foreign portfolio investment in the region's stock markets. Financial liberalization policies have thus included among others plans to revitalize the various stock markets in order to encourage international participation in listed companies, increasing thus the inflow of capital and lowering subsequently the cost of capital in the domestic MENA financial markets. Moreover, and despite their small market capitalization, during the past ten years, MENA countries' equity markets have exhibited performance characteristics parallel to other emerging markets in similar stages of development. Record market capitalization growth rates can be noted in Morocco and Jordan, and to a lesser extent in Egypt and Tunisia over the 1998-2011 period. This is due to massive privatization plans introduced in those countries, to the extensive sale of government assets to private firms, and to the considerable efforts devoted recently in enhancing the depth and liquidity of the four stock markets. Nonetheless private capital and portfolio flows to the region have remained relatively limited, and MENA financial systems remain relatively opaque in comparison to other emerging markets. Intra-regional and international portfolio investments have been made mainly in those MENA economies that have implemented policies conducive to strengthening the operational framework of the domestic financial market.

With the above in mind, this study sheds new light on the impact of international financial integration on the cost of capital in the MENA emerging countries during financial and non-financial crises episodes. Compared to other emerging market economies and as noted above, MENA's attractiveness to international investors has been quite modest before the financial crisis, even in the better performing countries of Morocco, Tunisia, Jordan and Egypt. Those MENA countries have recently liberalised more than others investment regulation, removed ownership restrictions as well as trade and capital flows barriers.

Moreover, this study adds to the exiting finance literature by providing new insight on the micro-economic implications of international financial integration on the firm's cost of capital in the MENA stock markets of Egypt, Jordan, Morocco and Tunisia. For this purpose we develop annual proxies for the firm-level cost of equity in a panel of the four emerging markets. We then compute annual financial integration indicators capturing long run linkages, the dynamics of country exposure to international shocks (differentiating between fundamental and shift contagion), and ownership structure. Finally, we analyse the impact of international integration on the microeconomic cost of capital using a set of dynamic panel models with appropriate control variables and robustness checks. Our results provide new information on the impact of international financial integration on the real sector. In the process, we will also be able to monitor integration levels and to compare the cost of capital among the four MENA countries.

Our dataset is taken from the Thomson Reuters database and covers four MENA countries: Tunisia (47 firms), Egypt (200 firms), Morocco (68 firms) and Jordan (220 firms). For each listed firm, we retrieve the daily close price, the value of the market index as well as firm level information on a yearly basis: total number of shares outstanding, financial structure (shareholders equity to total assets), annual turnover (annual traded volume divided by the number of outstanding shares) and total ownership from foreign institutional investors.

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For each company included in the sample, we estimate the cost of equity through the International Capital Asset Pricing Model (ICAPM). Under this approach, the cost of equity depends on a risk free rate and on a term equal to the global market risk premium (the price of risk) multiplied by the stock's beta (the amount of risk). The model is computed on a rolling annual basis where observed betas represent the stock's exposure to systematic risk in each specific time-period.

For each financial market, we compute rolling annual correlation coefficients as a first proxy for financial shock exposure. We use a time-varying risk-decomposition model in order to monitor country exposure to international shocks on equity markets. We begin with a standard asset pricing model. We measure a market's exposure to global spillovers by running a set of VAR models for each year and each market. We measure exposure to joint endogenous shocks occurring during the global crisis by implementing Baur and Fry's (2009) methodology. This method captures system-wide contagion based on a panel data modelling of market linkages. Pooled indices are regressed on the global market index over the entire sample period. Joint abnormal linkages are detected by observing the size of the fixed time effect test statistics. The fixed time effect is included for the crisis period only (from 2007 until the end of the sample in 2011). Finally, we adopt a panel structural VAR modelling approach in order to model the impact of an increase in financial integration on the international cost of equity for MENA firms, controlling for turnover, numbers of shares and financial structure.

Our empirical results show that:

(1) In each MENA individual country in our sample, an increase in financial shock exposure leads to an increase in the cost of equity. In the case of all four MENA countries included in our sample, the coefficients associated with pairwise correlation, VAR inverted p-values and systematic risk exposure levels are all positive and significant.
(2) These results are confirmed by the impulse response function analysis showing the response of the cost of equity ICAPM to a one standard deviation in one of the shock vulnerability variables, for each model estimated on a country basis.
(3) For each country in our sample, our results highlight that an increase in shock exposure leads to a temporary increase in the cost of equity. Overall, these results suggest that financial integration leads to a higher cost of equity in turmoil periods. This mechanism operates through portfolio adjustment: under financial integration, systematic risk exposure shifts from a domestic CAPM where systematic risk is measured by the variance of the local index, to an International CAPM where investors determine expected returns by monitoring firm exposure to international shocks on the global market index. Given that international betas of emerging market firms are generally lower, this mechanism leads to a lower risk premium. However, if the gains from diversification are offset by a large increase in the variance of the international market or cancelled by a sudden increase in co-movements, this causality becomes positive. In other words, the adoption of international pricing models by emerging market investors can lead to a higher cost of equity for listed firms in periods of externally induced financial stress.
(4) From a policy perspective, these results suggest that while financial integration carries long run benefits, it goes along with destabilization costs in times of international crises periods. In addition, our results show that destabilization is not confined to the

macroeconomic level but also affects the microeconomic cost of capital. This may partly explain the observed drop in aggregate investment in the region in the aftermath of the global crisis (given that the cost of capital negatively affects the net present value of investment projects).

(5) The policy challenge is therefore to protect emerging economies from hot capital flows and global liquidity shocks, while reaping the benefits of integration. Given the already low levels of financial integration observed in the region, financial repression and capital controls would not help improve resilience to international shocks. Rather, we argue that improving the transparency of financial information would help protect these economies from sudden psychological shifts among domestic and international investors.

The policy implications of the study are as follows:

(1) The development of MENA's financial sector should be a top priority on the reform agenda. Stock and bond markets are sometime virtually absent and firms cannot raise capital domestically or internationally.

(2) Increased financial integration within the MENA region would lower the vulnerability of those markets to international shocks and is expected to bring considerable benefits to MENA's investors by rendering capital more mobile across borders and by lowering the cost of capital. As a result, a more liquid capital market would offer lower borrowing costs for MENA's corporate sector wishing to raise funds locally and would lower its exposure to the short term speculative capital inflows.

(3) Increased financial liberalization within the MENA region is also expected to enhance regional intermediation of financial resources through close integration of financial markets and increased access of MENA's investors to regional financial markets to finance investment. In addition, MENA's investors will have access to a variety of risks adjusted rates of return to enhance the efficiency of portfolio allocation and diversification, which will foster the efficiency of MENA's financial markets. Increased liberalization within the MENA region is expected to attract important portfolio investments to the region for diversification purposes.

(4) The enhancement of MENA's local capital markets, especially stock markets is also another way to dampen the effects of the global financial crises, and will help reduce the exposure of private corporations to currency mismatches due to foreign borrowings. Those corporations will be able to raise funds locally and reduce their exposure to external financial shocks. They will also reduce any currency mismatch (exchange rate risk) in their balance sheets, and dampen the implications of any sudden outflows of capital emanating from the current crisis or from other financial shocks.

(5) One way to protect from the mechanisms highlighted in this study would be to implement stricter informational disclosure regulation (accounting norms, auditing requirements), in order to prevent waves of irrational mimetic herding among uninformed investors. Previous studies have shown that imperfect information results in mimetic trading. This induces significant increases in the correlation between the domestic and international market indices during crisis periods, ultimately leading to an increase in the cost of equity. Such transparency reforms should be made in the context of increased south–south trade and financial integration, which would help consolidate the markets and minimize contagion vulnerability. Recent examples of such policies in emerging countries include the integration of bond markets in South

East Asia, or the ongoing prudential reforms in South Korea, Malaysia and Indonesia. International financial integration should remain a long run policy objective. However, the associated risks should be fully acknowledged and tackled via domestic reforms and international cooperation.

(6) In order to improve financial market integration MENA policy makers need to analyse how the firm-level cost of equity would react in periods of international or regional financial crisis. This would provide a better understanding of the benefits and costs of equity market integration.

EXECUTIVE SUMMARY (FRENCH)

Des efforts considérables ont été consacrés à la région MENA pour améliorer les investissements de portefeuilles étrangers dans les marchés boursiers de la région. Les politiques de libéralisation financières ont donc inclus, parmi d'autres, des projets pour revitaliser les différents marchés boursiers afin d'encourager la participation internationale dans les entreprises cotées, augmentant ainsi l'afflux des capitaux et diminuant le coût du capital sur les marchés nationaux de la région MENA. Par ailleurs, et en dépit de leur faible capitalisation boursière, pendant les dix dernières années, les marchés boursiers des pays de la région MENA ont montré des caractéristiques de performance parallèles à d'autres marchés émergents dans des stages de développement similaires. Des taux de croissance records de la capitalisation boursière peuvent être observés au Maroc et en Jordanie, et dans une moindre mesure, en Egypte et en Tunisie pendant la période 1998-2011. Cela est dû à des plans de privatisation massifs introduits dans ces pays, et à la vaste vente de biens publics à des entreprises privées, et aux efforts considérables consacrés récemment pour renforcer l'efficacité, la profondeur, l'intégration et la liquidité des quatre marchés boursiers. Néanmoins, le capital privé et les flux de portefeuilles dans la région sont restés limités. Les investissements de portefeuilles intra régionaux et internationaux ont été réalisés principalement dans les économies de la région MENA qui ont mis en œuvre des politiques favorables au renforcement du cadre du fonctionnement du marché financier intérieur.

Compte tenu de ce qui précède, cette étude met en évidence l'impact de l'intégration financière internationale sur le coût du capital dans les pays émergents de la région MENA pendant les périodes de crises financières et non financières. Comparée aux autres économies émergents et comme indiqué ci-dessus, l'attractivité de la région MENA pour les investisseurs internationaux a été très modeste avant la crise financière, même dans les pays les plus performants du Maroc, la Tunisie, la Jordanie et l'Egypte. Ces pays de la région MENA ont récemment libéralisé, plus que d'autres, le règlement des investissements, et ont enlevé les restrictions sur la propriété ainsi que les obstacles aux flux commerciaux et de capitaux.

De plus, cette étude ajoute à la littérature financière existante en donnant une nouvelle perspective sur les implications micro-économiques de l'intégration financière internationale sur les coûts de capital de l'entreprise dans les marchés financiers d'Egypte, de Jordanie, de Maroc et de Tunisie. Dans ce but, nous développons un certain nombre de *proxy* annuels pour le coût des fonds propres au niveau des entreprises dans un *panel* composé des quatre marchés émergents, en utilisant différentes méthodologies. Nous calculons ensuite un nombre d'indicateurs mesurant l'intégration financière annuelle qui capturent les liens de long terme, la dynamique de l'exposition des pays aux chocs internationaux (distinguant la contagion fondamentale de la contagion décalée), et la structure de propriété (distinguant la catégorie de la stratégie des investisseurs). Enfin, nous analysons l'impact de l'intégration internationale

sur le coût de capital microéconomique en utilisant un ensemble de modèles de données dynamiques avec des variables de contrôle appropriées et des tests de robustesse. Nos résultats fournissent de nouvelles informations sur l'impact de l'intégration financière internationale sur le secteur réel. Nous serons également capable de surveiller les niveaux d'intégration et de comparer le coût de capital entre les quatre pays de la région MENA.

Notre base de données est tirée de la base de données Thomson Reuters et couvre quatre pays de la région MENA: la Tunisie (47 entreprises), l'Egypte (200 entreprises), le Maroc (68 entreprises) et la Jordanie (220 entreprises). Pour chaque entreprise cotée, nous récupérons le prix quotidien de clôture, la valeur de l'indice du marché ainsi que les informations sur le niveau de l'entreprise sur une base annuelle: le nombre total d'actions en circulation, la structure financière (capitaux propres au total des actifs), le chiffre d'affaires annuel (le volume des titres annuels échangés divisé par le nombre d'actions en circulation), et la propriété totale des investisseurs institutionnels étrangers.

Nos résultats empiriques montrent que :

(1) Dans chaque pays de la région MENA de notre échantillon, une augmentation de l'exposition aux chocs financiers conduit à une augmentation du coût des fonds propres. Dans le cas où tous les quatre pays de notre échantillon sont inclus, les coefficients associés à une corrélation par paire, les valeurs p de VAR inversées, et les niveaux d'exposition au risque systématique sont tous positifs et importants.

(2) Ces résultats sont confirmés par l'analyse de la fonction de réponses impulsionnelles montrant la réaction du coût des capitaux propres MEDAFI à un écart-type dans l'une des variables de vulnérabilité aux chocs, pour chaque modèle estimé par pays.

(3) Pour chaque pays de notre échantillon, nos résultats montrent que l'augmentation de l'exposition aux chocs conduit à une augmentation temporaire du coût des fonds propres. Ces résultats suggèrent que l'intégration financière entraîne une augmentation du coût des capitaux propres dans les périodes troubles. Ce mécanisme fonctionne grâce à un ajustement du portefeuille : au cours de l'intégration financière, l'exposition aux risques systématiques passe d'un MEDAF domestique où le risque systématique est mesuré par la variance de l'indice local, à un MEDAF International où les investisseurs déterminent les rendements attendus en surveillant l'exposition de l'entreprise aux chocs internationaux sur le marché d'indices mondial. Etant donné que les betas des entreprises des marchés émergents sont généralement plus faibles, ce mécanisme conduit à une prime de risque plus faible. Toutefois, si les gains de la diversification sont compensés par une augmentation importante de la variance du marché international ou annulés par une augmentation soudaine des co-mouvements, cette causalité devient alors positive. En d'autres termes, l'adoption de modèles de prix internationaux par les investisseurs des marchés émergents peut conduire à une hausse du coût des fonds propres pour les entreprises cotées en période de tensions financières provoquées par l'extérieur.

(4) Du point de vue politique, ces résultats suggèrent que, même si l'intégration financière présente des avantages à long terme, elle est accompagnée par des coûts de déstabilisation en périodes de crises internationales. En outre, nos résultats montrent que la déstabilisation ne se limite pas au niveau macroéconomique mais affecte

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également le coût de capital microéconomique. Cela peut expliquer en partie la baisse observée dans l'investissement total dans la région à la suite de la crise mondiale (étant donné que le coût du capital affecte négativement la valeur actuelle nette des projets d'investissements).

(5) Le défi politique est donc de protéger les économies émergentes des flux de capitaux chauds et des chocs de liquidité mondiaux, tout en récoltant les avantages de l'intégration. Nous soutenons que la segmentation du marché des capitaux et les politiques de répression financières apporteraient des résultats indésirables. Améliorer la transparence financière et la résilience des marchés semble être une priorité.

Les implications politiques de l'étude sont les suivantes:

(6) Le développement du secteur financier de la région MENA doit être une priorité de l'agenda de réforme. Les marchés boursiers et obligataires sont parfois quasi absents et les entreprises ne peuvent pas lever des capitaux ni à l'intérieur ni à l'extérieur.

(7) L'augmentation de l'intégration financière au sein de la région MENA permettrait de réduire la vulnérabilité de ces marchés aux chocs internationaux et devrait apporter des avantages considérables pour les investisseurs de la région en rendant le capital plus mobile à travers les frontières et en abaissant le coût du capital. Par conséquent, un marché des capitaux plus liquide offrirait des coûts d'emprunts plus faibles pour le secteur des entreprises de la région MENA qui souhaite lever des fonds localement et permettrait de réduire son exposition aux afflux de capitaux spéculatifs de court terme.

(8) L'augmentation de la libéralisation financière au sein de la région MENA est également prévue de renforcer l'intermédiation régionale des ressources financières grâce à l'intégration étroite des marchés financiers et à l'accès accru des investisseurs de la région MENA aux marchés financiers régionaux pour financer les investissements. En outre, les investisseurs de la région MENA auront accès à une variété de taux de rendement ajustés aux risques pour améliorer l'efficacité de la répartition et la diversification du portefeuille, ce qui favorisera l'efficacité des marchés financiers de la région MENA. Une hausse de la libéralisation dans la région MENA devrait attirer des investissements de portefeuilles importants pour la région dans le but de diversification.

(9) Le renforcement des marchés locaux de capitaux de la région MENA, en particulier les marchés boursiers, est aussi une autre façon d'atténuer les effets de la crise financière mondiale, et aidera à réduire l'exposition des entreprises privées à des asymétries de monnaies dues aux emprunts étrangers. Ces entreprises pourront lever des fonds localement et réduire leur exposition aux chocs financiers extérieurs. Ils réduiront également toutes asymétries de monnaies (risque du taux de change) dans leurs bilans, et atténueront les répercussions de toutes sorties soudaines de capitaux émanant de la crise actuelle ou d'autres chocs financiers.

(10) Une façon de se protéger des mécanismes mis en évidence dans cette étude serait de mettre en place une réglementation de divulgation d'information plus stricte (des normes comptables, des exigences d'audit), afin d'empêcher les vagues d'élevages mimétiques irrationnels des investisseurs non informés. Des études antérieures ont

montré que les informations imparfaites aboutissent à un commerce mimétique. Ceci induit des augmentations significatives de la corrélation entre les indices de marchés nationaux et internationaux en périodes de crises, conduisant finalement à une augmentation du coût des fonds propres. Ces réformes de transparence doivent être faites dans le contexte d'un accroissement des échanges Sud-Sud et de l'intégration financière, ce qui aiderait à consolider les marchés et réduire la vulnérabilité de contagion. Parmi les exemples récents de ces politiques dans les pays émergents celui de l'intégration des marchés d'obligations en Asie du Sud Est, ou des réformes prudentielles continues en Corée du Sud, la Malaisie et l'Indonésie. L'intégration financière internationale devrait rester un objectif de politique de long terme. Cependant, les risques associés doivent être pleinement reconnus et abordés via des réformes nationales et une coopération internationale.

(11)   Afin d'améliorer l'intégration du marché financier, les responsables politiques de la région MENA ont besoin d'analyser la façon dont le coût des fonds propres au niveau des entreprises réagirait en période de crise financière internationale ou régionale. Cela permettrait une meilleure compréhension des avantages et des coûts de l'intégration du marché des actions.

Financial Integration and Shock Vulnerability: Implications for the Cost of Capital in MENA Emerging Markets

I. Introduction

The MENA region only attracted $20 billion in foreign portfolio investment between 1995 and 2004, less than Sub-Saharan Africa ($55 billion). For those capital-scarce economies in which performance is still mainly driven by factor accumulation, tapping in international financial markets is a must (Abu-Qarn and Abu-Bader, 2007; FEMISE, 2006). Very significant policy efforts were thus undertaken over the past decade to revert this trend. Financial liberalization policies have included plans to revitalize or establish stock markets in order to encourage international participation in listed companies (Ben Naceur *et al.*, 2008).

On a theoretical level, the international integration of domestic equity markets permits to enhance diversification opportunities for domestic and foreign investors, which in turn decreases risk premia, and ultimately the required rate of return for a given project (Stulz, 1999). Equity market integration is thus expected to reduce the cost of capital, increase investment and to enhance economic growth (Harvey 1995, Collins and Abrahamson, 2006). However, the virtuous mechanism uniting integration and firm financing depends on the assumption that the international correlation coefficient is lower than the domestic to international difference in stock market volatility. If this condition is not satisfied, increased exposure to foreign shocks offsets the diversification-induced portfolio stability gain for local investors shifting to an International Capital Asset Pricing (ICAPM) valuation model, and financial integration increases risk premia and the cost of capital. This exceptional case appears particularly relevant in times of global financial turmoil, where shift-contagion leads to a shift in market expectations and an observable structural break in the market linkages. Analysing how the firm-level cost of equity reacts in periods of internationally-induced stress would thus provide a better understanding of the benefits and costs of equity market integration. In addition, the discriminating role of foreign investors has not yet been investigated. Taking this into account, this study sheds new light on the impact of international financial integration on the cost of capital in emerging countries.

The bulk of the empirical literature on the consequences of contagion focused on the implications of a sudden stop in foreign capital flows. For instance, Adelman and Yeldan (2000) investigated the impact of the East Asian contagion cycle on economic output in the developing world within the framework of an inter-temporal computable general equilibrium model. Their experiments suggested that the affected area's fixed investment declined by 7.9 per cent while its GDP declined by 7.8 per cent upon contagion impact, while the long term effects of the crisis were also felt severely as a consequence of deceleration in the rate of capital accumulation. In a similar vein, Calvo and Mendoza (2000) attempted to measure the consequences of capital account liberalization in the context of informational inefficiencies and multiple equilibriums. They developed a theoretical model in which investors acquire country-specific expertise at a fixed cost and incur variable reputation costs, in a context where information asymmetries give rise to herding behaviour and sudden opinion reversals. They also implemented numerical simulations in the case of Mexico. According to their estimations, a rumour that reduced the expected return on Mexican equity from the equity market forecast (22.4 per cent) back to the level of the Organization for Economic Cooperation and Development (OECD) mean return (15.3 per cent) implied an outflow of

about $20 billion, or a reduction in the share of the world portfolio invested in Mexico of 40 per cent. The associated economic destabilization costs can be substantial in emerging countries which are often characterized by limited central bank foreign reserves. For instance, using a panel data set over 1975–1997 and covering 24 emerging-market economies, Hutchison and Noy (2006) found that the cumulative output loss of a sudden stop in capital flows amounts to around 13–15 per cent of GDP over a 3-year period.

To the best of our knowledge, there exist no empirical papers focusing on the issue of destabilization through the discount rate. Nonetheless, such a scenario seems to have theoretical grounds. In addition, a number of previous papers highlighted that contagion strongly undermines diversification strategies. For instance, Gerlach *et al.* (2006) analysed diversification benefits in four East Asian markets using weekly price returns from the 1993-2001 period. Their results showed the existence of significant linkages among these markets and highlighted that fund managers diversifying in East Asia should not ignore the impact of short-term turmoil on portfolio performance when examining the impact of globalization. These results point towards the well-known paradox that 'diversification works least when it is the most needed'. Diversification, risk premia and the cost of equity being closely related concepts; we may expect shocks and contagion episodes to significantly alter the cost of equity. Therefore, this study sheds light on an additional transmission mechanism of financial turmoil into domestic economies - an issue of particular relevance for emerging countries contending with the threats and opportunities of financial globalization such as the Middle East and North Africa's (MENA).We also shed light on the role of discriminating foreign investors. Although the topic remains largely un-investigated, in a recent paper focusing on Indonesia, Rhee and Wang (2009) showed that such investors rely on inside information and to adopt buy and hold strategies to extract abnormal returns in emerging markets. Our study should hence also contribute to this emerging branch of the literature.

The rest of the study is divided as follows. Section II presents a review of related literature. Section III is dedicated to an overview of the MENA stock exchanges we study. The theoretical motivation of the empirical time series models to be estimated is examined in Section IV. The empirical methodology and the empirical results obtained are presented in Section V. Finally, the last section offers some conclusions and policy recommendations.

II. Review of Related Literature

The finance literature has been concerned with the effects of financial integration and liberalization on the firm's cost of equity. The literature argues that financial integration and liberalization means that firms have unrestricted access to foreign sources of funding; *i.e.*, corporations can issue stocks or bonds on international financial markets. Due to the liberalized access to various sources of funding, firms will be able to raise capital at low costs. And if financial markets are not liberalized and a firm is forced to raise capital locally, then its cost of equity is likely to be higher than that of a company with unrestricted access to the international capital markets. Therefore, one would expect the restrictions to the local capital market to raise a firm's marginal cost of equity and therefore raise the rate of interest.

However and for financial liberalization to impact the cost of equity, commercial banks behaviour need to change post financial liberalization, otherwise there will be no significant improvement in the efficiency of the financial system, as measured by significant falls in

interest rates in general and the cost of equity in particular. While financial liberalization should generally lead to a lowering of interest rates and the cost of equity, whether they actually decline will depend on a number of factors. Generally, lending rates relative to deposit rates can increase or remain high depending on the level of reserve requirements, the competitiveness of the banking system, the cost structure of the market, the sophistication of the banking system, and also the macroeconomic environment. If there are limited channels for raising equity, such as limited or underdeveloped equity markets, banks will be in inclined to keep lending rates high. On the other hand, if the banking system is characterized by excess liquidity, deposit rates are unlikely to increase much following financial liberalization because the marginal cost of mobilizing resources is high, while the marginal profit may be non-significant or even negative. Indeed, banks may actively discourage deposits either by complete refusal of long-term deposits and/or having an inverted yield curve. Thus, the level of spreads may actually rise, rather than fall, after financial liberalization.

Although the main objectives of financial deregulation should be to increase the supply and improve the allocation of funds for investment, the consequence of financial liberalization on the supply of funds for investment is theoretically ambiguous. On the one hand, it is often thought that financial reforms improve the allocative efficiency of savings. However, financial liberalization has failed to meet these three expected efficiency gains in a number of countries, because accompanying a general rise in interest rates was a rise in the cost of equity for a substantial class of borrowers. Also, the elimination of subsidized credit programs, another common feature of financial reform, could increase the financing constraints of those firms that previously benefited from the directed credit system. Accordingly, financial liberalization changes the composition and allocation of savings, but will not necessarily relax financial constraints for all classes of firms.

From a different angle and using a multifactor asset pricing model to capture the co-movements between asset returns in emerging markets and weekly data on currency stocks and bonds for the period 1997 to 2001, De Los Rios (2007) tried to test whether the exchange rate regime, whether fixed, floating or a pegged regime, reduces the cost of capital and whether there are gains from the globalization process, and whether co-movement between asset returns are beyond what can be explained from common or fundamental shocks. He argues that when the investor sees a crisis luring in the horizon, the price of bonds is likely to fall. Moreover, as world bond returns increases, emerging market returns increase as well. However, a local currency appreciation is associated with lower stock returns. Periods of high world and local bond returns seem to be linked with period of high stock returns. Furthermore, it is confirmed that common global shocks affect emerging stock returns. He shows that financial crises do affect countries following a floating exchange rate regime unlike the ones following a fixed one. The effect of financial turbulences is magnified for countries following a fixed exchange rate regime as compared to countries following a floating one. The reduction in the exchange rate volatility has been achieved at the expense of an increase in the local interest rate volatility. He found that interest rate fluctuations do affect bonds and not stock prices; moreover, investors dislike investments denominated in a currency that is subject to large fluctuations. He concluded that investors charge a premium to the investment denominated in a currency with a fixed exchange rate which is not credible.

Caporale *et al.* (2009) focus on the effects of international financial integration on the determinants of long run real exchange rate in emerging countries using a sample of 39 developing countries covering the period 1979-2004. Unit root and cointegration panel test

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results confirm the existence of a long run relationship between financial integration and the long run real exchange rate. In fact, international integration plays an important role in devaluation and undervaluation of the long run real exchange rate. A 1 per cent increase in financial integration causes a 0.13 per cent depreciation in the long run real exchange rate value for all countries at the same time. Persistent misalignments are also found to be frequent in emerging countries resulting in an undervaluation in the MENA countries and an overvaluation in Latin America. The authors suggest adopting a flexible exchange rate system in these 2 groups of countries in order to reduce these misalignments in the long run equilibrium real exchange rate.

Using a multi-country model, Martin (2010) compares the effects of financial integration, both on a regional and global level on asset returns, risk diversification, and on the size of financial markets which is assumed to be an important determinant of the cost of equity and asset return. It is shown that larger and richer countries have a financial home bias that leads to higher asset prices. The impact of the European Union (EU) Monetary unification was also tested (a fall in transaction costs between the EU countries). The results show that the introduction of the euro had an important effect on cross border trade in assets; this fall in transaction costs is around 17 per cent for equities and 14 per cent for bonds. It was also argued that the introduction of the euro increased regional and global financial integration. Moreover, the fall in transaction costs increased cross-border trade in assets as well as the demand for the assets in the integrated euro zone. Finally, the relation between financial integration and financial crises was studied in a theoretical framework and the author concludes that trade integration reduces the impact of a financial crisis that may be result from financial integration. In other words, trade integration works as a stabilizing financial mechanism. Thus, financial integration together with regional trade integration is favoured to lower or even eliminate the effects of financial crashes.

Ben Naceur and Labidi (2009) argued that the growth performance of the MENA region in the last 5 years has showed the importance of intraregional integration as a mean of sharing prosperity within the region, and as a catalyst for global integration and competitiveness. Given the existing complementarities between MENA countries, there are many possibilities for intra-regional integration. Financial integration within the region will help deepen financial markets, and increase their efficiency. Intra-regional foreign direct investments and portfolio investments have risen in many MENA countries. As for capital market integration, the amount of funds that flows intra-regionally depends on regulatory aspects related to stock markets and foreign investments. However, most countries impose barriers and restrictions on foreign investments in domestic equities, preventing a deeper capital market integration (for example, Amman Stock Exchange imposes a ceiling of 50 per cent foreign ownership for companies operating in some specific sectors, foreign investors are allowed to own a maximum of 49 per cent of the United Arab Emirates (UAE) corporations, and foreign ownership in Omani companies is generally limited to 70 per cent). More pronounced intra-regional integration should enable investors throughout the region to achieve more portfolio diversification, and improve resources allocation.

Mendoza *et al.*, (2009) assume that financial heterogeneity among countries exists only from the development of domestic financial markets. They compare stationary equilibria under different scenarios: financial autarky and perfect capital mobility. They conclude that international financial integration between countries with financial heterogeneity explains the

large imbalances that exist in the United Stated, as well as in other industrial and emerging countries.

On the other hand, there exists a very substantial literature on spillovers and contagion effects that especially flourished after the Asian Crisis. For instance, Gonzalez-Hermosillo and Hesse (2008) analyse liquidity spillovers across asset markets. The identification of channels of shock transmission across countries is discussed in Dungey *et al.* (2005). Beirne *et al.* (2008) examine volatility spillovers from mature to Emerging Markets countries and test for their changes during crisis periods. Similarly, other studies that jointly investigate spillovers of Emerging Markets and mature countries are Calvo *et al.* (2008) and Kaminsky and Reinhart (2003).

It is important to note that the finance literature distinguishes between fundamental contagion and shift contagion. Fundamental contagion occurs as a result of greater economic and financial integration and disseminates through bilateral and multilateral trade agreements and stock market integration – independently of the occurrence of a financial crisis – leading to simultaneous negative co-movements in economic fundamentals. These shocks can be real or financial, and include among others, a fall in major stock markets indices, an increase in world interest rates, a decrease in international demand and capital flows, or sudden variations in the exchange rates of major currencies. By contrast, shift-contagion refers to the change in international and domestic investors' behaviour and sentiments resulting from a shift in market expectations after controlling for the effects of fundamentals. The shift in market expectations resulting from herding behaviour leads to an observable structural break in the market linkages. Underlying mechanisms include financial cognitive dissonance, endogenous liquidity shocks, perception of political risk (Forbes and Rigobon, 2000), portfolio rebalancing (Kodres and Pritsker, 2002), and informational cascades (Calvo and Mendoza, 2000). Those complex factors which may occur simultaneously may affect categories of investors differently and are ultimately contingent on the crisis scenario.

Moreover, a significant strand of the literature has been recently concerned with the spillover effects of the recent global financial crisis on developed and emerging countries. It was argued that the effects of the crisis on emerging financial markets varied according to their degree of financial integration with the more mature financial markets. Moreover, the relationship between a financial asset's risk as proxied by its variance and its return is not only important for pricing financial assets, but also for quantifying the risk of contagion between financial markets. Therefore, the theoretical asset pricing models (e.g., Merton, 1973, 1980; Sharpe, 1964) link the return of an asset to its variance.

Frank *et al.* (2008) study important issues related to the recent period of financial turmoil and turbulence in the second half of 2007. In particular, the liquidity shocks transmission across financial markets and national boundaries, the strength of links across markets and across borders, the difference in the international spill overs between advanced economies and emerging markets, volatility risks in global financial markets, market and funding liquidity and the issue of bank insolvency. A parsimonious multivariate GARCH model is estimated to shed light on the transmission of the recent liquidity shocks. The results suggest that the interaction between market and funding liquidity sharply increases in the U.S., and that bank solvency issues become important. Regarding the liquidity spillovers that occurred across financial markets in emerging and advanced economies during and in the aftermath of the 2007 United States (US) subprime mortgage crisis, it was found that the main spillovers are

identified to occur through different modalities for advanced economies with more sophisticated financial systems, than for emerging markets. In contrast, the spillovers to the key emerging markets examined (Brazil, Mexico, Russia and Turkey) are largely through market liquidity pressures, as global investors ran to place their assets in the most liquid government securities. Emerging markets were not spared by the increased volatility experienced by advanced financial markets.

Lagoarde-Segot and Lucey (2009) investigate the effects of the Asian crisis, the Russian financial turmoil, the Turkish crisis, the Argentinean insolvency crisis, the 9/11 terrorist attack and the American financial turmoil that followed the Enron and WorldCom accounting scandals on seven emerging MENA countries from September 1997 to September 2002. Using a fixed effect panel data, they tested whether the MENA markets are subject to joint vulnerability to common exogenous shocks. They investigated financial vulnerability at a country level using a country vulnerability index based on a battery of bi-variates tests for shift-contagion. Empirical results from the fixed-effect panel regression suggest that the world index is significant in explaining co-movements between the MENA markets. However, the emerging market index is insignificant, implying a weak share of the MENA markets in emerging markets total capitalization; and the fact that most economic interaction of these countries takes place with developed countries rather than with each other. The analysis of joint contagious shocks showed the absence of joint contagion over the period of study, suggesting that the MENA financial markets are not sensitive to regional re-allocation of international portfolios in the event of an international financial crisis. The bi-variates analyses suggested contagion for every single MENA market in at least one out of the seven crises episodes. The most significant evidences in favour of contagion are found in the case of Israel during the Turkish crisis, Jordan during the 9/11 attach, Tunisia during the Brazilian crisis, and Turkey during the Enron crisis. Israel and Turkey are the only two markets that can be suspected to have endured contagion during the Asian crisis. Evidence of contagion in the MENA seems to increase over time: they yielded two relationships during the 1997 Asian crisis, four during the 2001 Turkish crisis, and their results culminate with five relationships during the 2002 Enron crisis. They found that Turkey is the sample's most vulnerable market, followed by Israel and Jordan and then Tunisia, Morocco, Lebanon and Egypt.

Neaime (2012) studies the global and regional financial linkages between MENA stock markets and the more mature markets of the US and EU, and on the intra-regional financial linkages between the oil and non-oil producing MENA countries' financial markets. He focuses on the dynamic relationships in the volatilities of the returns in MENA stock markets. It is shown that the spillover effects of the recent global financial crisis on MENA countries and its effects on their stock markets varied according to their degree of financial integration with the more mature financial markets. Given their strong linkages with global stock markets, the stock markets of Egypt, Jordan, Kuwait, Morocco, and the UAE were the most affected by the global financial crisis, with insignificant impacts on Saudi Arabia.

Balakrishnan *et al.* (2009) construct a new financial stress index for emerging economies to help study how financial stress spreads from advanced to emerging countries. Their paper shows that prior financial crises in advanced economies have passed through to emerging economies rapidly, with financial linkages a key channel of transmission. Econometric analysis shows how country specific factors in addition to common factors help in the transmission of financial stress from advanced to emerging economies. Financial integration between advanced and emerging economies seems to be a key channel of transmission. In

fact, emerging economies that have higher level of debts relative to advanced economies tend to be more affected by the financial crisis affecting those economies than those emerging countries that are less financially linked to these economies. Emerging countries can thus protect themselves from financial stress affecting advanced economies by lowering their current account and fiscal deficits. However, case study evidence of past banking sector financial stress in advanced economies shows that the decline in capital flows can be large and lengthy. The decline in capital flows to emerging economies following a crisis may be extended, given the solvency problems facing advanced economy banks that provide significant financing to emerging economies. A matched policy response by advanced and emerging economies is thus the solution, since reducing individual country vulnerabilities alone cannot protect emerging economies from a major financial distress in advanced economies.

Beirne *et al.* (2008) study the volatility spillovers (causality in variance) from already mature and established stock markets to a sample of 41 rising and emerging stock markets. They also analyse the changes in the transmission instrument (contagion) during times of turbulences in mature markets and the presence of spillovers to emerging markets. The empirical results show that indeed spillovers from mature markets influence the dynamics of the variances of returns for the tested local and regional emerging stock markets, and that spillover parameters do change during times of turbulence in mature markets. In fact, in some emerging market economies, spillovers from mature markets are only present during times of turbulence. From comparing conditional variances in local emerging stock markets during times of turbulence and during other times of non-turbulence, the authors were able to conclude that in most emerging market economies, local market volatility tends to be higher during turbulence times in mature markets, although this rise in volatility is not always significant.

Calvo *et al.* (2008) study the role of foreign-exchange denominated debts and financial integration into world capital markets using a sample of 110 developed and developing countries during financial crises that took place in between 1990-2004. The authors focus on sudden stop episodes in which a given economy exhibits a large and largely unexpected cut in capital inflows. In addition, the authors assume that foreign-currency denominated debts play a central role in this respect, especially when the sudden stop brings about a sharp increase in the real exchange rate. This is so because central banks have serious limitations as lenders of last resort in terms of foreign exchange. In addition, and since financial crises are in many cases associated with major real currency depreciation, it is thus necessary to bring into focus factors that could provoke large increases in the real exchange rate. Their paper find that (1) systemic sudden stops tend to come hand in hand with large real exchange rate fluctuations, a key ingredient for balance-sheet effects; and (2) sudden stops seem to come in bunches, grouping together countries that are different in many respects, such as fiscal stance, monetary and exchange rate arrangements. This particular type of bunching suggests that when analysing Sudden Stops, careful consideration should be given to financial vulnerabilities to external shocks.

Kaminsky and Reinhardt (2003) examine which markets are most coordinated internationally and exhibit the greater extent of co-movement. They argue that when a country suffers from a deep financial crisis, all markets are affected; the currency weakens, domestic interest rates rise as expectations are unsettled, the terms of borrowing in international capital markets deteriorates, and other asset prices such as equity and real estate decrease. Volatility increases across the board. The results suggest that even countries with little capital account restrictions

may be subject to other forms of capital market segmentation. Hence, the differences in the degree of capital mobility are something that not only needs to be understood across countries, but across markets in a particular country as well.

Cardarelli *et al.* (2009) address the following questions: Why are some periods of financial stress associated with slowdowns, or even recessions, while others appear to have little impact on the real economy? Has financial innovation reduced the role of banks in propagating shocks from the financial system to the real economy? To answer these questions, their paper looks at past episodes of financial stress and their implications for subsequent economic activity. It constructs an index of financial stress in banking, securities, and foreign exchange markets in 17 advanced economies over the past 30 years, identifying 113 episodes of financial stress. Looking at these episodes reveals that not all episodes of financial stress lead to economic slowdowns or recessions. Of the 113 financial stress episodes identified, 29 were followed by slowdowns and 29 by recessions. The remaining 55 episodes were not followed by an economic downturn. Other findings suggest that episodes of financial turmoil characterized by banking sector distress are more often associated with severe and protracted downturns than episodes of stress centered mainly in securities or foreign exchange markets.

Forbes and Chinn (2004) explore why do sudden swings in the market of the world's largest economies appear to spread to some smaller markets but leave others unaffected? Their paper examine the importance of cross-country linkages with large financial markets in explaining financial market returns in countries around the world, as compared to global and sectoral factors and the importance of bilateral trade flows, bank lending, and investment exposure in explaining these cross-country linkages. They find that movements in the United States stock markets have a particularly important impact in the Americas, for instance, and markets in Germany, France, and the United Kingdom are especially influential in Europe. Market relationships also follow traditional colonial patterns; for example, the performance of British markets is a large factor for nations such as Australia, Canada, and Hong Kong. Among the cross-country factors, they find that bilateral trade flows, as measured by a country's reliance on exports to the largest economies, are the most important. One surprising finding is that, after controlling for other linkages, foreign investment flows from large economies do not appear to significantly influence stock market returns in smaller markets. Finally, the authors conduct a similar exercise for bond markets although, because of data limitations, they limit the scope of the study to the 1994-2000 period. Once again, sectoral and cross-country factors remain significant and more important than global factors in determining market returns. Finally the paper reaffirms that despite the recent growth in capital flows across countries, direct trade linkages are still more important than financial linkages in determining how shocks to the world's largest economies affect a variety of markets around the globe.

Papademos (2010) highlights the fact that the latest US financial crisis has revealed a rather complex set of interdependencies between financial stability, integration and development, where the stability of the financial system does contribute to its development and integration. In the opposite direction, a more integrated and innovative financial sector typically enhances financial stability. However, the crisis demonstrated that a highly integrated and developed financial system does not always and necessarily strengthen financial stability. Under certain conditions, financial integration and certain forms of financial innovation can contribute to the build-up of vulnerabilities and the emergence of systemic risks.

With the above in mind, this study adds to the exiting finance literature by first providing new insights on the micro-economic implications of international financial integration on the firm's cost of capital in the MENA stock markets of Egypt, Jordan, Morocco and Tunisia. For this purpose the study develops a number of annual proxies for the firm-level cost of equity in a panel of four emerging markets, using different methodologies. Then it explores the implications of the recent global financial crises on the MENA region by computing a battery of annual financial integration indicators capturing long run linkages, the dynamics of country exposure to international shocks (differentiating between fundamental and shift contagion), and ownership structure (differentiating across investors category and strategy).

III. MENA Stock Markets: An Overview

Compared to other emerging market economies, MENA's attractiveness to international investors has been quite modest before the financial crisis, even in the better performing countries of Morocco, Tunisia, Jordan and Egypt. Those MENA countries have recently liberalised more than others investment regulation, removed ownership restrictions as well as trade and capital flows barriers. The availability of adequate and well organised institutions can reduce investment transaction costs, turning projects more profitable. Capital flows are also affected by the effectiveness of the legal system and the enforcement of property rights.

Private capital and portfolio flows to the region have been also relatively limited. While cross border capital flows between the oil producing MENA countries' financial markets increased significantly in recent years, they remained negligible with the non-oil producing MENA countries. Intra-regional and international portfolio investments have been made mainly in those MENA economies that have implemented policies conducive to strengthening the operational framework of the domestic financial market, namely Morocco, Tunisia, Egypt and Jordan. It should also be noted that MENA's capital markets have traditionally been less important in channelling capital flows. A fairly developed commercial banking system has taken the lead in attracting and distributing capital, and in stimulating portfolio investments in the MENA region.

With the possible exception of Egypt, Jordan, Tunisia and Morocco, MENA countries' equity markets have only come to the fore in the 1990s. Despite their small market capitalization, during the past ten years, MENA countries' equity markets have exhibited performance characteristics parallel to other emerging markets in similar stages of development. Record market capitalization growth rates can be noted in Morocco and Jordan, and to a lesser extent in Egypt and Tunisia over the 1998-2011 period (see Table 1). This is due to massive privatization plans introduced in those countries, and to the extensive sale of government assets to private firms, and to the considerable efforts devoted recently in enhancing the efficiency, depth, integration, and liquidity of the four stock markets. However both Egypt and Jordan's stock market capitalizations have declined significantly in between 2007-2009 as a result of the global financial crisis, from $134.9 and $41.3 billion in 2007, to $86.32 and $31.9 billion respectively in 2009. In addition, it should be noted that the recent open access to foreign investors to almost all MENA' stock markets has contributed significantly to the growth performances of the MDEs' stock market capitalization.

As shown in Table 1, the MENA countries are endowed with functional and internationally open equity markets. Settlement cycles, trading systems and market regulation have converged during recent years. In addition, all countries have ratified the International Accounting and Auditing Standards, although the report frequency varies from one country to another. In spite of a common trend towards modernization, the MENA markets still have distinctive institutional features.

Table 1 : MENA Stock Market Developments: 1998-2011

	Date of Operation	Number of Listed Companies		Stock Market Capitalization (Billion $)		Stock Market Cap/GDP (in %)		Value Traded (Billions$)		Turnover Ratio (%)	
Egypt	1950	**1998**	**2011**	**1998**	**2011**	**1998**	**2011**	**1998**	**2011**	**1998**	**2011**
		861	231	24.38	48.68	28.7	21.2	8.14	22.03	22.2	33.5
Tunisia	1969	**1998**	**2011**	**1998**	**2011**	**1998**	**2011**	**1998**	**2011**	**1998**	**2011**
		38	57	2.27	9.67	10.4	21.1	0.52	1.1	8.2	11.0
Morocco	1929	**1998**	**2011**	**1998**	**2011**	**1998**	**2011**	**1998**	**2011**	**1998**	**2011**
		53	75	15.68	60.09	39.2	60.00	2.52	6.31	10.0	9.8
Jordan	1978	**1998**	**2011**	**1998**	**2011**	**1998**	**2011**	**1998**	**2011**	**1998**	**2011**
		150	247	5.84	27.18	73.8	94.3	1.1	4.02	11.6	13.9

Source: World Bank's World Development Indicators Database and the Arab Monetary Fund

III.1. Jordan

The Amman Stock Exchange (ASE) was revitalized in 1997, when a new Securities Law was approved to improve the structure of the stock market, while capital account transactions in capital markets securities and money market instruments were also liberalized. The ASE is now one of the most developed and sophisticated markets in the MENA region, with a market capitalization to GDP ratio of 94.3 per cent in 2011 (See Table 1) and foreign residents owning about 50 per cent of shareholding companies. Broker's commissions depend on the market value of the underlying securities. A new trading system was introduced in March 2009, entailing comprehensive changes to all electronic infrastructures. This project was funded by the European Union and seeks to ensure higher speed, efficiency and transparency in stock market transactions. Finally, the exchange is an affiliate member of the International Organization for Securities Commissions (IOSCO). However, banks and financial services make up almost 50 per cent of market capitalization, while Jordan's banking system is also highly concentrated, with the three largest banks accounting for 90 per cent of total assets. The Jordan Securities' Commission, aiming at regulating and supervising the disclosure of information is directly attached to the Prime Minister. Interestingly, an 'off the floor' segment of the secondary market is dedicated to inheritance and inter-family transactions.

The ASE is one of the more open stock markets in the MENA region. The exchange currently has 836,326 shareholders, 44.8 per cent of the shares are held by Jordanian corporate and individual investors, foreign investors account for 49.1 per cent of share ownership, and the government through the Jordan Investment Corporation holds 6.1 per cent. In 2011, the number of listed companies was 247 composed mostly of insurance companies, and banks.

According to Table 1, the market capitalization, in Jordan, has augmented persistently in between 1998 and 2011 increasing from $ 5.84 billion to $ 27.18 billion, which is an increase of 365 per cent, reaching an all-time high in 2008. We notice that the value traded is constantly increasing over time reaching a value of 4.02 billion which is a good indicator of the financial growth and development in Jordan. Table 1 also indicates that the turnover ratio in Jordan is also increasing over time. In between 1998 to 2011 it increased from 11.6 to13.9 percent.

III.2. Egypt

The Egyptian Stock Exchange (ESE) comprises two exchanges, the Alexandria Stock Exchange (officially established in 1888), and Cairo Stock Exchange (established in 1903) and was ranked fifth in the world in the 1940s prior to nationalisation policies. The re-activation of the ESE started in the 1990s within the broader context of deregulation policies. The 1992 Capital Market Law defined the regulatory framework for financial intermediaries and established the Capital Market Authority as an independent regulatory agency for the securities industry, while also strengthening investor rights and financial disclosure requirements. There is no taxation on dividends or capital gains for individual and legal entities. Market development and the privatisation process have gained significant momentum since 2004 with the Cabinet restructuring and change of Central Bank management. Over the last years, memorandums of understandings were signed with the stock exchanges of Italy, Cyprus, Korea and Shanghai, while a subset of Egyptian stocks is cross listed in Abu Dhabi since 2006. On June 12, 2008, the first mid and small cap market of the MENA region was launched in an effort to promote the financing of innovation.

The number of companies listed in Egypt was 656 in 1992 according to the Capital Market Authority; while the number of companies which were actually traded was 239. However, in 2008, there were only 373 listed companies on the Cairo and Alexandria Stock Exchanges, with 322 traded. The highest number of listed companies was in 1992, but most of these companies were not traded. In 1998, listed companies decreased but traded ones rose, due to liberalization and reforms of the stock market. In 2011, this number drops sharply because of the delisting of companies that did not meet the new requirements of the reformed Stock Exchange or had very little turnover. Also, during this period we had a significant number of mergers and acquisitions which contributed to the decline in the number of companies. In fact, the Capital Market Authority's Board of Directors approved new listing rules for the Egyptian Stock Exchange, which came into effect in 2002. Any company that wishes to be listed has to be thoroughly investigated by the EGX listing department and approved by the Listing Committee of EGX.

The market capitalization in 1992 was $3.28 billion. In 1998, with the second round of reforms, it moved to a considerable $24.38 billion, after which it grew to $48.68 billion in 2011 (see Table 1). These figures indicate a significant growth in market capitalization. The fast rise in market capitalization since 2000 was mainly due to a massive growth in investor confidence, the acceleration of the privatization program and the initiation of many high-profile initial public offerings. Also, the participation of foreign investors in the stock market improved substantially, especially with the designation of EGX by the US Securities and Exchange Commission (SEC) as a "Designated Offshore Securities Market" in April 2003, and the launching of the EGX 30 Price Index, a new free floated market capitalization index. The increase in market capitalization indicates the entrance of larger firms into the market, especially with the privatization and floatation of several state-owned companies like AMOC, Sidi-Krir and Telecom Egypt. One last thing worth noting is that there was a plunge in market capitalization, from $139.9 billion in 2007, to $85.9 billion in 2008, and this can be attributed to the effects of the global financial crisis which had its toll on the Egyptian stock market in 2008. Table 1 also points to a decline in the market capitalization to GDP ratio from 28.7 to 21.2 per cent. This was mainly due to the recent political turmoil and related social and political unrests. However the value traded has increased from $8.1 billion to $22 billion. This significant growth in the value traded reflects the massive development of the activity of the Egyptian stock market, which is also reflected by the high turnover ratio in 2008 that reached 33.5 per cent in 2011. Even with the delisting of a number of companies, the number of shares, bonds and contracts in the stock market grew considerably since 1998, with drastic reforms, modernization, liberalization and openness.

III.3. Morocco

The Casablanca Stock Exchange (CSE) is the third oldest stock exchange in Africa and was established in 1929. The exchange experienced continuous legal modernization since 1993. It has an electronic trading system and comprises a centralized order-driven market and an over the counter block-trade market. There are no restrictions on foreign investment on the Casablanca Stock Exchange, nor on foreign ownership of companies. A 10 per cent tax on dividends applies, and the tax on capital gains is zero percent for legal entities and 15 per cent for individual investors. In addition, shareholders breaching the 5, 10, 20, 33.33, 50 or 66.66 per cent thresholds of ownership of a listed company must notify the company, the Council for the Code of Ethics in Securities Markets and the Casablanca Stock Exchange and specify their intentions. The *Association Professionnelle des Sociétés de Bourse* formulates the rules and procedures for trading and the *Conseil Déontologique des Valeurs Mobilières* (CDVM) performs a monitoring function. It also manages a guarantee fund aimed at compensating customers of brokerage firms in liquidation.

The CSE is a relatively small but dynamic stock exchange in Africa. Founded in 1929, it has currently 16 brokerage firms and 75 listed securities. It is the second biggest bourse after Johannesburg's stock exchange. Reforms regarding the exchange have been introduced in 1993, transforming it into a modern and well developed stock exchange. From 1998 to 2011, the number of companies listed on the market increased from 53 to 75 which is a considerable increase relative to the period under consideration, and relative to the changes and reforms that have been introduced in the stock market. Moreover, the Moroccan financial market has witnessed a considerable evolution during the last few years, mainly due to privatization. The market capitalization has increased from $ 15.68 billion to $ 90.09 billion within a 14 years

period (Table 1). The evolution of the real estate stock market index has dramatically increased over the last couple of years, reflecting the high performance of real estate companies, and investors' strong demand for their shares, representing 16 per cent of the total stock market capitalization at the end of 2007. Moreover, the corporate sector's performance has considerably improved. Table 1 indicates that the both value traded and the turnover ratios remained stable with 10 per cent in 1998 and 9.8 per cent for the latter in 2011. This slight improvement of these indicators was even more consolidated since privatization was made through the stock market. Under the law adopted in 1993, the Casablanca stock market status changed from a public institution to a private one whose capital is equally shared by the stock market firms. In parallel, the creation of the Deontologic Council of Stocks and Bonds, helped in the smooth running of the market and ensured the protection of savers.

III.4. Tunisia

In 1969, Tunis Stock Exchange was inaugurated; and currently more than 57 companies are listed on this exchange. Even though this exchange was initially formed in 1969, it became in 1995 an integral component of the Tunisian financial market. In 1998, 38 companies were listed on the Tunisian stock exchange compared to 57 companies listed in 2011. The number of companies listed has been increasing over the above essentially due to the increase in accessibility to foreign investors, the technical developments in the capital market sector, improved tourism, gains in trade with the EU and a strong banking sector.

The Tunis Stock Exchange has been significantly revitalized over the last decade. It is a centralized, order-driven market composed of a formal market and an alternative market where unlisted shares are traded over the counter. Stocks are exchanged using fixing and continuous trading given their level of liquidity. Trade is conducted within a daily 6.09 per cent price fluctuation margin. Commissions do not exceed 1 percent of the value of transactions. There is neither dividend nor capital gains tax. In addition, companies and individuals investing in priority zones, the export sector or information technologies benefit from a 35 to 100 per cent tax cut. However, foreigners willing to buy more than 10 per cent of a company listed on the Tunis Stock Exchange (and 30 per cent of an unlisted company) need central bank approval. Similar ownership declaration thresholds as those applying to the Moroccan stock exchange hold. Trade is only conducted by accredited brokers, and a mutual guarantee fund hedges transaction against broker payment default. Financial companies such as Banque de l'Habitat, Amen Bank and Biat dominate the index. An open outcry market is maintained on Fridays at 10AM.

Market capitalization in 2011 has increased significantly over the year 1998 from $2.27 billion to $ 9.67 billion (Table 1). The value traded has increased exponentially from around $ 0.52 billion in 1998 to $ 1.1 billion in 2011. These significant increases are indicators of the growing openness and accessibility of the market to foreign investors. Following the growth of the economy, the total market capitalization of Tunisia's stock exchange also grew. It is obvious that the market capitalization has witnessed a significant increase that has started in 2000 due to the arrival of new multinational companies. The influx of companies that followed due to the liberalization of the legal constraints imposed on foreign companies wanting to have a quotation on the Tunisian stock exchange has also raised the volume traded to unprecedented heights. The traded volume has effectively increased by 30 folds thus increasing the liquidity of the stock market and attracting other big sized institutions. The

huge uplift in these numbers has been due to a larger foreign participation. Now, it is estimated that foreign investors account for about 75 per cent of the total active investors on the TSE. The Turnover ratio has also increased from 8.2 per cent in 1998 to 11 per cent in 2011, which implies that not only the stock market is increasing in size but it is also improving in terms of liquidity and efficiency.

IV. Theoretical Framework

Equity market integration means that the domestic equity market becomes a part of the global equity market. Under full market integration, domestic assets are rewarded according to their covariance with the world portfolio, as the risk premium on any asset is proportional to its world beta. In other words, risk is measured through asset contribution to the world portfolio. The international version of the CAPM was proposed by Solnik (1974). For any local firm, we have:

$$
\begin{cases}
E(R_{i*}) = r_{f*} + \beta_{iw}\left[E(R_w) - r_{f*}\right] \\
\left[E(R_w) - r_{f*}\right] = \gamma(W)\sigma^2 w \\
E(R_{i*}) = r_{f*} + \gamma(W)COV(R_{i*}, R_w)
\end{cases}
\tag{1}
$$

Where β_{iw} denotes firm i's beta with the world market, $E(R_w)$ denotes the required rate of return on the world equity market portfolio, $\sigma^2 w$ denotes the variance of the return of the world portfolio and r_{f*} is the world risk-free rate. In other words, expected local returns $E(R_i)$ in a fully integrated market depend solely on non-diversifiable international factors. One important consequence of equity market integration levels is that it determines access to finance for a firm listed in an emerging market's stock exchange. In the long run, market integration expands diversification opportunities for domestic investors and hence negatively affects expected returns and the cost of capital (Stulz, 1999, Chari and Henri, 2004). This phenomenon has been widely documented in empirical studies. For instance, using a panel of 10 emerging markets, Henry (2000) found that stock market indices experience abnormal returns of 4.7 per cent per month during an eight-month window leading up to the implementation of liberalization and significantly decreased afterwards. Patro and Wald (2005) also documented a long run decrease in the cost of capital. Their analysis highlighted an average change of −2.89 per cent in emerging markets monthly returns three years after liberalization. Using a different measure for the cost of capital (dividend yields), Edison and Warnock (2003) also showed that the decrease in the cost of capital was sharper in countries that completed their liberalization program. Their estimates suggested that a full liberalization was associated with a 104 basis point decrease in dividend yields whereas an incomplete liberalization resulted in an increase in dividend yields. This echoes Bekaert and Harvey (2000) who found a 5-75 basis point decrease and Kim and Singal (2000), who observed a 76 basis point decline in the period following liberalization. Most of these empirical studies, however, focused on the immediate aftermath of liberalization and did not control for sudden changes in international financing conditions and the behaviour of foreign investors.

We may indeed expect equity market integration to concomitantly cause a higher domestic sensitivity to international shocks. The linkage between market integration and shock vulnerability has been formally described by Bekaert *et al.* (2005). Their approach was to

extend the traditional CAPM from a one-factor to a two-factor setting. To do so, they divided the world market into the United States (*US*) and a particular region (*reg*), and allowed for local factors to be priced. Letting i and j be two individual countries, and assuming that the idiosyncratic shocks to the US, regional and individual markets are non-correlated, these authors have derived the following dynamic relation between covariances h, betas β and variances σ:

$$\begin{cases} h(i,us,t) = \beta_{i,US,t-1} \times \sigma^2_{US,t} \\ h(i,reg,t) = \left(\beta_{i,reg,t-1} \times \beta_{US,reg,t-1} \times \sigma^2_{US,t} \right) + \left(\beta_{i,reg,t-1} \times \sigma^2_{reg,t} \right) \\ h(i,j,t) = \left(\beta_{i,US,t-1} \times \beta_{j,US,t-1} \times \sigma^2_{US,t} \right) + \left(\beta_{i,reg,t-1} \times \beta_{j,reg,t-1} \times \sigma^2_{reg,t} \right) \end{cases} \qquad (2)$$

Equation (2) has three important implications. *First*, it shows that a market's covariance with the US (regional) market return is positively related to its country-specific beta with the US (or region). *Second*, provided that the country specific beta parameter is positive, it highlights that higher volatility in the US market induces higher return covariance between the US and market i. *Third*, we can see that the covariance with the regional market or any other national market j within the same region increases in times of high return volatility in the US and/or the regional market. The direct implication of these relationships is the appearance of 'contagious bear markets' in times of financial turmoil.

Taking this into account, one may wonder whether current expectations on the dynamics of the cost of capital after liberalization hold in periods of internationally-induced financial stress. More particularly, there is a case for financial contagion to destabilize the expected negative relationship between international integration and the cost of capital. If proven, this mechanism could constitute a potential drawback against liberalizing without appropriate safeguards. This topic is important from an academic point of view, as it may help to better identify the micro-economic transmission mechanisms of international financial shocks to the real sector. However, to the best of our knowledge, this issue has never been investigated in existing empirical work.

The behaviour and real impact of foreign institutional investors constitute another important puzzle. There is no consensus among researchers regarding literature on the impact of institutional investment. Some work thus highlights the added benefit of the intermediation of institutional investors in terms of higher trading volumes (Allen and Santomero, 2001) or again in solving the problem of minority shareholders' free-riding both in terms of producing information for the market (Kini and Mian, 1995) and of controlling management (Diamond, 1984). Conversely, other research stresses the cost of institutional investment. Institutional investors who tend to hold blocks of shares supposedly reduce trading frequency (Rubin, 2007) and put pressure on prices when buying or selling those blocks of shares (Sias *et al.*, 2006). They also supposedly force market participants to incur an adverse selection cost by trading on the basis of privileged information (Glosten and Milgrom, 1985). From a policy-making perspective, determining the impact of institutional investment is fundamental: companies' cost of capital could be affected by the type of institutional investor as well as the nature of their investment strategies. For companies, given investors will shift transaction costs to company stock price, institutional investors could raise or decrease their cost of capital, depending on their identity and trading characteristics. To our knowledge, no study has been carried out on emerging markets: the contribution made by institutional investors in terms of trading volumes could offset the adverse selection costs and favour

institutional investment in such markets. This study will hence provide new insight on the micro-economic implications of international financial integration. To tackle this issue, we follow a three step procedure: In the first step, we develop a number of annual proxies for the firm-level cost of equity in a panel of emerging markets, using different methodologies. In the second step, we compute annual financial integration indicators capturing long run linkages, the dynamics of country exposure to international shocks (differentiating between fundamental and shift contagion), and ownership structure (differentiating across investors category and strategy).Finally, we analyse the impact of international integration on the microeconomic cost of capital using a set of dynamic panel models with appropriate control variables and robustness checks. Our results provide new information on the impact of international financial integration on the real sector. In the process, we will also be able to monitor integration levels and to compare the cost of capital in the MENA region, both internally and in comparison to other emerging areas included in the analysis.

One important question raised in our project is whether financial contagion carries 'hidden costs' by modifying the cost of equity in emerging markets. The rationale for our investigation can be traced back from Stulz's (1999) simple model describing the relationship uniting integration and the cost of capital. Letting T be the price per unit of risk and σ_i^2 be the local return variance, the risk premium before integration can be defined as $RP = T * \sigma_i^2$. After integration we have:

$$RP^* = \beta \left[T \times \sigma_w^2 \right]$$
$$with \ \beta = \frac{Cov(Ri, Rw)}{Var(Rw)} = \rho \frac{\sigma_i}{\sigma_w} \tag{3}$$
$$\Rightarrow RP^* = \beta \left[T \times \sigma_w^2 \right] = \rho \frac{\sigma_i}{\sigma_w} \times \left[T \times \sigma_w^2 \right] = \rho \sigma_i \sigma_w T$$

The condition for international integration to diminish the cost of capital is therefore:

$$RP^* < RP$$
$$\Leftrightarrow \rho \sigma_i \sigma_w T < T \times \sigma_i^2 \tag{4}$$
$$\Leftrightarrow \rho < \frac{\sigma_i}{\sigma_w}$$

This suggests that market integration diminishes the risk premium if the local investor can diminish portfolio volatility by investing internationally. On the other hand, if correlation is too high or if global volatility increases dramatically, the risk premium increases, and so does the cost of capital. Given this result and the on-going crisis, the question of how the microeconomic cost of capital reacts to international financial contagion appears particularly relevant. To the best of our knowledge, this issue has never been investigated empirically. However, one should distinguish between different types of shocks. In the broadest sense, contagion refers to the cross-country transmission of aggregate shocks that hit different countries and lead to simultaneous negative co-movements.

As mentioned above, there are two main co-existing definitions of this concept: fundamental contagion and shift-contagion. This study contributes to our understanding of how these two types of shocks are transmitted to the real sector, by focusing on the cost of capital. Distinguishing between fundamental and shift-contagion vulnerability will be particularly useful when it comes to formulating policy recommendations. Fundamental contagion can indeed be avoided through policies seeking to shrink market linkages, such as the implementation of capital controls. By contrast, restrictive policies are unlikely to be successful in the presence of shift-contagion since shock transmission operates through a change in the investor's set of beliefs. In that case, the relevant policy question is whether shock transmission stems from the irrational behaviour of investors or from a set of domestic risk factors (Athukorala and Warr, 2002). It should be noted that phases of shift-contagion in the MENA stock markets have been identified in Lagoarde-Segot and Lucey (2010). However, microeconomic transmission mechanisms to the real sector have not yet been investigated.

Turning to institutional investors, one problem is the extent to which they overestimate the short run, thereby affecting long run valuation. Mutual funds managers who benchmark portfolio performance indeed tend to focus on market momentum rather than long-term prospects. In doing so, analysts prioritize quarterly as opposed to annual company reports (a situation described as a "*quarterly report dictatorship*" (Santiso, 1997). This short-term bias is magnified by portfolio diversification: managers can easily cancel some of their positions when their other holdings are well balanced. By contrast, the identification of sound investment opportunities by a company's management requires a longer time horizon. Such dynamics can be particularly harmful in developing countries lacking infrastructures.

In addition, certain authors have questioned the impact of international shareholder dominance on corporate governance. In a world of perfect capital mobility, the dominance of foreign shareholders may lead managers to focus on *one-dimensional* corporate performance measures (e.g. stock prices, return on equity). This tends to bias companies toward adaptive rather than innovative strategies. According to Lazonick and O'Sullivan (1996), shareholder dominance implies the pursuit of liquidity, which is incompatible with the financial commitment required by innovation. These authors do not recognize shareholders as 'principals' who benefit from residual revenue because '*given their quest for liquidity, of all the stakeholders in the modern industrial corporation, shareholders are the ones with the least stake in a particular company as an ongoing entity because, via the stock market, shareholders have the easiest conditions for exit of any stakeholders*' (p.58). Rejecting projects whose returns fail to satisfy investor demand for rapid payoffs may result in a shift of research away from projects with longer-term payoffs. Our research will shed light on how international shareholders affect firm performance in emerging markets.

V. Empirical Methodology and Results

V.1 Contagion and the Cost of Capital

The implications of international financial integration on cost of equity dynamics can be analysed using an asset-pricing model where the expected risk premium on any asset depends on its covariance with the market portfolio. We assume that all investors display homogenous risk-aversion levels:

$$E\left[\left(R_{w,t}\big|\Omega_{t-1}\right)-R_{f^*_t}\right]=E\left[\left(R_{I,t}\big|\Omega_{t-1}\right)-R_{ft}\right]=\gamma_t \qquad (5)$$

We consider two portfolios, an integrated and a segmented portfolio. The corresponding representation of the risk premium are outlined as follows:

$$\begin{cases} E\left[R_{i,t}\big|\Omega_{t-1}\right]-R_{f,t}=\beta_{iI,t-1}\left[E\left[R_{i,t}\big|\Omega_{t-1}\right]-R_{f,t}\right];\forall i \\ E\left[R_{i,t}\big|\Omega_{t-1}\right]-R_{f^*,t}=\beta_{iw,t-1}\left[E\left[R_{w,t}\big|\Omega_{t-1}\right]-R_{f^*,t}\right];\forall i \end{cases} \qquad (6)$$

Where $\beta_{iI,t-1}=\dfrac{\mathrm{cov}\left(R_{i,t},R_{I,t}\big|\Omega_{t-1}\right)}{\mathrm{var}\left(R_{i,t}\big|\Omega_{t-1}\right)}$ represents the time-varying sensitivity of asset i to shocks to

the domestic portfolio I (and reciprocally for $\beta_{iw,t-1}$). In this representation, expectations are formed conditional on the informational vector Ω_{t-1} available at time (t-1). Using equation (5) and the conditional correlation between the individual asset and the relevant portfolio

$p_{iI,t-1}=\dfrac{\mathrm{cov}\left(R_{i,t},R_{I,t}\big|\Omega_{t-1}\right)}{\sqrt{\mathrm{var}\left(R_{i,t}\big|\Omega_{t-1}\right)\mathrm{var}\left(R_{I,t}\big|\Omega_{t-1}\right)}}$ (and reciprocally for $p_{iw,t-1}$) we can rewrite the expected

risk premium under segmentation and integration as follows:

$$\begin{cases} E\left[R_{i,t}\big|\Omega_{t-1}\right]-R_{f,t}=p_{iI,t-1}\dfrac{\sqrt{Var\left(R_{i,t}\big|\Omega_{t-1}\right)}}{\sqrt{Var\left(R_{I,t}\big|\Omega_{t-1}\right)}}\gamma_t\ ;\forall i \\[4ex] E\left[R_{i,t}\big|\Omega_{t-1}\right]-R_{f^*,t}=p_{iw,t-1}\dfrac{\sqrt{Var\left(R_{i,t}\big|\Omega_{t-1}\right)}}{\sqrt{Var\left(R_{w,t}\big|\Omega_{t-1}\right)}}\gamma_t\ ;\forall i \end{cases} \qquad (7)$$

This simple framework highlights how financial integration determines the cost of equity via changes in the risk premium. In particular, a comparison of the risk premium under integration and segmentation shows that integration actually increases the risk premium if:

$$\frac{p_{iw,t-1}}{\sqrt{Var\left(R_{w,t}\big|\Omega_{t-1}\right)}}>\frac{p_{iI,t-1}}{\sqrt{Var\left(R_{I,t}\big|\Omega_{t-1}\right)}} \qquad (8)$$

Equation (8) shows that the risk premium increases if the variation of the international portfolio correlation is higher than the variation of the domestic portfolio correlation, following a similar shock to the risk of the relevant market portfolio for the two categories of investors.

The above mechanism may be relevant in periods of fundamental contagion, when the correlation coefficient rises above its long run value due to an increase in the variance of the global market. It may also be relevant in periods of shift-contagion, i.e. when a structural break in the cross-market linkages make international correlation levels increase *beyond what should be expected from fundamentals* as shocks spread through channels that do not exist in tranquil periods (Forbes and Rigobon, 2002). Shift-contagion has long been observed as a

fixture of emerging market finance, including those of the MENA region (Lagoarde-Segot and Lucey, 2010).

A theoretical literature has argued that contagion vulnerability is a result of investor choices in a context of imperfect information. For instance, Calvo and Mendoza (2000) showed that the incentives for contagion grow with globalization. They showed that in the presence of short selling constraints, the fixed costs of gathering and processing country-specific information increase with the size of the international portfolio. In this context, financial globalization makes country-level portfolio allocations increasingly sensitive to changes in global asset returns and to unverified rumours, which produces volatility, contagion and capital flows. In addition, globalization reduces the variance of the global portfolio, making it a more attractive asset relative to country-level holdings. Assuming that fund managers face a high marginal cost if their chosen portfolio return is lower than the global portfolio returns, they show the existence of multiple equilibrium portfolios mimicking the performance of the global portfolio, implying that significant capital outflows can occur even in the absence of rumours about country returns. These two factors make portfolio allocations sensitive to changes in global asset prices, leading to contagion across markets.

Another seminal contribution by Kodres and Pritsker (2002) explains contagion via rational portfolio rebalancing. They give an example in which three markets are exposed to two common risk factors and two types of idiosyncratic risk shocks (information shocks and liquidity shocks). In this case, a negative idiosyncratic shock in one market makes investors exit that market. This in turn diminishes their exposure to the first common risk factor below its optimal level. The rational response is then to purchase assets in a second market in order to maintain a constant exposure to the first common risk factor. This increases their exposure to the second common risk factor above its optimal level; to which the rational response is to sell assets in a third market. In this framework, portfolio rebalancing can lead to significant cross-market spill-over in asset prices. Model calibration shows that such co- movements are more severe in emerging markets due to the presence of information asymmetries.

Finally, shift-contagion can operates through a change in the investor's set of beliefs. The behavioural finance literature shows that in the context of incomplete information, a rational agent may optimally ignore his private information and instead imitate agents trading before him (a situation referred to as 'informational cascade'). In particular when public information is scarce, less informed investors ('herds') tend to follow investors that are perceived as having more information than their own ('fashion leaders'). Such herding behaviour is more pronounced on the sell side and can induce departure between the observed price and equilibrium price of a financial asset (Bikhchandani et.al, 1992; Zhou and Lai, 2009). It should be noted that irrational trading can have lasting effect on firm performance. Sentiment-induced trading affects stock prices and feeds back to cash flows via several mechanisms (e.g. investment strategies, employee and customer retention, acquisitions, equity issuance...). This in turn can change the fundamental value of the firm, and affects long run prices and resource allocation (Hirshleifer et.al, 2006).

Given the importance of contagion in emerging markets, we argue that the volatility of international linkage levels could lead to an increase in the international risk-premium and the international cost of equity. This mechanism could constitute one microeconomic mechanism by which international financial crises hurt emerging economies.

V.1.1 Data and Sample

Our dataset is taken from the Thomson Reuters database and covers four MENA countries: Tunisia (47 firms), Egypt (200 firms), Morocco (68 firms) and Jordan (220 firms). For each listed firm, we retrieve annual numbers of shares outstanding, annual financial structure (shareholders assets divided by total assets), and annual turnover (annual traded volume divided by market capitalization). The dataset also contains the daily stock price, the value of the market index and an international benchmark (S&P500). These variables dataset is used to generate a set of annual proxies for the cost of equity and shock exposure.

V.1.2. International Cost of Equity

For each company included in the sample, we specify a global asset pricing model that holds annually. Under this approach, the cost of equity depends on a risk free rate and on a term equal to the global market risk premium (the price of risk) multiplied by the stock's beta (the amount of risk). Four main reasons motivate us to use this approach. First, the International CAPM has been showed to be robust against seven other conditional and unconditional specifications of the cost of equity in emerging markets (Barclay et.al, 2010). Second, it fits our theoretical framework seeking to relate variations in the required cost of capital to exposure to global financial shocks for an international investor diversifying into emerging markets. Third, it is parsimonious and appropriate for emerging market firms, subject to data constraints. Finally, as shown in Harvey (2000), the empirical relationship between realized return and global beta is significant and integration and liberalization progressed in emerging markets. This result has been confirmed in more recent studies (Hearne and Piesse, 2009; Bruner et.al, 2008). For each firm in the sample, we therefore run following annual regression:

$$E(R_i) - R_f = \alpha + \beta \left(R_g - R_f \right) + \varepsilon \qquad (9)$$

Where R_g denotes the return on the global S&P 500 index, and the residual ε captures other idiosyncratic components of the cost of capital. The risk-free rate R_f is set to zero. The estimated coefficient β is then used to compute the estimated *ex-post* annual cost of equity through the usual formula:

$$E(R_i) = R_f + \beta \left(R_m - R_f \right).$$

We take the standpoint of a US investor where the time-varying risk free rate R_f the corresponding risk premium (R_m-R_f) are taken from Damodoran' database (2012). A summary of the dataset is shown in Table 2. All variables are taken in US dollars and demeaned over the cross-sectional dimension prior to econometric investigation.

V.1.3. Shock Exposure

Rolling Correlation Coefficients

For each market, we compute rolling annual correlation coefficients:

$$\frac{p_{iw,t-1}}{\sqrt{Var\left(R_{w,t}|\Omega_{t-1}\right)}} \tag{10}$$

This allows remaining in line with the theoretical representation presented earlier. These correlation coefficients capture interdependence across stock markets. As highlighted in Forbes and Rigobon (1999) an increase in a foreign market can drive up the correlation between the domestic market and the foreign market via a higher variance of the foreign market. In other words, an increased correlation coefficient shows that co-movements increase without evidence on a structural break (which would indicate contagion). It can therefore be used as a measure for interdependence across markets.

Systematic Risk Exposure

As an alternative measure of interdependence, we employ a time-varying risk-decomposition model in order to monitor country exposure to international shocks on equity markets. Our approach is conducted in two steps. We first filter country returns using a GARCH-M(1,1) framework. We then plug standardized residuals into a rolling country level global asset pricing model:

$$R_i = \alpha + \beta R_g + \varepsilon_i \tag{11}$$

Where R_i is the rate of return on the market portfolio, R_g is the global rate of return, β is market portfolio beta with respect to the global portfolio, and ε_i is the error term. We use the ratio $\dfrac{\beta^2 Var R_g}{Var R_i}$ to monitor the proportion of the variance of the local market that can be explained by shocks on the variance of the international portfolio. This model is estimated annually.

Global Spillovers

We measure daily spill-overs from the global market to each market by running a set of rolling VAR models. Consider the reduced-form model:

$$r_t = \Phi r_{t-1} + \varepsilon_t \tag{12}$$

Where r_t are the market returns across the year, Φ contains the (NxN) VAR parameters and ε_t are the reduced form disturbances with zero means and constant covariance matrix with variance $E\left[\varepsilon_t^2\right] = \sigma_i^2$. Exposure to global shocks is monitored by observing the value of (*1-p*), where *p* is the p value associated to a Granger test of causality from the global market to each

individual market. The higher (*1-p*) is, the lower the probability of making a type I error by rejecting the hypothesis of no spillover. The model is estimated annually and the optimal lag length is determined through the usual LM tests.

Joint Contagion

We measure exposure to joint endogenous shocks occurring during the global crisis by implementing Baur and Fry's (2009) methodology. This method captures system-wide contagion based on a panel data modelling of market linkages. Pooled indices are regressed on the global market index over the entire sample period. Joint abnormal linkages are detected by observing the significance of the fixed time effect test statistics. The fixed time effect is included for the crisis period only (from 2007 until the end of the sample in 2011). The framework is a regression of the form:

$$r_{it} = \alpha_i + \phi_t + \beta_{i1} r_{global,t} + \varepsilon_{it} \tag{13}$$

In (13), r_{it} is the return of country i at time t, $r_{global,t}$ is the global market factors, respectively. The model also contains a constant α_i for each country, and a fixed time effect ϕ_t which is defined for a period of K days through time across all countries. Error terms ε_{it} are assumed to exhibit conditional autoregressive heteroscedasticity modelled via a GARCH (1,1) process. Following Baur and Fry (2009), equation (15) is estimated in two stages. A univariate GARCH process is first specified separately for each country. The resulting residuals are then pooled and regressed on the fixed time effect ϕ_t. Results are shown in figure 1 and exhibit significant contagion during the crisis period. We take the annual averages of these daily test statistics as indicator of yearly vulnerability to contagion. Table 2 shows the annual average values of our variables for each country included in the database. Table 3 shows the correlation matrix between our spill-over and contagion metrics. These are positively and significantly correlated. We can therefore proceed to the remainder of the analysis with confidence.

Table 2 : Descriptive Statistics : 1998-2011

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Panel 1:Egypt														
(i=200. t=14)														
ICAPM	0,048	0,065	0,056	0,048	0,035	0,043	-0,121	0,054	0,093	0,054	0,035	0,046	0,053	0,037
Finstructure	0,437	0,458	0,463	0,443	0,432	0,432	0,451	0,452	0,474	0,514	0,532	0,546	0,549	0,554
turnover	0,005	0,029	0,032	0,043	0,037	0,066	0,078	0,152	0,228	0,345	0,404	0,951	0,717	0,206
shares	23200000	31600000	33500000	33800000	36800000	35900000	36400000	51400000	69200000	97400000	109000000	117000000	158000000	76800000
Risk	0,179	0,430	0,002	0,005	0,003	0,002	0,000	0,005	0,002	0,010	0,024	0,002	0,016	0,000
Corr	0,423	0,656	-0,049	-0,071	-0,054	-0,046	-0,005	-0,069	0,048	-0,099	0,156	0,045	0,126	0,009
Pvalues	0,036	0,011	0,067	0,881	0,316	0,752	0,886	0,498	0,998	1,000	1,000	1,000	1,000	0,994
Joint	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,091	0,286	0,014	0,050	0,252
Jordan														
(i=220. t=14)														
ICAPM	0,043	0,069	0,052	0,061	0,023	0,055	0,050	0,053	0,054	0,045	0,031	0,042	0,042	0,013
Finstructure	0,556	0,566	0,575	0,578	0,584	0,578	0,591	0,611	0,659	0,646	0,649	0,639	0,640	0,639
turnover	0,049	0,144	0,097	0,166	0,240	0,435	0,904	1,240	1,162	1,391	1,095	0,927	1,023	0,793
Shares	20058506	18215921	17632587	17494930	19864930	19361201	18740600	17814811	22498151	26004492	28144680	28798220	29549987	19441323
Risk	0,012	0,032	0,068	0,000	0,000	0,023	0,001	0,003	0,003	0,002	0,002	0,000	0,003	0,010
Corr	-0,110	0,179	0,261	-0,021	-0,003	0,152	0,023	-0,054	0,051	-0,047	-0,045	-0,018	-0,055	-0,100
Pvalues	0,065	0,003	0,030	0,937	0,835	0,458	0,587	0,648	0,159	0,046	0,997	1,000	0,616	0,912
Joint	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,091	0,286	0,014	0,050	0,252
Morocco														
(i=68.t=14)														
ICAPM	0,044	0,065	0,054	0,059	0,048	0,044	0,040	0,048	0,068	0,050	0,034	0,035	0,033	0,025
Finstructure	0,417	0,421	0,412	0,426	0,444	0,438	0,435	0,415	0,397	0,401	0,404	0,408	0,392	0,391
turnover	0,002	0,026	0,000	0,000	0,000	0,001	0,000	0,000	0,003	0,002	0,001	0,001	0,000	0,000
shares	11396091	10005843	10534899	9738865	9738865	9738865	32424140	30382883	33379265	27860820	28864584	28915113	29436087	23234459
Risk	0,108	0,008	0,275	0,000	0,002	0,026	0,002	0,000	0,008	0,002	0,041	0,001	0,079	0,073
Corr	-0,330	-0,088	0,525	-0,012	-0,040	-0,161	0,045	-0,007	0,087	-0,046	0,204	0,036	0,280	0,270
Pvalues	0,038	0,002	0,056	0,419	0,999	0,655	0,462	0,922	0,864	0,821	1,000	0,755	0,893	0,965
Joint	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,091	0,286	0,014	0,050	0,252
Tunisia														
(i=47. t=14)														
Year	1998,000	1999,000	2000,000	2001,000	2002,000	2003,000	2004,000	2005,000	2006,000	2007,000	2008,000	2009,000	2010,000	2011,000
ICAPM	0,045	0,063	0,052	0,058	0,037	0,049	0,050	0,041	0,050	0,041	0,031	0,043	0,033	0,013
Finstructure	0,287	0,312	0,328	0,362	0,359	0,339	0,329	0,328	0,330	0,353	0,351	0,346	0,343	0,342
turnover	0,024	0,066	0,066	0,042	0,018	0,011	0,386	1,853	0,355	0,019	0,030	0,040	0,040	0,031
shares	6724254	5811452	5811452	5433138	5396869	5396869	5396869	5407273	6847563	12525133	17394000	19176906	22810268	11027761
Risk	0,000	0,004	0,007	0,002	0,026	0,018	0,018	0,004	0,001	0,005	0,000	0,021	0,026	0,009
Corr	-0,018	-0,067	-0,086	0,041	-0,160	-0,135	0,134	0,061	-0,024	0,071	0,017	0,147	0,160	0,092
Pvalues	0,200	0,636	0,107	0,386	0,812	0,946	0,923	0,265	0,922	0,998	1,000	0,986	0,260	0,669
Joint	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,091	0,286	0,014	0,050	0,252

Table 3: Pairwise Correlation Matrix

	Risk	Corr	Contagion	Granger
Risk	1.0000			
Corr	0.8029***	1.0000		
	0.0000			
Contagion	0.1532***	0.0501***	1.0000	
	0.0000	0.0122		
Granger	0.0679***	0.0961***	0.2360***	1.0000
	0.0000	0.0000	0.0000	

Note : this table shows correlation matrix across the financial shock variables estimated on the entire sample. (***), (**), and (*) denote significance at the 1%; 5% and 10% levels, respectively.

Figure 1: Joint Contagion Analysis
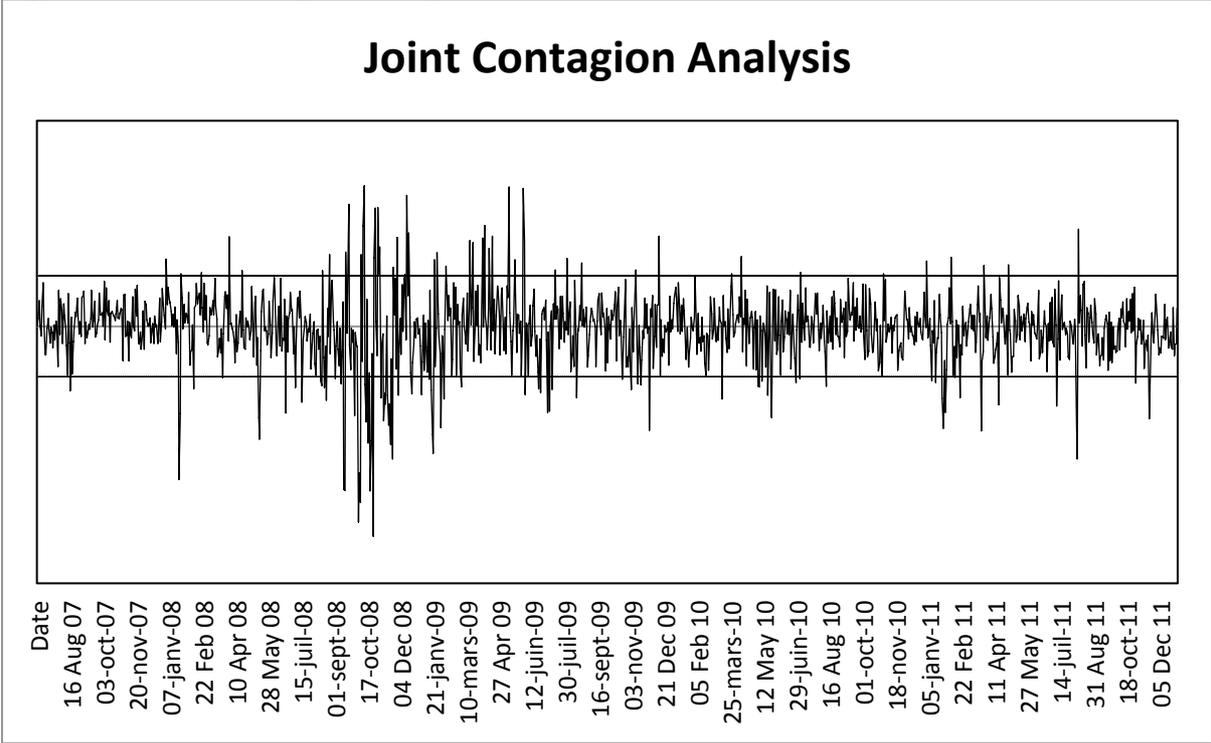
Note: this figure shows the z statistics for the significance of the fixed effects. The dashed line represent the 5% critical value.

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V.1.4. Panel VAR Model

We adopt a panel structural VAR modelling approach in order to model the impact of an increase in financial integration on the international cost of equity for MENA firms. We control for the traditional determinants of the corporate risk premium: liquidity (turnover and numbers of shares) and leverage (financial structure). Our approach can be outlined as follows. Consider the following structural VAR model:

$$\begin{cases} X_{it} = A^*(L)X_{i,t-j} + \Gamma^{-1}\varepsilon_{i,t} \\ \varepsilon_{i,t} = v_i + v_t + v_{it} \end{cases} \tag{14}$$

Where X_{it} is a vector of stationary variables, L is the lag operator and A*(L) is a transformed matrix of coefficients such as $A^*(L) = \Gamma^{-1}A(L)$, where Γ is the matrix of contemporaneous parameters and A(L) the initial matrix of VAR parameters. Fixed time and individual effects (v_i and v_t) are included in the model to accommodate for unobserved individual heterogeneity. Errors v_{it} have zero mean ($E(v_{it}) = 0$). The variance-covariance matrix of reduced form shocks $E(v_{it}, v_{it}^{'}) = \Omega$ is real, symmetrical, and positive definite. To derive impulse response from the model, this matrix is rewritten as:

$$\Omega = KDK'$$

Where D is a diagonal matrix and K a lower triangular matrix. Letting $\mu_{it} = K^{-1}v_{it}$ be a vector of orthogonal residuals with $E(\mu_{it}\mu_{it}^{'}) = E(K^{-1}v_{it}v_{it}^{'}K^{-1'}) = K^{-1}(KDK')K^{-1'} = D$, the moving average representation is:

$$X_{it} = \sum_{i=1}^{n} \sum_{h\geq 0} \phi_h KK^{-1}v_{i,t-h} = \sum_{i=1}^{n} \sum_{h\geq 0} \Phi_h \mu_{i,t-h} \text{ with } \Phi_h = \phi_h K$$

Since the moving average form is obtained by inverting the VAR model, elements of Φ_h are a function of the initial VAR parameters. Orthogonal responses of X_{it} variables to innovations $\mu_{is}, s \leq t$ can be derived via dynamic multiplicators $\frac{\partial X_{it}}{\partial \mu_{is}} = \Phi_{t-s}$, and structural error response functions are then $\forall h \geq 0 \rightarrow \Phi_h$. Error margins are computed by bootstrap (Sims and Zha, 1999). We use a Generalized Impulse Response Functions and Generalized Variance Decomposition framework in order to eliminate the compositional effects of the Choleski decomposition. The presence of lagged endogenous variable and individual fixed effects biases OLS and Within-Group estimator.[1] Parameters of the SVAR model are thus estimated

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[1]Nickell (1981) showed that this bias goes in the opposite direction on the relationship between exogenous variables and the lagged mean-differenced dependent variable. For instance, if an exogenous variable is negatively related to the lagged, mean differenced dependent variable, its estimated parameter will be biased upwards.

via system GMM. We apply a Helmert transformation to our dataset by computing weighted deviations from forward means:

$$\begin{cases} X_{i,t}^* = c_t \left[X_{it} - \frac{1}{T-t} \left(X_{i,t+1} + ... + X_{i,T} \right) \right] \\ c_t = \sqrt{\frac{T-t}{T-t+1}} \end{cases}$$

(15)

One key feature of this transformation is that weights c_t preserve the variance of the dataset. In addition, the absence of serial correlation of error terms is preserved but transformed error terms become orthogonal to the untransformed variables. The latter are hence used as instruments (Arellano and Bover, 1995) in a system GMM framework.

V.2 Empirical Results

The main results are reported in Table 4 and Figures 2-6. The table reports the estimates of the coefficients of the VAR systems where the fixed effects have been removed, and the coefficients for four alternate model specifications corresponding to the different financial shocks variables. Figure 2-6 present graphs of the impulse-response functions and the error bands. For space-saving purposes we only report the impact of a financial shock on the cost of equity; however the other impulse response functions are available upon request.

Inspection of the static results highlights that in each country, the cost of equity depends upon its past value. This result indicates that the expected risk premium at time t is influenced by its previous level at time t-1. This dynamic persistence is robust across all specifications and suggests that a short spanned increase in risk levels equity will show hysteresis.

Our results also show that an increase in financial shock exposure leads to an increase in the international cost of equity. Results for the whole sample show that the international cost of equity responds positively to a shock on correlation levels, inverted p-values, systematic risk exposure and joint contagion. Applying the same methodology in country sub-samples, we find that in the case of Egypt, the coefficients associated to pairwise correlation, VAR inverted p-values and systematic risk exposure levels are all positive and significant. In the case of Jordan, the coefficients associated to pairwise correlation, VAR inverted p-values and joint contagion are all positive and significant. For Moroccan firms, the coefficients associated to VAR inverted p-values, systematic risk exposure and joint contagion are all positive and significant. Finally, turning to Tunisia, the coefficients associated to VAR inverted p-values and joint contagion are all positive and significant.

These results are confirmed by the impulse response function analysis. The Figures show the response of the cost of equity ICAPM to a one standard deviation in one of the shock vulnerability variables, for each model estimated on a country basis. The orthogonalization of VAR residuals discussed earlier permits us to interpret the figures as response to a structural shock on financial vulnerability. For each country, the figures are in line with the static analysis and highlight that an increase in shock exposure leads to a temporary increase in the cost of equity. Overall, these results suggest that the international cost of equity rises in periods of externally-induced financial stress. As discussed earlier, this mechanism operates through portfolio adjustment: under financial integration, systematic risk exposure shifts from a domestic CAPM where systematic risk is measured by the variance of the local index, to an

International CAPM where investors determine expected returns by monitoring firm exposure to international shocks on the global market index. In tranquil periods, the international betas of emerging market firms are generally low and this mechanism leads to a lower risk premium. However, the causality may reverse in crisis periods when the gains from international diversification are offset by a sudden increase in co-movements. In other words, financial liberalization can lead to a higher cost of equity for listed firms in periods of externally induced financial stress. Such mechanisms are likely to take in low transparency environments were investors have access to incomplete information and are prone to mimetic contagion.

From a policy perspective, these results suggest that while financial integration carries long run benefits, it goes along with destabilization costs for internationally integrated firms in times of international turmoil. In addition, our results suggest that destabilization is not confined to the macroeconomic transmission mechanisms, but may also affect firm-specific discount rates. Such dynamics may partly explain the observed drop in aggregate investment in the MENA region in the aftermath of the global crisis (given that the cost of capital negatively affects the net present value of investment projects).

Table 4 : System GMM Estimations

Dependent variable ICAPM	Egypt (N.obs=1982)		Jordan (N.obs=2170)		Morocco (N.obs=668)		Tunisia (N.obs=509)		Whole sample (N.obs=5329)	
Model #1	Coefficient	T stat	**Coefficient**	**T stat**	**Coefficient**	**T stat**	**Coefficient**	**T stat**	**Coefficient**	**T stat**
$ICAPM_{-1}$	0.0033*	1.949	0.024	0.827	0.098**	2.063	0.032	0.407	0.004**	2.017
$Turnover_{-1}$	0.000	0.537	0.001	0.921	0.033	1.719	0.004***	5.280	0.001	1.768
$Shares_{-1}$	0.004***	2.886	0.000	-0.158	0.002	0.693	-0.003	-1.819	0.001	1.207
Financial structure$_{-1}$	0.005	0.406	-0.020	-1.103	0.021**	1.961	-0.008	-0.781	-0.004	-0.428
$Correlation_{-1}$	0.031***	4.433	0.037***	3.062	0.009	0.850	-0.014	-1.109	0.026***	5.102
Sargan	0.968		0.983		0.687		0.899		1.000	
AR(1)	0.306		0.244		0.172		0.597		0.255	
Model#2	**Coefficient**	**T stat**	**Coefficient**	**T stat**	**Coefficient**	**T stat**	**Coefficient**	**T stat**	**Coefficient**	**T stat**
$ICAPM_{-1}$	0.003*	1.922	0.016	0.557	0.067*	1.657	0.010	0.116	0.008	1.473
$Turnover_{-1}$	0.000	0.298	0.000	0.503	0.011	0.519	.001***	2.236	0.002***	3.427
$Shares_{-1}$	0.008***	5.205	0.000	-0.099	0.003	1.140	0.001	0.525	-0.017***	-4.939
Financial structure$_{-1}$	0.011	0.925	-0.026	-1.378	0.017	1.624	-0.022	-1.612	0.019	1.185
$Pval_{-1}$	0.028***	6.107	0.023***	8.649	0.021***	6.787	.029***	7.248	0.208***	5.935
Sargan	0.982		0.990		0.607		0.873		1.000	
AR(1)	0.302		0.243		0.239		0.726		0.254	
Model#3	**Coefficient**	**T stat**	**Coefficient**	**T stat**	**Coefficient**	**T stat**	**Coefficient**	**T stat**	**Coefficient**	**T stat**
$ICAPM_{-1}$	0.003*	1.959	0.019	0.683	0.085**	2.124	0.020	0.240	0.004**	2.008
$Turnover_{-1}$	0.000	0.599	0.001	1.187	0.037*	1.906	0.001***	4.189	0.001	1.625
$Shares_{-1}$	0.004***	3.196	0.002	0.763	0.005	1.308	-0.010***	-5.515	0.004***	3.111
Financial structure$_{-1}$	0.007	0.585	-0.018	-0.979	0.018	1.560	0.006	0.687	-0.006	-0.645
Systematic-1	0.048***	4.870	0.425	6.221	0.094***	2.988	-0.037***	-8.119	0.077***	6.698
Sargan	0.967		0.985		0.654		0.903		1.000	
AR(1)	0.303		0.257		0.139		0.443		0.255	
Model#4	**Coefficient**	**T stat**	**Coefficient**	**T stat**	**Coefficient**	**T stat**	**Coefficient**	**T stat**	**Coefficient**	**T stat**
$ICAPM_{-1}$	0.003*	1.948	0.020	0.721	0.115**	2.464	0.102	1.162	0.005*	1.757
$Turnover_{-1}$	0.000	0.826	0.001	1.245	0.030	1.763	0.001***	3.851	0.001**	2.011
$Shares_{-1}$	0.002	1.722	0.003	0.995	0.004	1.205	-0.005**	-2.258	0.000	-0.052
Financial structure$_{-1}$	0.007	0.586	-0.018	-1.014	0.024**	2.084	-0.011	-0.752	-0.004	-0.366
$Joint_{-1}$	0.024	0.458	0.461µ**	6.173	0.045***	2.985	1.087***	6.954	0.084***	4.481
Sargan	0.972		0.977		0.675		0.912		1.000	
AR(1)	0.303		0.228		0.212		0.294		0.230	

Note: For each country, four five-variable VAR models are estimated by System GMM. Country-time and fixed effects are removed prior to estimation. Heteroskedasticity adjusted t-statistics are showed in the second column. For each model we report pvalues for the Sargan test of overidentifying restrictions and the Arellano and Bover test for autocorrelation of residuals.

**Figure 2: Impulse Response Functions: Egypt (Model #1 to Model#4)**

response of ICAPM to corr shock

response of ICAPM to Risk shock

response of ICAPM to joint shock

response of ICAPM to pval shock
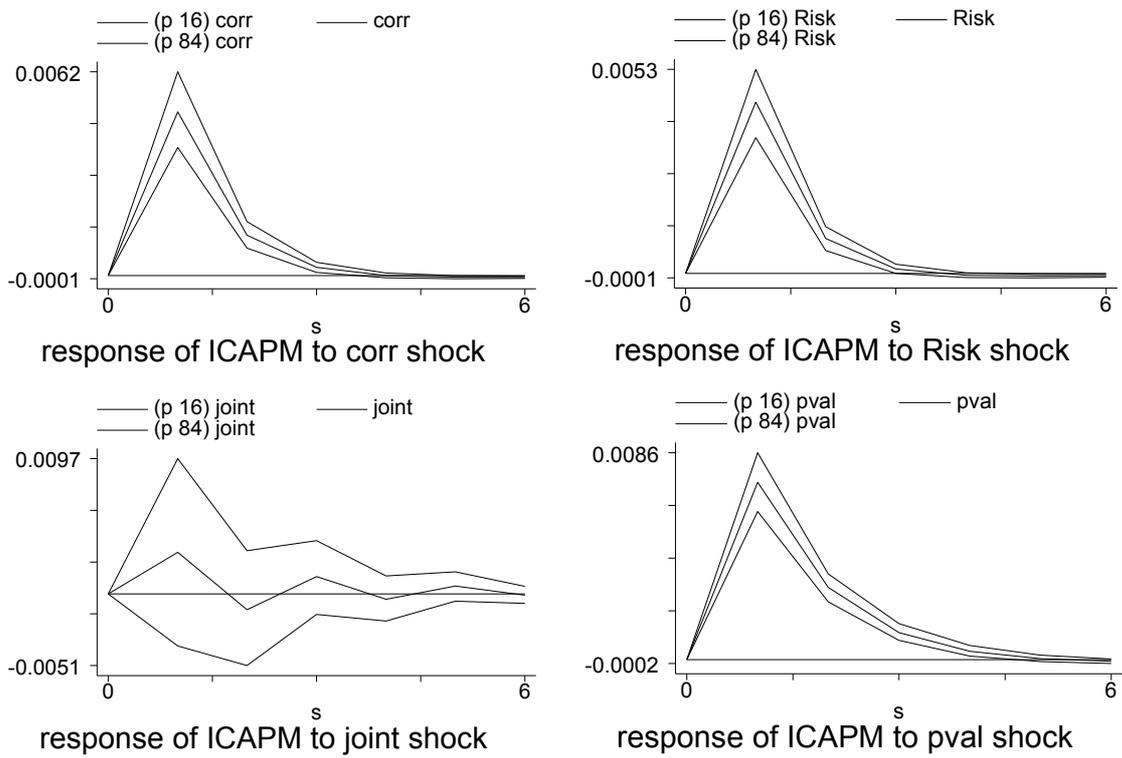
Figure 3: Impulse Response Functions: Tunisia (Model #1 to Model#4)

response of ICAPM to corr shock

response of ICAPM to Risk shock

response of ICAPM to joint shock

response of ICAPM to pval shock
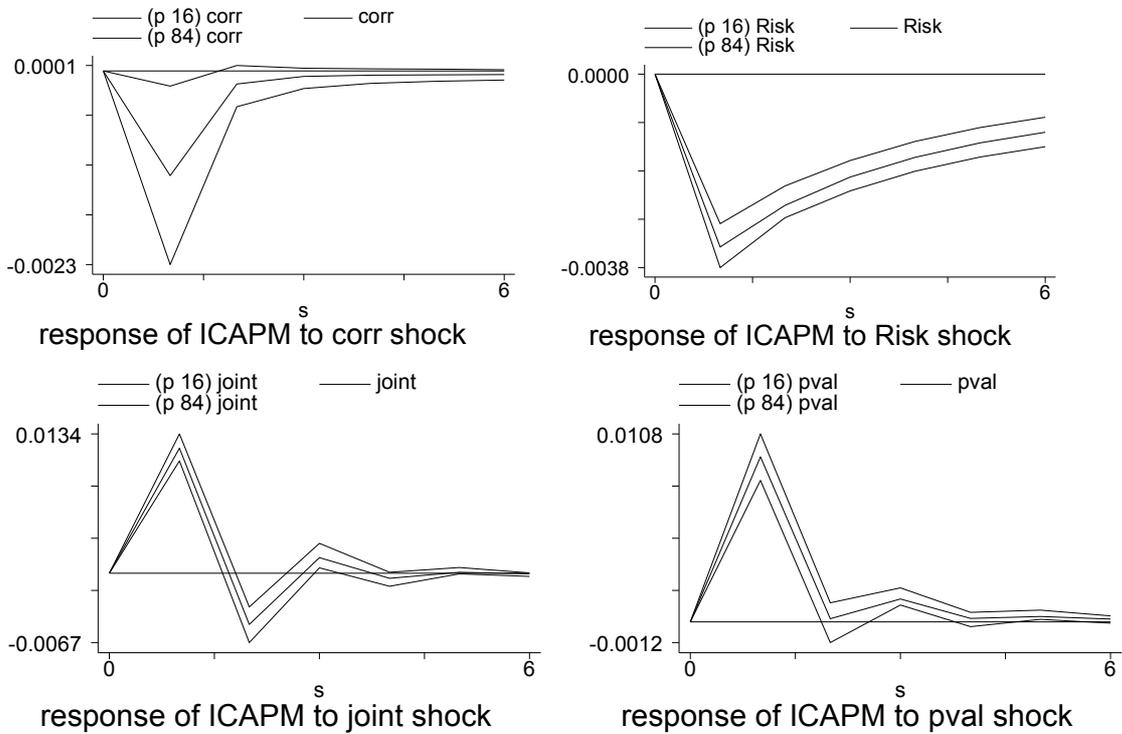
Figure 4: Impulse Response Functions: Jordan (Model#1 to Model #4)

response of ICAPM to corr shock

response of ICAPM to Risk shock

response of ICAPM to joint shock

response of ICAPM to pval shock
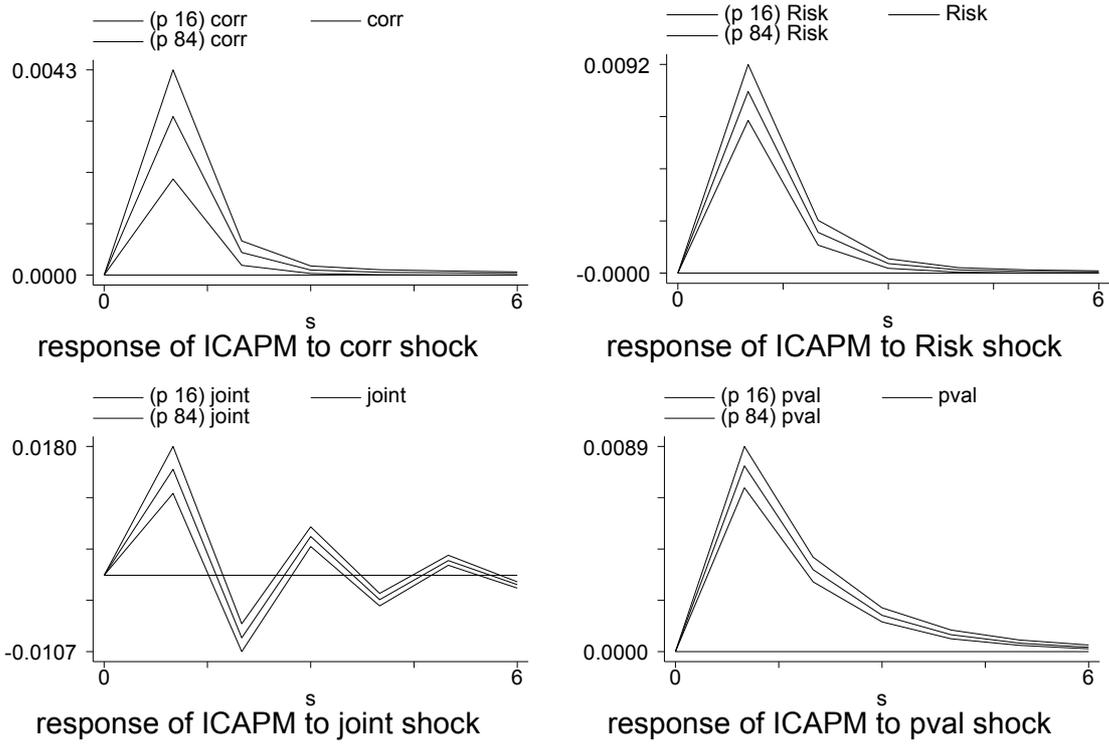
Figure 5: Impulse Response Functions: Morocco (Model#1 to Model #4)

response of ICAPM to corr shock

response of ICAPM to Risk shock

response of ICAPM to joint shock

response of ICAPM to pval shock

42
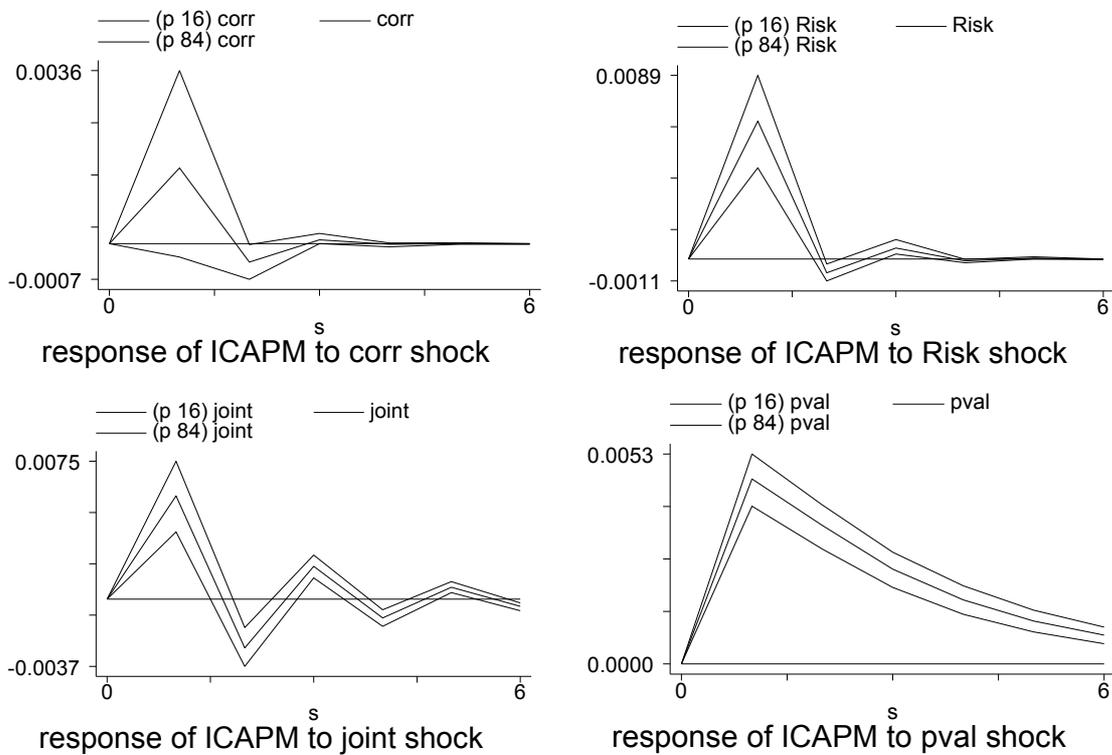
Figure 6: Impulse Response Functions: Whole Sample (Model#1 to Model #4)

response of ICAPM to Risk shock

response of ICAPM to corr shock

response of ICAPM to pval shock

response of ICAPM to joint shock
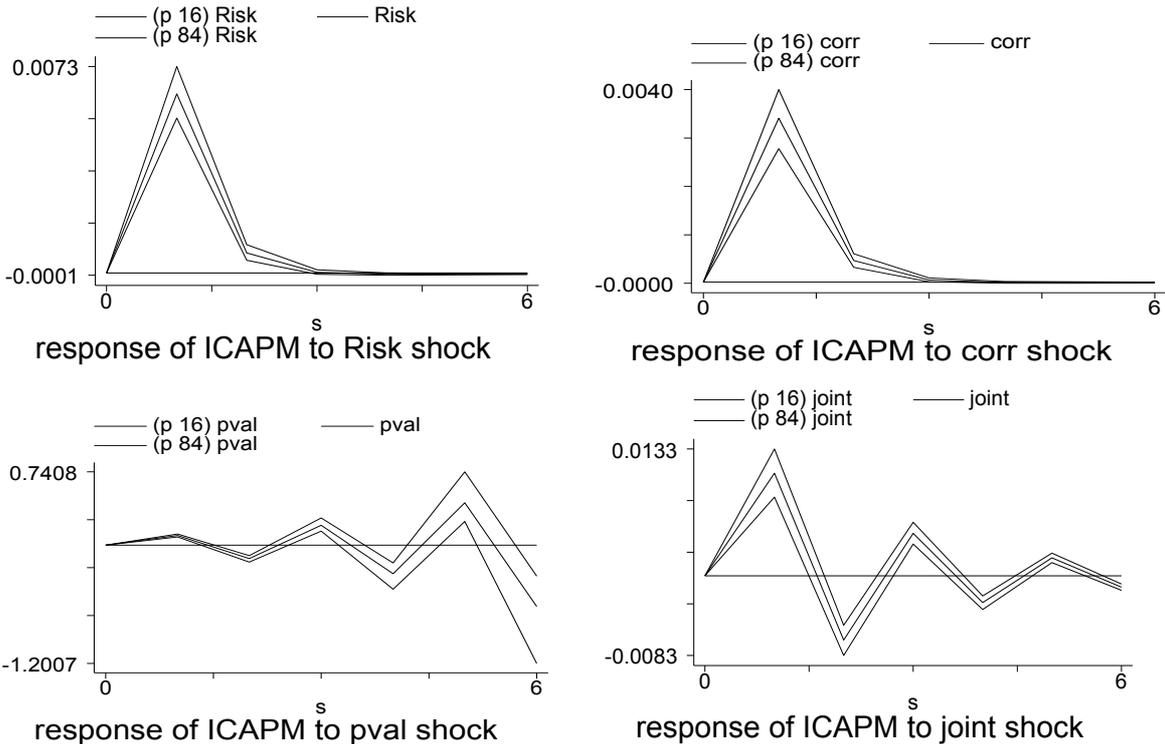
VI. Conclusions and Policy Recommendations

During times of financial stability, financial integration and liberalization mean that firms have unrestricted access to foreign sources of funding; *i.e.*, corporations can issue stocks or bonds on international financial markets. Due to the liberalized access to various sources of funding, firms will be able to raise capital at low costs. And if financial markets are not liberalized and a firm is forced to raise capital locally, then its cost of equity is likely to be higher than that of a company with unrestricted access to the international capital markets. Therefore, one would expect the restrictions to the local capital market to raise a firm's marginal cost of equity and therefore raise the rate of interest. While financial integration can spur growth and development during periods of financial stability, capital account liberalization can however have undesirable effects on firm-level financing conditions when global financial markets are in turmoil with devastating consequences on investment and subsequently on the rate of growth of GDP.

The empirical results of our study are in line with the theoretical linkages uniting cost of equity variations and global volatility suggesting that financial integration leads to a higher cost of equity in turmoil periods. From a policy perspective, these results suggest that while financial integration carries long run benefits, it goes along with destabilization costs in times of international crises periods. Our results show that destabilization is not confined to the macroeconomic level but also affects the microeconomic cost of capital. This may partly explain the observed drop in aggregate investment in the MENA region in the aftermath of the global crisis (given that the cost of capital negatively affects the net present value of investment projects). The system GMM equation and panel IRF unambiguously show that financial shocks have spurred an increase in the microeconomic cost of capital in Egypt, Tunisia, Jordan and Morocco, controlling for lagged cost of capital, financial structure, stock liquidity and number of shares. Our study's message is clear: external financial shocks revert the expected negative relationship between financial integration and the cost of capital. This is in line with the extension of Stulz's (1999) model.

The policy challenge is therefore to protect emerging economies from hot capital flows and global liquidity shocks, while reaping the benefits of integration. Given the already observed low levels of portfolio investment in the region, we argue that capital market segmentation and financial repression policies would have a small impact on stability and bring undesirable macroeconomic results.

In this context, the development of MENA's financial sector should be a top priority on the reform agenda. Stock and bond markets are sometime virtually absent and firms cannot raise capital domestically or internationally. Increased financial integration within the MENA region would lower the vulnerability of those markets to international shocks and is expected to bring considerable benefits to MENA's investors by rendering capital more mobile across borders and by lowering the cost of capital. As a result, a more liquid capital market would offer lower borrowing costs for MENA's corporate sector wishing to raise funds locally and would lower its exposure to the short term speculative capital inflows.

Increased financial liberalization within the MENA region is also expected to enhance regional intermediation of financial resources through close integration of financial markets and increased access of MENA's investors to regional financial markets to finance

investment. In addition, MENA's investors will have access to a variety of risks adjusted rates of return to enhance the efficiency of portfolio allocation and diversification, which will foster the efficiency of MENA's financial markets. Increased liberalization within the MENA region is expected to attract important portfolio investments to the region for diversification purposes.

The enhancement of MENA's local capital markets, especially stock markets is also another way to dampen the effects of the global financial crises, and will help reduce the exposure of private corporations to currency mismatches due to foreign borrowings. Those corporations will be able to raise funds locally and reduce their exposure to external financial shocks. They will also reduce any currency mismatch (exchange rate risk) in their balance sheets, and dampen the implications of any sudden outflows of capital emanating from the current crisis or from other financial shocks.

One way to protect from the mechanisms highlighted in this study would be to implement stricter informational disclosure regulation (accounting norms, auditing requirements), in order to prevent waves of irrational mimetic herding among uninformed investors. Previous studies have showed that imperfect information results in mimetic trading. This induces significant increases in the correlation between the domestic and international market indices during crisis periods, ultimately leading to an increase in the cost of equity. Such transparency reforms should be made in the context of increased south–south trade and financial integration, which would help consolidate the markets and minimize contagion vulnerability. Recent examples of such policies in emerging countries include the integration of bond markets in South East Asia, or the ongoing prudential reforms in South Korea, Malaysia and Indonesia. International financial integration should remain a long run policy objective. However, the associated risks should be fully acknowledged and tackled via domestic reforms and international cooperation.

REFERENCES

Aamer Abu-Qarn & Suleiman Abu-Bader, 2007. "Structural Breaks in Military Expenditures: Evidence for Egypt, Israel, Jordan and Syria,"Working Papers 231, Ben-Gurion University of the Negev, Department of Economics.

Adelman, Irma & Yeldan, Erinc, 2000. "Is this the end of economic development?", Structural Change and Economic Dynamics, Elsevier, vol. 11(1-2), pp. 95-109, July.

Allen, F. and Santomero, A. M., 2001.What do financial intermediaries do? *Journal of Banking & Finance*, Elsevier, vol. 25(2), pages 271-294, February.

Akdogan, H, 1997. International security selection under segmentation: theory and application. *Journal of Portfolio* 21, 33-40.

Analyses et propositions du Forum Euro-Méditerranéen des Instituts Economiques (Femise).''Profil PaysMaroc." , Institut de la Méditerranée, France, Economic Research Forum,Egypte, and Femise coordinators, 2006.

Arellano, M., Bover, O., 1995.Another look at the instrumental variable estimation of error component models. *Journal of Econometrics* 68, 29-51.

Athukorala, P.-C.andWarr, P. G., 2002. Vulnerability to a Currency Crisis: Lessons from the Asian Experience, *The World Economy*, 25 (1), pp. 33–57.

Balakrishnan R, Danninger S, Elekdag S., and Tytell I (2009).The Transmission of Financial Stress from Advanced to Emerging Economies, *IMF WP/09/133*.

Bikhchandani, S., Hirshleifer, D., Welch, I., 1992. A theory of fads, fashion, custom and cultural change as information cascades. *Journal of Political Economy* 100, 992–1026.

Baur, D. G. and Fry, R. A., 2009. Multivariate contagion and interdependence*, Journal of Asian Economics*, Elsevier, vol. 20(4), pages 353-366, September.

Beirne J, Guglielmo M, Schulze-Ghattas M, and Spagnolo N (2008). : "Volatility Spillovers and Contagion from Mature to Emerging Stock Markets," *IMF Working Papers 08/286*, International Monetary Fund.

Bekaert, G. and Harvey, C.R., (2000). "Foreign speculators and emerging equity markets", *Journal of Finance*, Vol. 55, pp. 565-614.

Bekaert, G., Harvey, C. R. and Ng, A., 2005. "Market Integration and Contagion", *The Journal of Business*, University of Chicago Press, vol. 78(1), pages 39-70, January.

Ben Naceur, S. and Labidi, C. (2009). Middle East and North Africa Region: Financial Sector and Integration. *www.Qfinance.com*

Calvo, G., Izquierdo, A., and Mejia, L. (2008) "Systemic Sudden Stop: The Relevance of Balance-Sheet Effects and Financial Integration*," NBER Working* Paper No. 14026.

Calvo, Guillermo A., and Mendoza, Enrique G. (2000). "Capital-Markets Crises and Economic Collapse in Emerging Markets: An Informational-Frictions Approach," *American Economic Review*, American Economic Association, vol. 90(2), pages 59-64, May.

Calvo, Guillermo A., and Mendoza, Enrique G. (2000). "Rational contagion and the globalization of securities markets," *Journal of International Economics*, Elsevier, vol. 51(1), pages 79-113, June.

Caporale, G. M., Amor, T. H., and Rault, C., (2009), International Financial Integration and Real Exchange Rate Long-Run Dynamics in Emerging Countries: Some Panel Evidence. DIW Berlin, German Institute for Economic Research, Discussion Papers of DIW Berlin 941

Cardarelli, Roberto, SelimElekdag, and SubirLall, 2009. "Financial Stress, Downturns, and Recoveries, Chapter 4 of the October 2008 WEO report available at http://www.imf.org/external/pubs/ft/...8/02/index.htm

Chari, A. and Henry, P. B., 2004. Risk Sharing and Asset Prices: Evidence from a Natural Experiment, *Journal of Finance* 59(3, June): 1295-324.

Chen, K. C.W., Chen, Z. and Wei, J., (2009). Legal protection of investors, corporate governance, and the cost of equity capital, *Journal of Corporate Finance* 15, 273-289

Chen, K. C.W., Chen, Z., and Wei, J., 2011. Agency costs of free cash flows and the effect of shareholder rights on the implied cost of capital*, Journal of Financial and Quantitative Analysis* 46, 171-207.

Collins, D. and Abrahamson, M. (2006) "Measuring the Cost of Equity in African Financial Markets" *Emerging Markets Review*, 7.

Damodaran, Aswath. Equity Risk Premiums (ERP): Determinants, Estimation and Implications – The 2012 Edition (March 14, 2012). Available at SSRN: http://ssrn.com/abstract=2027211 orhttp://dx.doi.org/10.2139/ssrn.2027211

De Los Rios, A., (2007), Exchange Rate Regimes, Globalization and the Cost of Capital in Emerging Markets. Bank of Canada Working Papers 07-29

Diamond, D. W., (1984). Financial Intermediation and Delegated Monitoring, *Review of Economic Studies*, Wiley Blackwell, vol. 51(3), pages 393-414, July.

Dungey, M., Fry, R., González-Hermosillo, B. and Martin, V.L. (2005) "Empirical modelling of contagion: a review of methodologies." *Quantitative Finance*, Taylor and Francis Journals, vol. 5(1), pages 9-24.

Edison. H. J. and Warnock, F. E., (2003). Cross-Border Listings, Capital Controls, and U.S. Equity Flows to Emerging Markets, IMF Working Papers03/236, International Monetary Fund.

Forbes, K., and Rigobon, R. (2000) "Contagion in Latin America: Definitions, Measurement, and Policy Implications", NBER Working Papers 7885, National Bureau of Economic Research, Inc.

Forbes K. and Chinn M., (2004), "A Decomposition of Global Linkages in Financial Markets Over Time," *The Review of Economics and Statistics*, Vol. 86, Issue 3, pp. 703–22.

Frank, N., González-Hermosillo B., and Hesse H. (2008) "Transmission of Liquidity Shocks: Evidence from the 2007 Subprime Crisis," IMF Working Paper 08/200 (Washington: International Monetary Fund).

Frank, N., B. Gonzalez-Hermosillo and H. Hesse (2008), "Global Transmission of Liquidity Shocks: Evidence from the 2007 Subprime Crisis," IMF working paper

Gerlach, R., Chen, C., Lin, D. & Huang, M.-H. (2006). Asymmetric Responses of International Stock Markets to Trading Volume. Physica A: Statistical Mechanics and its Applications, 2, 422-444.

Glosten, L. R. and Milgrom, P. R., (1985). Bid, ask and transaction prices in a specialist market witH heterogeneously informed traders, *Journal of Financial Economics*, Elsevier, vol. 14(1), pages 71-100.

Harvey, Campbell R, (1995). "Predictable Risk and Returns in Emerging Markets," *Review of Financial Studies*, Society for Financial Studies, vol. 8(3), pages 773-816.

Henry, P. B., (2000). Stock Market Liberalization, Economic Reform, and Emerging Market Equity Prices, *Journal of Finance*, American Finance Association, vol. 55(2), pages 529-564, 04.

Hesse, Heiko & GonzÃ¡lez-Hermosillo, Brenda , (2009). "Global Market Conditions and Systemic Risk," IMF Working Papers 09/230, International Monetary Fund.

Hirshleifer, D., Teoh, S.H., (2003). Herd Behavior and cascading in capital markets: a review and synthesis. *European Financial Management* 9, 25–66.

Hirshleifer, D., Subrahmanyam , A., Titman , S., (2006). Feedback and the success of irrational investors. *Journal of Financial Economics* 81, 311-338.

Hutchison, Michael M. & Noy, Ilan, (2006)."Sudden stops and the Mexican wave: Currency crises, capital flow reversals and output loss in emerging markets," *Journal of Development Economics,* Elsevier, vol. 79(1), pages 225-248, February.

Iatridis, G.E., (2012). Audit quality in common-law and code-law emerging markets: Evidence on earnings conservatism, agency costs and cost of equity. *Emerging Markets Review* 13, 101-117.

Kaminsky G, and C Reinhardt (2003). Financial Markets in Times of Stress, *Journal of Development Economics*, Vol. 69 No. 2, 451-470

Kim, E. H. and Singal, V., (2000). Stock Markets Openings: Experience of Emerging Economies, *Journal of Business* 73, pp. 25-66.

Kini, O. and Mian, S., (1995). Bid-ask spread and ownership structure, *Journal of Financial Research* 58, 401-414.

Kodres, Laura E., and Pritsker, Matt G. (2002) "A Rational Expectations Model of Financial Contagion".*Journal of Finance*, Vol. 57, pp. 769-799.

Lagoarde-Segot, T. and Lucey, B. M. (2006)."Financial Vulnerability in Emerging Markets.Evidence from the Middle East and North Africa". *The Institute for International Integration Studies Discussion Paper Series*, iiisdp114.

Lagoarde-Segot, T., and Lucey, B.M., (2009). Shift-contagion vulnerability in the MENA stock markets, *The World Economy*, 32(10), pp. 1478-1497.

Lazonick, W. and O'Sullivan, M., (1996). Organization, Finance, and International Competition, *Industrial and Corporate Change*, 5, 1, 1996, 1-49.

Merton, Robert C., 1980. "On estimating the expected return on the market :An exploratory investigation," Journal of Financial Economics, Elsevier, vol. 8(4), pages 323-361, December.

Merton, Robert C. (1973). Theory of rational option pricing, *Bell Journal of Economics and Management Science*, 4 (1), 141-183.

Mendoza, E.G., Quadrini, V., and Ríos-Rull, J-V., (2009). Financial Integration, Financial Development, and Global Imbalances. *Journal of Political Economy*, 117 (3), 371-416.

Martin, P., (2010). "Regional and Global Financial Integration: an Analytical Framework. Global and Regional Financial Market Integration", Routledge, Asian Development Bank.

Neaime, S., (2012). "The Global Financial Crisis, Financial Linkages and Correlations in Returns and Volatilities in Emerging MENA Stock Markets," *Emerging Markets Review*, Vol. 13 (2), pp. 268-282.

Papademos L (2010). "Financial integration and stability: the legacy of the crisis", European Central Bank and the European Commission, Frankfurt am Main, 12 April 2010.

Patro, D., and Wald, J., (2005). Firm characteristics and the impact of emerging market liberalization, *Journal of Banking and Finance* 29, 1671-1695.

Rhee, S. Ghon & Wang, Jianxin, (2009). "Foreign institutional ownership and stock market liquidity: Evidence from Indonesia," *Journal of Banking and Finance*, Elsevier, vol. 33(7), pages 1312-1324, July.

Rubin, A., (2007). Ownership Level, Ownership Concentration and Liquidity, Journal of Financial Markets, Vol. 10, pp. 219-248.

Santiso, J., (1997). Wall Street face à la crise mexicaine: une analyse temporelle des marchés émergents, *Les Etudes du CERI*, 34.

Sharpe, William F. (1964). "Capital Asset Prices:A Theory of Market Equilibrium Under Condiof Risk." *Journal of Finance*. September, 19, pp. 425–42.

Sias, R. et al., (2006). Changes in Institutional Ownership and Stock Returns: Assessment and Methodology, *Journal of Business*, Volume 79, number 6, 2869-2910.

Sims, C.A., Zha, T., (1999). Error bands for impulse responses. Econometrica 67, 1113-1155.

Stulz, R. M., (1999). Globalization, Corporate Finance, And The Cost Of Capital, *Journal of Applied Corporate Finance,* Morgan Stanley, vol. 12(3), pages 8-25.