The Relationship between Financial Integration and Stock Market Efficiency: Evidence from the Pre-And Post-Global Financial Crisis

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Abstract

The aim of this paper is to study the potential effect of the financial integration and market microstructure in informational efficiency, in the context of the global financial crisis of 2008-2009. Our sample comprises ten developed and African emerging markets over the period from 2003 to 2012. Using the same methodology adopted, our findings show several interesting facts. First, the markets that are more integrated with the US market are also more efficient. Moreover, this significant and positive association is established in both subgroups of developed and African stock markets. Second, the relationship between informational efficiency and financial integration loses its explanatory power over the global financial crisis period and during which African emerging markets seem to be more volatile than their developed counterparts. Overall, our results confirm that the potential benefits of financial integration process are important in the African region, which might attract foreign investors hoping not only to maximize the expected return of their portfolio but also to minimize the associated risk.

Keywords: Liberalization · financial integration · Informational efficiency · Global financial crisis developed · African stock markets

Introduction

Over the past three decades, financial markets have become more and more integrated, following the gradual removal of several restrictions on cross-border capital flows [1]. This has led to an increase in comovement across national stock markets. The purpose behind this great wave of financial liberalization is to enhance informational efficiency and stimulate long-term economic growth.

Indeed, emerging and developing market are often characterized by low liquidity, little trading volume, high transaction costs and presence of information asymmetry. According to international guidelines based on the recommendations by the IMF and World Bank, the practical solution to these financial problems is the opening of stock markets to the outside world. Financial openness is supposed to facilitate foreign investors' access to domestic markets, which may in turn encourage more capital inflows, increase market liquidity and consequently improve the informational efficiency. Efficient stock prices enhance allocational efficiency of capital A higher quality of capital allocation ultimately leads to higher productivity and rapid economic growth.

However, the succession of more and more severe financial crises and the significant increase in stock market volatility has shown that financial liberalization process also involves certain risks. This has called into question the planned objectives of financial liberalization process (especially in terms of economic growth) and has raised an academic and political debate on the desirability of the free flow of capital for the emerging economies [2]. Confirming the finding that highlights in previous research, the lack of robust evidence that financial integration systematically increases growth. As a result, several authors such as and other have pursued a new avenue of research by trying to address the issue about the initial conditions necessary to prepare the ground for financial openness. These researchers have started from a point of view that risks can never be completely avoided, but there are certain "thresholds" to respect in order to obtain the full indirect benefits of financial liberalization and reduce the associated risks. In the same order of ideas, have indicated that positive and significant effect of financial integration on growth is closely linked to the existence of preconditions such as the quality of governance of private and public institutions, the degree of transparency of government activities, the level of corruption and the effectiveness of legal and judicial frameworks. have found that countries must fulfill certain conditions relating to the degree of economic, institutional and financial development and the level of

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public spending, to reap the benefits of integration. According to, it is important to be well prepared for financial openness, particularly by strengthening banking regulation and supervision, adopting a more flexible exchange rate regime and an appropriate monetary policy framework, implementing countercyclical macroprudential rules and temporary controls on short-term capital flows [3].

But the current financial crisis started in the US housing market in 2007 and spread to many developed countries shows that even countries characterized by a well-developed financial system experienced periods of financial instability. This financial instability could have negative effects in growth.

Literature Review

One of the main objectives of financial liberalization process is to improve the efficiency of capital markets. Indeed, in the context of financial liberalization, there has been hope that foreign investors' access to local markets improves their degree of liquidity and transparency which consequently can promote their performance.

Therefore, a review of theoretical and empirical literature addressing the relationship between financial liberalization and the concept of informational efficiency, gives rise to two main totally divergent streams of research. The first stipulates that financial liberalization enhances the level of informational efficiency, either by increasing the quality and quantity of information available on financial markets and resulting from increased competition between local and foreigners investor, or by promoting and encouraging foreign ownership (increasing proportion of domestic securities held by foreign investors). In other words, the presence of foreign investors on the domestic market facilitates rapid dissemination of information on the international market and encourages significant inflows of capital, which improves financial market liquidity. Thus, a liquid market encourages foreign and local investors to exploit arbitrage opportunities. After the disappearance of these arbitrage opportunities, the financial asset prices converge towards their equilibrium value, which leads to a reduction in sources of inefficiency [4]. The second supports the idea that too rapid and uncontrolled liberalization process leads to dysfunctions of financial markets illustrated by serious economic and financial crises (for example, the Asian crisis in 1997, the Internet bubble in 2001, the global economic crisis. These recurring financial crises are the result of significant increase in financial instability. In this context, indicate that the persistence of this financial instability is mainly explained by the emergence of speculative bubbles and the increasing of the irrational investor behaviours (mimetic and gregarious behaviour, etc.). Therefore, financial disorders may be considered as evidence of inefficiency and imperfection of financial markets. Thus, for a better understanding of the relationship between financial integration and informational efficiency, we treat, on the one hand, the direct link between the two concepts mentioned above (efficiency and integration) and, on the other hand, the link between stock market efficiency and financial crises [5].

Financial Integration and Stock Market Efficiency

The majority of empirical studies examining the link between financial liberalization and market efficiency have also led to inconclusive and heterogeneous results. Indeed, proved that market deregulation has not affected several measures of informational efficiency (autocorrelation test, etc.). This result contradicts the hypothesis that emerging markets become more efficient after the official liberalization dates. Checked if the stock market of Amman became more efficient after the establishment of a liberalization process in 1997. They showed that financial liberalization did not improve the market performance. Concluded that changes in the liberalization process have positive and important implications in the level of the performance of the Greek stock market. Used a time-varying parameter model in order to study the gradual effects of liberalization process on the weak form efficiency of some emerging markets. They indicated that although the empirical results reveal a significant impact of liberalization on efficiency, the direction of these effects seems inconclusive because these results appear to be specific to each market. Showed, by analyzing the behaviour over time of the Hurst's exponent, that the liberalization measures and the Tunisian stock market reforms can be considered among factors that helped to reduce deviations from the informational market efficiency theory (weak form efficiency). Also, indicated that a formal harmonization of African stock markets and their integration with international markets can improve their informational efficiency. employing, on the one hand, the adjusted pricing error from a market model as a proxy for the financial integration and, on the other hand, the country- level price delay as an inverse measure of informational efficiency (the latter captures the speed of stock prices adjustment to common global information), they tried to find out if a more integrated stock market is associated with a higher degree of efficiency. Using data from 49 financial markets (22 developed markets and 27 emerging markets) and for the period 1995-2007, they found evidence supporting the hypothesis that the most integrated markets with the international market are also more efficient and the significant positive association between the two key variables (integration and efficiency) is found only in the subsample of emerging stock markets. showed that financial liberalization does not only improve the level of efficiency, but also reduces the probability of a crisis. In addition, they indicated that improving informational efficiency depends on the internal characteristics of each financial market. In another study, examined the impact of financial liberalization on the informational efficiency of 13 emerging economies. To this end, they estimated a time-varying parameter model for the period from January 1986 to December 2008. The results of their studies showed that markets become more efficient in recent years and also proved that the structural breaks detected in stock returns predictability coincide with the official liberalization dates and with their alternative events. Recently, tried to examine the causal relationships (in the Granger sens) between financial liberalization and informational efficiency, using a panel data covering 27 emerging markets over a period from 1996 to 2011. They showed that liberalization process has deteriorated effect on the informational efficiency of stock markets in the short term, but a long-term positive impact. Found that the effect of financial reforms (including financial liberalization and regulation) on informational efficiency is

insignificant. This may be due to the potential information asymmetry caused by liberalization. Indeed, foreign investors from those countries, which companies cross-listed on the domestic stock market may have information on these cross-listed firms that are not available to local investors. These two groups of investors can therefore, take different trade position, which may have an ambiguous effect on whether or not stock prices reflect fair value. Also, foreign investors can use their informational advantage to beat the market and make a profit. This could offset any improvements to financial markets efficiency, brought about by other aspects of liberalization.

Stock market efficiency and financial crises

Financial crises are not a new phenomenon, they are manifested by serious problems in the financial sphere. Indeed, indicates that crises occur when a major disorder in the financial markets, characterized by a sharp drop in securities prices and the failure of many financial and non-financial firms, causes a sharp increase in problems of adverse selection or « anti selection » and moral hazard. As a result, financial markets will be unable to efficiently channel savings to the most productive investment opportunities. In other words, they cause an increase in asymmetric information that prevents the efficient functioning of financial markets.

Therefore, the negative repercussions of the financial crises on the financial sphere and their recurring and repetitive nature (Asian crisis in 1997, Russian crisis in 1998, bursting of the Internet bubble in 2001, global financial crisis in 2008, the Greek crisis in 2011) prompted some researchers to provide evidence on the possible relationship between these crises and the financial market efficiency (indirect effect of crises on informational efficiency). For example, Lim, Brook and Kim (2008) studied the impact of Asian crisis on the informational efficiency of eight Asian stock markets, by employing the rolling bicorrelation test statistics for three subperiods (before the crisis, during the crisis and after the crisis). The results of their study, on the one hand, showed the presence of a non-linear serial dependence, which proves the existence of a deviation from the equilibrium (efficiency) resulting from the external shocks and on the other hand, indicated that the crisis affected the efficiency of most Asian stock markets, with Hong Kong being the most affected, followed by Philippines, Malaysia, Singapore, Thailand and Korea. However, most of these countries experienced an improvement in efficiency during the post-crisis period. Finally, Lim, Brook and Kim concluded that the empirical results confirming the presence of a high degree of inefficiency during the Asian crisis are not surprising since this period is characterized by a chaotic financial environment. Mishra (2009) tried to provide empirical evidence on the efficiency of the Indian stock market in the context of the recent global financial crisis. Using unit root tests, he showed the presence of evidence on the weak form of market inefficiency (negative effect of the global financial crisis on informational efficiency). showed the absence of an indirect effect between financial crises and informational efficiency (the financial market efficiency is independent of the multiplication of crises). showed that markets that are more integrated with the international market experienced a significant decline in stock prices during the global financial crisis and that this negative relationship

between stock market returns and the level of financial integration during the crisis period is evident only for emerging markets [6].

Definition of multidimensional variables

Before starting the estimation of the general model (1), you must first determine the empirical measurement of the two key variables mentioned above.

Empirical measure of price delay

The stock price delay measure popularized by and later used by assesses the relative speed of stock prices adjustment to common information from the US market. In other words, it measures the fraction of the variation in local market returns that is explained by the lagged US market return. Thus, the determination of the delay variable requires prior estimation of the unrestricted market model: Indeed, the R-squares from the two equations (the restricted and the unrestricted version of the market models) are used to calculate the following price delay measure: low), the greater variation in the domestic market index returns that is explained by the lagged US market returns. This indicates that the response speed of the domestic market to common information from the US market is low (high delay value). Thus, price delay is an inverse measure of informational efficiency, where a higher value of price delay indicates a low degree of efficiency and vice versa [7].

Empirical measure of integration

Indeed, the higher the value of integration measure (the integration value near zero), the greater the degree of financial integration between the local and the US market. In case of full integration the value of Integration is equal to zero, which confirms the validity of the law of one price (LOP). This law implies the equality between the stock market returns when these markets are perfectly integrated and the absence of arbitrage opportunities in the long-term equilibrium [8].

The control variables

The sources of the five control variables are: Investibility: is the ratio of the portfolio equity liabilities and the market capitalization (portfolio equity liabilities/market capitalization) [6]. This ratio named "degree of investibility" is a quantitative measure that determines the degree of availability of the domestic stock market to foreign investors. Its value varies between 0 and 1. If this ratio is equal to zero, in this case, the market is totally closed to foreign investors. But, if the ratio defined above is equal to one, in this case, the market is perfectly open to the outside [9].

Short selling: is a dummy variable which reflects the ability (legality and feasibility) of an investor to take a short position. It is equal to one if the short-selling or other put options trading are feasible in a given country and vice versa.

Size: the natural logarithm of market capitalization of listed companies is used as a "proxy" for the size of the financial market.

Volume: the natural logarithm of one plus the turnover ratio is used as a "proxy" for the trading volume (market capitalization of listed companies and the turnover ratio are extracted from World Bank's, World Development Indicators WDI (2012)).

Volatility: The relationship between stock market volatility and informational efficiency depends on whether the volatility is excessive or not. Indeed, the market is "informationally efficient" if the observed volatility changes within a reasonable margin and price differentials are low. This volatility is a reflection of the market activity justified by the fundamentals and results from a reaction to the new information. By cons, if volatility is excessive and price gaps are important, a significant portion of the transactions are not based on fundamentals, which put into question the efficient market hypothesis. Indeed, we use, like the GARCH family models and precisely the GARCH (1,1) specification. These models capture several features of stock return volatility in particular, the volatility clustering and the leverage effect.

Empirical Results

A- Analysis of the behaviour of financial integration and informational efficiency.

Before starting our empirical analysis, we will try in what follows to provide an initial idea on the spatial and temporal variation of the two key variables namely: "Integration" and "Delay".

Indeed, the cross-sectional variation of financial integration and informational efficiency [10], will be represented. The latter shows that the majority of developed markets are characterized by a higher degree of integration than their African counterparts. This proves that developed markets are more integrated with the US financial market (international benchmark). Also, the stocks price delay measure behaves in a similar way, 10 Data assembled by based on their investigations on some financial markets shows the variation of the average value of Integration and Delay, during the period from 2003 to 2012 and for each of the ten financial markets selected for the study. Supporting the finding that developed markets are more efficient and therefore, faster in incorporating new information into stock prices.

Conclusion

The aim of this article is to study the effects of liberalization reforms and market microstructure (liquidity, volatility, etc.) on informational efficiency, while taking into account the global economic crisis (2008, 2009).

The results obtained show several interesting facts. First, the financial integration is not the only factor that can improve informational efficiency. The latter must be associated with other factors such as the level of financial market development ("liquidity", "size"). Therefore, financial markets must attain a certain maturity in order to fully benefit from the process of financial liberalization. Second, the markets that are more integrated with the US market are also more efficient and this positive and significant association is also established in the two subgroups of developed and African emerging markets. By cons, this relationship loses its explanatory power during the period of financial crisis and during which African stock markets appear more volatile than their developed counterparts. These findings confirm the importance of the potential benefits of financial integration process for African emerging markets. So, it would be advantageous for African countries to liberalize their capital markets, which allows international investors to benefit from the advantages of financial integration such as risk sharing, reduction of stock market volatility, improving liquidity, efficiency and competitiveness of capital markets. Indeed, an investor who allocates a portion of its assets to emerging market helps to increase investment opportunities, to improve productivity and to enhance long-term economic growth.

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