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Does Economic Integration Affect the Co-movement between Financial Markets? Evidence from Pakistani equity market with its global partners

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ABSTRACT

The study investigates the impact of bilateral trade, economic fundamentals and financial crisis on the equity market integration (EMI) of Pakistan's equity market with its major global trading partners (China, India, USA and UK) for the period 1998 to 2016. The findings of the study indicate that bilateral trade and economic conditions have a significant impact on EMI, the export dependence of two economies may increase the EMI and import dependence reduces the EMI of two economies. Moreover, inflation differential and volatility in the bilateral exchange rate have a negative impact on EMI. It implies that inflation rates in Pakistan's equity market are higher as compare to other markets and volatility in bilateral exchange rate may reduce trade flows and its tendency to follow other market (Bracker, Docking , & Koch, 1999). Furthermore, the financial crisis in an economy may reduce the EMI with its trading partners and EMI between different markets is affected by their bilateral economic fundamentals. The results imply that financial integration between different markets is affected by their bilateral economic fundamentals. The study has strong implications for international investors who need to assess risks and benefits associated with international portfolio diversification.

Keywords
Bilateral trade; Bilateral economic conditions, Equity market integration; Developed markets, Regional markets

JEL Classification
F36, G11, G15

1. Introduction

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The integration between the capital markets is an important domain in financial economics that covers various facets of the interrelationship across equity markets. The current study is an attempt to explore the bilateral macroeconomic factors that explains the co-movement between different equity markets. In last couple of decades, the financial and economic linkages among various economies have increased and resulted in the synchronization among equity markets.

Numerous studies have explored EMI between different equity markets in a linear setting by using cointegration analysis and VAR framework. Most of the work in this domain has been done in the USA (Johnson & Soenen, 2002; Tai, 2007; Dimitriou & Simos , 2014) but in recent past the emerging markets have also grabbed the attention of the researchers due to their growing importance (Wang & Moore, 2008; Simpson, 2008; Karagoz & Ergun, 2010; Peir´o, 2016; Paramati et al., 2018). Although, recent work does not focus on determining the economic factors behind co-movement of equity markets and a few studies have been conducted to explore different macroeconomic forces that impact EMI of developed and emerging markets i.e. Robert and Soenen (2003) explore the impact of trading relations on co-movement between South American markets and the USA.

Existing studies attribute this growing EMI to the rise in financial integration between world economies but appear to ignore the presence of real economic integration. Financial integration covers markets within the same region or the existence of common attributes of the markets (Norén, 2011; Bouët et al., 2012; Peir´o, 2016; Thomas et al., 2017). On the other hand, economic integration specifically deals with bilateral economic ties and cross-border investment. Literature also cites some other reasons behind economic integration such as providing convenience to market participants, relaxing rules, technological advances, and removals of over regulations. These dynamics of the market contribute to increase EMI between economies, which, in turn, give rise to synchronization among the equity markets. Büttner and Hayo (2011) study the role of exchange rate risk in weakening the integration among equity markets in the European Union region. The degree of EMI and economic integration between two countries is generally revealed through the degree of equity market synchronization (Joyo & Lefen, 2019).

This particular study is an attempt to contribute to the second strand of literature by investigating the economic factors that influence EMI. The study focuses on Pakistan that is an emerging market and has been identified as one of the best performing markets during the current decade. The integration of the Pakistani market with the US and the UK is interesting from the historical trade and finance perspective. The US and the UK

have economic and social ties with Pakistan in areas ranging from education to energy, trade, and investment. The US is Pakistan's largest export destination country followed by the UK.

During the last decade, it has been observed that economic power is shifting towards China and India. It is noteworthy that both countries share the border with Pakistan. China has a long history of economic relations with Pakistan and has contributed significantly in infrastructure development. Statistics highlight some interesting facts regarding economic bonding with China. Imports from China have touched to the level of 28% of total cumulative imports of Pakistan. The role of China has further increased after China Pakistan Economic Corridor (CPEC hereafter) initiative, as more than $50 billion are allocated for energy and infrastructure related projects. These long-term projects are indicators of potential economic integration between the two countries.

India is becoming one of the major emerging market of the world. It is the largest economy of South Asia and a member of the South Asian Free Trade Area (SAFTA). However, it has a long history of political issues with Pakistan that dampens the opportunities for economic cooperation. Despite these adverse relationships with India, Pakistan's export to India has significantly increased from 2003 to $403 million in 2013 and then decreases to $312 million in 2015. On the flip side, imports have also increased from 2003 to 2013 from $184 million to $2.18 billion and reported at $1.96 billion in 2015. It is further added that informal trade between these counties is $ 4.71 billion. These global economic trend calls into question whether these markets are integrated with Pakistan or not.

Keeping in view the above scenario, it is imperative to unfold the causes and drivers of the integration of Pakistan's equity market with two global and two regional giants by using bilateral trade relations and economic fundamentals, such as inflation differentials, real interest rate differential, Δ bilateral exchange rate, variation in the exchange rate of these countries and GDP growth rate differential. The research on determinants of integration among the equity market has significant implications for the investors who want to seek portfolio diversification and for the policymakers and regulators who are keen to know about factors that may affect the national equity market and financial stability of the country (Chen, 2018).

It is hypothesized that exports dependence has positive impact on EMI whereas a negative impact of imports dependence is expected. The macroeconomic variables including inflation, real interest rate differential, and Δ bilateral exchange rate, Annual growth rate differential are expected to have negative impact on EMI. The financial

crisis is expected to decrease the integration between the markets and during the time of volatility, it may have a positive and negative impact on EMI.

The rest of the study is organized as under: Section II explains the literature on the integration of equity markets and its determinants, Section III covers the data description and methodology employed for analyzing the data, Section IV reports results of data analysis and Section V concludes the study and offers remarks for future research implications.

2. Review of Literature

Economic integration has long been debated over the past couple of decades in the context of trade creation and trade diversion. Integration among equity markets provides diversification opportunities for the investor to mitigate unsystematic risk. As the portfolio managers use global diversification strategy as a risk-hedging tool, therefore, international portfolio managers need to understand the behavior of the market such as co-movement, sensitivity, and exogenous shocks.

Economic theory suggests that there is an expectation of co-movement between different pairs of financial time-series in the long-run. The relationship between these series may not hold in the short run, but this deviation does not hold due to the market forces, government regulations and investor's preferences (Ghosh, Saidi, & Johnson, 1999; Dhanaraj, Gopalaswamy, & Babu, 2017; Ge, Wu, Zhang, & Zou, 2019). Numerous studies have documented the dynamic linkages between different equity markets and volatility transmission mechanisms based on such interdependence (Hasan, Saleem, & Abdullah, 2008; Abbas, Khan, & Shah, 2013; Fraz & Hasan, 2016; Paramati et al., 2018; Kim, Choi, & Kim, 2019).

Roll (1992) investigates the disparate behavior of the different equity market indices and report that some market indices are highly diversified as compared to the others. Bodurtha, Chinhyung and Senbet (1989) suggest that some macroeconomic factors are persistent and are the prime source of information, which leads co-variation among the returns of different financial time-series. Campbell and Hamao (1992) argue that degree of economic integration keeps on changing between any two pairs of countries and it is expected that the EMI between two markets may also change.

Bracker, Docking and Koch (1999) have reported that EMI between two markets may depend upon certain macroeconomic factors such as bilateral trade, bilateral exchange rate, bilateral GDP, etc. The characteristics of these macroeconomic variables may increase/decrease the degree of economic integration between these countries. Vithessonthi and Kumarasinghe (2016) argue that financial liberalization between two

countries provide an opportunity for local firms to borrow from the other countries and investors may invest in portfolios of the equities or import to the competing firms in another country. The study suggests that export-based economies can improve their bilateral export with other countries and their financial integration has a significant and positive relationship with international trade.

Johnson and Soenen (2002) have investigated whether the financial markets of American region are integrated with the US equity market. The study suggests that bilateral imports, bilateral exchange rate volatility are the important factors behind EMI. Yu, Fung and Tam (2010) explore the EMI of ten Asian markets by using high frequency indicators. The findings of the study document EMI between emerging and developed markets is not the same, due to the different attributes like institutional settings, economic and political factors across Asia. The study further implies that no such definition of financial integration is available, which is unanimously accepted in the literature.

Different studies have used correlations and global betas as a proxy of the financial integration between the markets (Morana & Beltratti, 2008; Wälti, 2011; Bekaert, Erb, & Harvey, 1997; Vo, 2018) and R^2 obtained from the asset-pricing model (Schotman & Zalewska, 2006; Pukthuanthong & Roll, 2009; Vithessonthi & Kumarasinghe, 2016). Pukthuanthong and Roll (2009) have suggested that the correlation between two equity markets is a weak indicator of financial integration. Even though the index of each of country has different responsiveness towards these factors, it may not reveal the same perfect correlation. Further states that the beta may vary due to leverage, level of production, industrial structure and representation of equity market.

EMI has been measured by using different measure, a lot of studies measures EMI by using asset pricing model's R^2as a proxy of equity price synchronicity (Morck, Yeung, & Yu, 2000; Dasgupta, Gan, & Gao, 2010; Vithessonthi & Kumarasinghe, 2016; Farooq, Ahmed, & Bouaddi , 2018). Vithessonthi and Kumarasinghe (2016) examine the effect of financial development and economic integration (by using international trade integration as a proxy) on EMI and employ the same R^2 approach based on a multifactor model of Pukthuanthong and Roll (2009) by using the sample of fifteen developed and developing countries of Asia. The findings suggest that financial development has a significant and positive relationship with EMI, whereas economic integration is not associated with bilateral EMI.

During the last two decades' globalization, cross border flows and economic interdependency reshaped the dynamics of integration among equity markets. Pakistani

market as observed significant changes in socio-political and economic front during this period. Therefore, it is need of the time to revisit the intensity of the integration along with other factors influencing the phenomena.

3. Research Methodology

This section discusses the framework for data analysis from data collection to sample framework and employed methodology for the analysis.

3.1 Data collection and sample description

The study employs monthly closing prices of equity market indices of Pakistan i.e., Pakistan stock exchange (PSX), China i.e., SSE Composite Index (SSE), India i.e., Bombay stock exchange (BSE), US i.e., Standard and Poor's 500 (S&P), UK i.e., Financial Times Stock Exchange (FTSE) 100 Index and MSCI global index. The data for this study ranging from June 1998 to June 2016 to test the EMI between Pakistan's equity market index along with MSCI global index with sample countries equity markets. However, data from 1998 to 2001 is consumed for the calculation of EMI.

The study takes into the account emerging regional markets of Pakistan, India and China and developed markets of the U.S. and the U.K. as sample countries. Prior to the partition, both India and Pakistan as sub-continent have remained colonies of the Great Britten. Even, after independence, both countries are linked with the U.K. in terms of trade. However, with the passage, of time the U.S. dominates Asian markets as a global leader due to the liberalization of the capital markets.

It is worthwhile to shed light on the increasing influence of China in the recent past due to its trade magnitude and announcements of different mega infrastructure project within the region. Due to the above-mentioned reasons, the sample for these countries has been selected to test the phenomenon that how the world developed markets and regional emerging markets have integrated with Pakistan's market. To examine the inter-linkages between PSX with each of the countries monthly index return is calculated as:

$$\text{Monthly index return} = \ln\left(\frac{P_t}{P_{t-1}}\right) \quad (1)$$

Where, ln is natural logarithm considers continuous compounding assumption, P_t is the closing index price at the end of the month t and P_{t-1} is the closing index price at the end of the montht-1.

The study uses two sets of economic determinants. First, potential economic determinants of international EMI are based on bilateral trade including exports and

imports contribution of the countries. Second, set of the variables is used to estimate the economic conditions inflation, real interest rate, GDP and exchange rate. The data of macroeconomic variables is obtained from the Comtrade, WDI and IFS database for the period of 2001 to 2016.

3.1.1 Variables description

3.1.1.1 Dependent variable

Multifactor model using R^2, the proxy of SPS is used as EMI and it is measured by using the capital asset pricing model. To estimate, EMI with other trading partners the degree of association is calculated by using the return of stock index of trading partner and MSCI global index with the return of Pakistan's stock index (An & Zhang, 2013; Vithessonthi & Kumarasinghe, 2016; Fraz & Hassan, 2017; Farooq, Ahmed, & Bouaddi, 2018).The study uses monthly market returns of Pakistan's equity market and MSCI global index with the returns of trading partners' equity market for36 months to estimate R^2 for each year from 1998 to 2016. The following model is used to estimate R^2.

$$R_{jt} = \alpha_0 + \beta_{it} R_{it} + \beta_{wt} R_{wt} + e_t \quad (2)$$

$R_{j,t}$ is the return of stock index of country *j* at time t, $R_{i,t}$ is the return of stock index of country *i* at time t, $R_{w,t}$ is return of MSCI global index *w* at time t and $e_{j,t}$ is the error term.

For bilateral financial integration of country *j* with each of the trading partner country,*i* is measured by using R^2 measure proposed by Vithessonthi and Kumarasinghe (2016)and the log transformation of this $R^2$is used in the second step to address the problem of boundedness of R^2.

$$SYNCH_{jit} = \ln\left(\frac{R^2_{jit}}{1-R^2_{jit}}\right) \quad (3)$$

R^2 in equation 3 is the R^2 estimated from the equation 2. This log transformation of the ratio of explained portion (of returns using market bilateral country return and world index return) versus unexplained variance component (of returns using market bilateral country return and world index return) of the returns.

3.1.1.1 Independent variable

As discussed earlier, the degree of EMI between two countries is dependent upon the nature of bilateral trade and different economic conditions. In the second step, the degree of association between EMI and economic fundamentals has been examined by using potential economic factors and their economic market conditions.

a) Measures of bilateral trade

The potential economic determinants of EMI are $EX_{ij}/EX_{i,}$ $EX_{ji}/EX_{j,}$ $IM_{ij}/IM_{i}$and IM_{ji}/IM_{j}. The first set of two proxies for bilateral trade is based on exports, EX_{ij} is the dependence of country *i* on country j as a potential export market. If the exports of country *i* have a higher portion of its total exports to country *j* (EX_{ij}/EX_{i}), in this case, the sensitivity of equity market of the country *i* should be higher to the movements in the equity market of the country *j* (Bracker, Docking , & Koch, 1999; Johnson & Soenen, 2002).It will lead to the prospects of higher or continuous export demand in the future and may have a positive relationship with the EMI. Similarly, the exports of country *j* to country *i* and a positive coefficient is predicted for EX*ji*/EX*j*.

The second set of two proxies for bilateral trade is based on imports, IM*ij* is the dependence of country *i* on country *j* for the imports. If the imports of country *i* have a greater portion of its total imports from country *j* (IM*ij*/IM*i*), then the equity market of the country *i* should be more concerned and it is expected that due to lower cost, consumers and producer of country *i* continue to import more goods from country *j* (Bracker, Docking , & Koch, 1999).

According to the future economic perspective of country *j*, the more demand of products by country *i* generates a signal for country *j* about the capacity of country *i's* buyers to carry on purchasing the import goods of country *j*. The larger dependency of country *i* imports from the country *j* lead to the EMI of country *i* and *j*. If the economy of the country *i* is going well and consumers of the country *i* obtain more goods from its trading partners. In that case, the economy and equity market of county *j* will perform well and the positive coefficient relationship between IM*ij*/IM*i* and EMI is expected (Johnson & Soenen, 2002).

At the same time, with the growing opportunities for exporting companies, it will be a great concern for country *i* that their exporting firms to compete with the exporting firms of country *j* in the international market. Therefore, the decrease in the IM*ij*/IM*i* will generate a signal for better future predictions for the exporting firms in country *i*, and country *i's* equity market may react adversely against the decrease in IM*ij*/IM*i* (Bracker, Docking , & Koch, 1999). Hence, the competing ability of country *i's* exporting firms with country *j's* firms might be inversely related due to the import dependence with country *j* (Johnson & Soenen, 2002). In the context of relative import dependence, both positive and negative coefficient is expected for IM*ij*/IM*i* and IM*ji*/IM*j* with EMI.

b) Measures of economic conditions that affect bilateral trade relationship

The second set of potential economic determinants are the measures of economic conditions that affect the bilateral trade, these include inflation differential, real interest rate differential, Δ bilateral exchange rate, volatility in the bilateral exchange rate and the difference in GDP growth rate. The first three variables i.e., inflation differential, real interest rate differential and Δ bilateral exchange rate are used to encompass the deviation from purchasing power parity (PPP) and interest rate parity (IRP).

Under the assumption of PPP, the relative changes between the inflation of two trading partners can be balanced by the changes in exchange rate. The inflation differential and Δ bilateral exchange rate between county *i* and country *j* are collectively representing the terms of trade, which shows the relative competitiveness of two economies. Therefore, these two variables inflation differential and percentage Δ bilateral exchange rate between county *i* and *j* characterize the possible deviation from PPP.

Likewise, the two variables, real interest rate differential and Δ bilateral exchange rate collectively represent the potential deviation from IRP. These deviations regarding PPP and IRP may have an effect on trade and capital flows of two countries and have an impact on the well beings of the firms in both countries (Bodurtha, Cho, & Senbet , 1989; Bracker, Docking , & Koch, 1999). The changes in the inflation rate differential, real interest rate differential and the bilateral exchange rates affect the trade flows and create a divergence in the co-movement between equity markets of country *i* and country *j*. Therefore, the negative relationship between inflation differential, real interest rate differential, Δ bilateral exchange rate and EMI is expected.

The volatility in the bilateral exchange rate is the fourth economic condition variable that influences the bilateral trade relationships. It measures the uncertainty in economic costs that are imposed on individuals and businesses in county *i* and country *j*. This uncertainty may reduce the economic and EMI between the two countries. Büttner and Hayo (2011) suggest that if two countries are in the same region then the bilateral exchange rate risk may have a negative impact on EMI. The study reports bilateral exchange rate volatility results in a decline in the EMI of regional markets and asymmetric effect of bilateral exchange rate volatility with other equity markets (Büttner & Hayo, 2011).

In this current study, two regional markets are taken from Asia and two developed markets International markets are taken for the analysis. Therefore, it is expected that there may be a positive or negative coefficient for the bilateral exchange rate. The difference in GDP growth rate of the two countries is intended to measure the growth

dynamics, it is expected that the relative GDP growth rate of one country might influence the economy of the other country. If the growth rate in the economy is due to the economic integration of the other country. On the flipside, faster-growing economies are more independent than large economies and may have less co-movement with other economies. Therefore, the negative relationship between annual growth rate GDP differential and EMI is expected.

During the last half of the previous decade, the Pakistani equity market has remained exposed to crashes and it has unprecedently reported three major downward movements during 2005, 2008 and 2010. During the mentioned period, a dramatic decline in the market is observed across a substantial cross-section of the equity market. These crashes are generally driven by fear and greed of the market participants. The Pakistani equity market has downed sharply in 2005 with the news of Inquiry against insider trading in various stocks.

In 2008, the Pakistani equity market has faced another worse crash when the panic sale of stocks hit the market. In order to control the collapse of the market, KSE management has taken the decision to freeze the market. This decision has created a panic and caused a steep fall in the market which resulted in a depreciation of 68% in the market index. The 'floor' remained in place for 108 days. The great crash of 2008 swept billions of rupees from the market. A similar episode is repeated in 2010 when average volumes decreased to 162 Million shares in the Pakistani equity market.

Chen, Chen and Lee (2014) examine the EMI among frontier and leading world equity markets before and after the global financial crisis. The study further investigates the impact of macroeconomic variables on EMI. The results indicate that the global financial crisis impacts the relationship between these markets and changes the macroeconomic determinantsof the EMI. Frijns, Tourani-Rad and Indriawan (2012) exmaine the EMI of 19 emerging equity markets including South Asia, East Asia, Latin America, Central Eupore and Eastern Europe in the presence of political crises around the world. The results suggest that during the period of 1991 to 2006 the crises reduce, the integration among these emerging markets.

The study of Wang, Yang and Bessler (2003) concludes that the degree of EMI of African markets with the US market decreases after the financial crisis. These market specific incidents affect the dynamics of integration across equity markets. The effect of the financial crisis may not be uniform. Its influence may differ from market to market, where as the integation attribution show decreasing trends after the crisis (Wu,

2020). This evidence shows that the crisis weakens the integration of markets, therefore, it is expected that EMI may decrease during the crisis.

3.2 Statistical modeling

The study has used panel data analysis using pooled OLS. The study employs two-step procedures to explore financial and economic integration. In first step degree of association between two markets has been examined by using R^2 procedure as reported above in equation 3. This reflects the co-movement between Pakistan's equity market with the trading partners' markets. In the second step, pooled OLS is employed to test the impact of economic fundamentals on EMI.

3.2.1 Econometric model for EMI and economic integration

The following equations are used to estimate the impact of bilateral trade and economic conditions on EMI:

$$\mathrm{SYNCH}_{ij,t} = \beta_0 + \beta_1\left(\frac{\mathrm{EX_{ij}}}{\mathrm{EX_i}}\right)_{ij,t} + \beta_2\left(\frac{\mathrm{EX_{ji}}}{\mathrm{EX_j}}\right)_{ij,t} + \beta_3\left(\frac{\mathrm{IM_{ij}}}{\mathrm{IM_i}}\right)_{ij,t} + \beta_4\left(\frac{\mathrm{IM_{ji}}}{\mathrm{IM_j}}\right)_{ij,t} + \beta_5\left(\mathrm{inf_i} - \mathrm{inf_j}\right)_{ij,t} + \beta_6\left(\mathrm{rir_i} - \mathrm{rir_j}\right)_{ij,t} + \beta_7(\Delta \mathrm{XR})_{ij,t} + \beta_8\sigma(\mathrm{XR})_{ij,t} + \beta_9\left(\mathrm{GDPGR_i} - \mathrm{GDPGR_j}\right)_{ij,t} + Crs_t + \delta_{ij,t} \quad (4)$$

Four different measures are used to determine bilateral trade, the first measure is based on exports i.e., EX_{ij}/EX_i at time t, which is exports from country *i* to country *j* divided by total exports of country *i* at time t. The second measure of bilateral trade is also based on exports and is measured as EX_{ji}/EX_j at time t, which are exports from country *j* to country *i* divided by total exports of country *j* at time t. The third measure is based on imports and it is measured as IM_{ij}/IM_i at time t, which is imports of country *I* from country *j* divided by total imports of country *i* at time t. The fourth measure of bilateral trade is also based on imports and it is measured as IM_{ji}/IM_j at time t, which are imports of country *j* from country *i* divided by total imports of country *j* at time t. The data of bilateral trade flow variables i.e. imports and exports are taken from the Comtrade database.

The second set of potential economic determinants of EMI is the economic conditions that influence the bilateral trade relationships. This study employs five variables to estimate the economic conditions of the bilateral trade. The first is variable is the inflation differential $(inf_i - inf_j)_t$, which is the inflation differential between country *i* and county *j* at time t. The second variable of economic conditions is the real interest rate differential $(rir_i - rir_j)_t$, which is the real interest rate differential between country *i* and county *j* at time t. The third variable of economic conditions is the difference in GDP growth rate $(GDPGR_i - GDPGR_j)_t$, which is an annual growth rate differential between country *i* and county *j* at time t. The fourth variable of economic conditions is

the average Δ bilateral exchange rate between country *i* and county *j* at time t using daily bilateral exchange rate data. The fifth variable of economic conditions is volatility in the bilateral exchange rate between country *i* and county *j* at time t using the standard deviation of daily bilateral exchange rate data. The last crs_t is the dummy used for the global financial crisis of 2005, 2008 and 2010.

4. Results and Discussion

This section reports the results of EMI and macroeconomic variables for the period 2001 to 2016. To check the behavior of the data, the statistical behavior of the data is given in Table 1. It reports first, second, third, fourth moment of variables, which are mean, median, standard deviation, skewness and kurtosis respectively along with the minimum and maximum values of all variables. The mean and median explain the average and central value of the data, while the standard deviation shows the dispersion. The maximum and minimum values report the range of the data and location of the data is reported through skewness and kurtosis.

Table 1: Descriptive Statistics of all variables for the period 2001-2016

	Mean	Standard Error	Median	Standard Deviation	Kurtosis	Skewness	Min	Max
R2	0.101	0.009	0.089	0.073	0.211	0.845	0.001	0.278
$Ln(R^2/1- R^2)$	-2.601	0.158	-2.326	1.266	4.032	-1.718	-7.348	-0.956
EX_{ij}/EX_i	0.003	0.000	0.002	0.002	0.532	1.148	0.001	0.009
EX_{ji}/EX_j	0.084	0.009	0.059	0.075	0.206	1.118	0.004	0.273
IM_{ij}/IM_i	0.001	0.000	0.002	0.001	-1.147	-0.072	0.001	0.002
IM_{ji}/IM_j	0.061	0.007	0.040	0.056	5.176	2.147	0.012	0.291
inf_i- inf_j	-0.049	0.006	-0.047	0.045	0.383	-0.822	-0.167	0.032
rir_i- rir_j	0.010	0.005	0.008	0.039	1.113	0.918	-0.051	0.127
ΔXR	0.000	0.000	0.000	0.000	0.100	0.249	0.000	0.001
σ(XR)	0.004	0.000	0.003	0.002	1.963	1.182	0.001	0.011
$GDPGR_i$- $GDPGR_j$	0.008	0.005	0.009	0.039	-0.478	0.084	-0.078	0.086

Note: * *Descriptive statistics is calculated for each variable from 2001 through 2016*

** *R^2 is bilateral R^2 of multifactor model using county i to country j along with MSCI world market index, $Ln(R^2/1-R^2)$ is log transformation of bilateral R^2, EX_{ij}/EX_i is exports from country i to country j divided total exports of country i, EX_{ji}/EX_j is exports from country j to country I divided by total exports of country j, IM_{ij}/IM_i is imports of country i from country j divided by total imports of country i, IM_{ji}/IM_j is imports of country j from country i divided by total imports of country j, inf_i- inf_j is inflation differential between country i and county j, rir_i- rir_j is real interest rate differential between country i and county j, ΔXR is average percentage change in bilateral exchange rate between country i and county j, σ(XR) is volatility in bilateral exchange rate between country i and county j and $GDPGR_i$- $GDPGR_j$ is the difference in GDP growth rate between country i and county j.*

Table 1 reports the descriptive statistics of all the variables. The average R^2 for EMI of Pakistan with trading partners' equity market is 0.101, which explains a 10.1% variation in overall markets over the sample period. The highest R^2 for any market is 0.278 and the lowest R^2 is 0.001 with a standard deviation of 0.073. The synchronization of international markets with the Pakistani market is low as the value of R^2 on average

is 10% whereas it touches a maximum level of 27%. It means that Pakistani market may have idiosyncratic factors that influence its alignment with global markets. The country-specific and firm-specific variables may contribute to the synchronization of different markets (Campbell, Lettau, Malkiel, & Xu, 2001).

Table 1 also shows that the export ratio of country *i* to country *j* divided by total exports of country *i* (EX_{ij}/EX_i) is 0.003 and the highest ratio is0.009 and the lowest ratio is 0.001 with a standard deviation of 0.002. The average ratio of exports from country *j* to country *i* divided by total exports of country *j* ***(***EX_{ji}/EX_j***)*** is 0.084, which is higher from the average (EX_{ij}/EX_i). That export ratio shows that the average exports from Pakistan to other sample countries are the higher and have highest ratio with any country in any year is 0.273 and the minimum ratio is .004 with a higher standard deviation of 0.075 as compared to the ratio (EX_{ij}/EX_i).

The results of the imports ratio show that the average import ratio of country *i* from country *j* divided total imports of country *i* (IM_{ij}/IM_i)is 0.001 and the highest ratio is 0.002 and the lowest ratio is 0.001 with a standard deviation of 0.001. The average ratio of imports from country *j* to country *I* divided by total imports of country *j* ***(***IM_{ji}/IM_j***)*** is 0.091, which is higher from average (IM_{ij}/IM_i). That import ratio shows that the average imports from the sample countries are higher and have the highest ratio with any country in any year is 0.291 and the minimum ratio is .021 with a higher standard deviation of 0.056 as compared to the ratio ***(***IM_{ji}/IM_j***)***.

The descriptive statistics for economic conditions are also reported in the above table. The inflation rate differential has an average value of -0.049, which shows that the average inflation in Pakistan as compared to the sample countries is higher in the sample period. Whereas, the real interest rate differential has a positive mean value of 0.010, which shows that the average real interest rate in Pakistan for the sample period is lower as compared to sample countries. Therefore, it is concluded that in recent past higher nominal interest rates in Pakistan are not due to the higher real interest rate but due to the high inflation rate. The average percentage of bilateral exchange ratio is .01%, with the highest value of .001 and has standard deviation of .0002.

The descriptive of volatility in bilateral exchange rate shows an average value of .004 with a highest value of .011 and the lowest value of .001 along with a standard deviation of .002. The positive value of the growth rate in GDP differential shows that Pakistan has a higher average growth rate in GDP during the sample period. Whereas, the highest and lowest value of the bilateral growth rate in GDP is observed 0.086 and -0.078, which shows in some years the GDP growth rate of sample countries is higher

as compared to Pakistan. Table 2 reports the bilateral R^2 of Pakistan and selected countries.

Table 2: R^2 between Pakistan and other markets 2001-2016

	2001	2002	2003	2004	2005	2006	2007	2008
China→ PK	0.003	0.036	0.09	0.015	0.052	0.122	0.186	0.107
India→PK	0.076	0.143	0.099	0.108	0.045	0.14	0.186	0.175
UK→PK	0.028	0.076	0.061	0.044	0.041	0.164	0.278	0.13
US→PK	0.088	0.04	0.078	0.055	0.037	0.141	0.206	0.069
	2009	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
China→ PK	0.016	0.023	0.046	0.271	0.111	0.073	0.001	0.099
India→PK	0.007	0.024	0.073	0.271	0.125	0.085	0.001	0.111
UK→PK	0.018	0.029	0.064	0.269	0.174	0.177	0.077	0.11
US→PK	0.114	0.145	0.134	0.27	0.182	0.107	0.023	0.109

Table 2 shows the value of R^2 for the period of 2001 to 2016 for sample countries. The bilateral R^2 is calculated each year and is used as a proxy of EMI. The results reveal that the bilateral EMI of the Pakistani equity market and the UK market is higher and the highest value of $R^2$0.278 is observed in 2007. Whereas, the lowest value of R^2 0.001 is observed with China and India in 2015. Historically, the EMI with Pakistan and trading partners is lower and all markets report the lowest value of R^2 in 2005 due to the hit of the first financial crisis in the Pakistani equity market. It is the period of three major crises in the Pakistani equity market and is evident of downward movements during 2005, 2008 and 2010 as shown in Fig. 1. After the first crisis, the revival of EMI is started and the second crisis of 2008 followed by the 2010 crisis results a decrease in the EMI. Figure 1 shows these variations of the degree of EMI from 2001 to 2016.

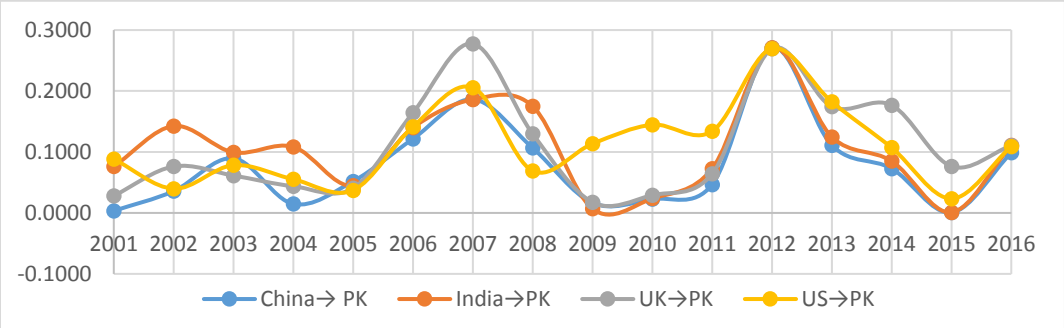

Fig 1: R^2 between Pakistan and other markets 2001-2016

The graphical representation is showing a decrease that after 2012 the EMI of the Pakistani market with other global partners. However, it is worth mentioning that after 2015 the integration with all trading partners is increasing. It can also observe from the

graph below that the degree of EMI of Pakistani equity market with its trading partners varies across countries over time.

Table 3: Impact of economic fundamentals on EMI from 2001 to 2016

Variable	β	S.E	t-	β	S.E	t-	β	S.E	t-Stat
	Model 1			Model 2			Model 3		
C	-1.43	0.83	-	-1.68	0.81	-	-2.08	0.54	-3.88
$\mathbf{EX}_{ij}/\mathbf{EX}_{i}$	126.92	119.9	1.06	206.10*	121.6	1.69	209.51*	107.3	1.95
$\mathbf{EX}_{ji}/\mathbf{EX}_{j}$	-0.89	3.37	-	-0.14	3.28	-			
$\mathbf{IM}_{ij}/\mathbf{IM}_{i}$	-236.22	402.7	-	-245.68	389.4	-			
$\mathbf{IM}_{ji}/\mathbf{IM}_{j}$	-7.82**	3.34	-	-9.63***	3.33	-	-9.52***	3.04	-3.13
$\mathbf{inf}_{i}$- $\mathbf{inf}_{j}$	-7.28*	4.28	-	-	5.22	-	-	4.86	-2.95
$\mathbf{rir}_{i}$- $\mathbf{rir}_{j}$	-5.40	5.82	-	-7.43	5.70	-	-6.44	5.12	-1.26
ΔXR	310.34	877.0	0.35	177.48	850.3	0.21			
σ(XR)	-	92.77	-	-	89.97	-	-	77.67	-3.45
GDPGR	-10.45	6.50	-	-9.07	6.32	-	-6.71	4.90	-1.37
Crisis				-1.05**	0.48	-	-1.07**	0.47	-2.28
Adj. R^2	0.12			0.18			0.21		
F-stat	1.95			2.35			13.46		
F- Sig	0.06			0.02			0.00		

Note:*(1) *** Significance at 0.01 level ** Significance at 0.05 level and * Significance at 0.10 level.*

(2) The table represents three models; Model 1 is based on the bilateral trade and economic fundamentals. Model 2 represents the impact of bilateral trade and economic fundamentals on EMI along with dummy of 2005, 2008 and 2010 Crisis observed in Pakistan. Model 3 is the final model represents the impact of bilateral trade and economic fundamentals on EMI along with the dummy of 2005, 2008 and 2010 Crisis observed in Pakistan by excluding the variables burden on the Model 2.

The table 3 reports the results of pooled regression of Model 1, Model 2 and Model 3 for the entire sample period. Model 1 explains 12% variation in EMI due to macroeconomic fundamentals and goodness of the fit statistics shows the attributes of bilateral trade and economic conditions significantly explains the variations in EMI.As earlier discussed that different types of the crisis which are associated to any market may influence differently to the markets. The Pakistani equity market has exposed to three crashes of 2005, 2008 and 2010. In the second model dummy of crisis for 2005, 2008 and 2010 has been introduced and it is observed that R^2 increases from 12% to 18%. The coefficient of crisis in Model 2 reports a significant value of -1.05, which indicates the crisis weakens the EMI of Pakistan with global equity markets.

Finally, the general to specific approach is used to extract a parsimonious model, therefore, the variables that are a burden on the model excluded. The parsimonious model is proposed as Model 3 that indicates 21% variation in EMI due to macroeconomic fundamentals. The explanatory power of Model 3 is higher than Model

1 and Model 2. Exports from country *i* (trading partner)to country *j* (Pakistan)as a percentage of total exports of trading partner (EX_{ij}/EX_i), imports of country *j* from country *i* as a percentage of total imports of country *j* (IM_{ji}/IM_j), inflation rate differential, volatility in bilateral exchange rate and Crisis in Pakistan show significant impact on EMI. All the variables have the expected signs of coefficients.

The bilateral trade proxy based on exports (EX_{ij}/EX_i) has a significant and positive impact on EMI. It indicates the dependence of trading partners' on the Pakistani market as a potential export market. If the portion of trading partners total exports to Pakistan increases the sensitivity of equity market co-movement should increase, it may lead to the increasing export demand in future (Bracker, Docking , & Koch, 1999).This relationship indicates that the dependence of the export of two countries can increase the EMI.

The bilateral trade proxy based on imports (IM_{ji}/IM_j) has a significant and negative impact on EMI. It shows that an increase in the portion of Pakistan's total imports with its trading partners will reduce EMI. Bracker, Docking and Koch (1999) argue that growing exporting opportunities for all the firms globally the firms of both country *i*, and country compete with each other in the international market as well as in-home countries. In such case these firms may be inversely related and have low EMI due to import dependence, which means import dependence of two countries can decrease the EMI.

The results of Model 3 report a significant and negative impact of inflation differential on EMI. The inflation differential between the two countries characterizes the possible deviation from PPP which affects the trade flows between two countries and represents the competitiveness of two economies (Bodurtha, Cho, & Senbet , 1989).The relative changes in the inflation difference affect the term of trade and result in the divergence between the co-movement of two economies. The results suggest that an increase in the inflation differential reduces the EMI. The volatility in bilateral exchange has a significant and negative impact on EMI. The volatility in the bilateral exchange rate captures the uncertainty in economic costs imposed on individuals and businesses (Büttner & Hayo, 2011). The results indicate that the increase in the uncertainty in economic cost will reduce the EMI between two markets.

The dummy of the financial market crisis of 2005, 2008 and 2010 in the Pakistani equity market has reported a significant and negative impact on EMI. It indicates that the market-specific incidents affect the dynamics of integration across equity markets (Frijns, Tourani-Rad, & Indriawan, 2012; Chen, Chen, & Lee, 2014; Mobarek,

Muradoglu, Mollah, & Hou, 2016).The negative sign of the financial crisis shows that the crisis weakens the integration of markets.

5. Conclusion

The study examines the impact of economic variables on EMI of Pakistani equity market with two developed market (the U.S. and the U.K.) and two regional emerging markets (India and China) for the period of 1998 to 2016. The study employs two-step procedures, in the first step the co-movement of equity markets is estimated by using the multifactor model, and in the second step the impact of economic variables on EMI is investigated. The high co-movement between two markets is considered a proxy of EMI (Vithessonthi & Kumarasinghe, 2016). The results of co-movement indicate that bilateral EMI of the Pakistani equity market and the UK market is higher as compared to the other countries and the highest value of R^2 0.278 is observed in 2007.In the second step, the study examines the impact of economic fundamentals on EMI. The results of this study show that bilateral trade and economic conditions have a significant impact on EMI. The findings of the study suggest that the export dependence of two economies may increase the EMI, whereas the import dependence may reduce the equity market dependence of two economies. Two variables of economic conditions inflation differential and volatility in the bilateral exchange rate have a negative impact on EMI. The higher share of import of a country along with high inflation differential and volatility in the bilateral exchange rate have a negative impact on equity market comovement (Bracker, Docking , & Koch, 1999). Further findings suggest the financial crisis in an economy may reduce the EMI with its trading partners. The study implies that the co-movement of two equity markets statistically depends upon bilateral trade, economic conditions and tend to change during the crisis period.

References

Abbas, Q., Khan, S., & Shah, S. A. (2013). Volatility transmission in regional Asian stock markets. *Emerging Markets Review, 16*, 66-77. doi:https://doi.org/10.1016/j.ememar.2013.04.004

An, H., & Zhang, T. (2013). Stock price synchronicity, crash risk, and institutional investors. *Journal of Corporate Finance, 21*, 1-15. doi:https://doi.org/10.1016/j.jcorpfin.2013.01.001

Beck, K. G., Finnerty, J. E., & Tucker, A. L. (1992). The Intraday Interdependence Structure Between U.S. And Japanese Equity Markets. *Journal of Financial Research, 15*, 27-37. doi:https://doi.org/10.1111/j.1475-6803.1992.tb00784.x

Bekaert, G., Erb, C. B., & Harvey, C. R. (1997). What matters for emerging equity market investments. *Emerging markets Quarterly, 2*, 17-46. Retrieved from https://faculty.fuqua.duke.edu/~charvey/Research/Published_Papers/P45_What_matters_for.pdf

Bodurtha, J. J., Cho, D. C., & Senbet , L. W. (1989). Economic Forces and the Stock Market: An International Perspective. *The Global Finance Journal, 1*, 21-46. Retrieved from https://pdfs.semanticscholar.org/cc8e/8cdf1e78f24e0c6fe3a3bfea218fa485c551.pdf

Bouët, A., Berisha-Krasniqia, V., Estradesa, C., & Labord, D. (2012). Trade and investment in Latin America and Asia: Perspectives from further integration. *Journal of Policy Modeling, 34*, 193-210. doi:https://doi.org/10.1016/j.jpolmod.2011.09.004

Bracker, K., Docking , D. S., & Koch, P. D. (1999). Economic determinants of evolution in international stock market integration. *Journal of Empirical Finance, 6*, 1-27. doi:https://doi.org/10.1016/S0927-5398(98)00007-3

Büttner, D., & Hayo, B. (2011). Determinants of European stock market integration. *Economic Systems, 35*, 574–585. doi:https://doi.org/10.1016/j.ecosys.2010.10.004

Campbell, J. Y., & Hamao, Y. (1992). Predictable Stock Returns in the United States and Japan: A Study of Long-Tern Capital Market Integration. *Journal of Finance, 47*, 43-69. doi:http://onlinelibrary.wiley.com/doi/10.1111/j.1540-6261.1992.tb03978.x/full

Campbell, J. Y., Lettau, M., Malkiel, B. G., & Xu, Y. (2001). Have individual stocks become more volatile? An empirical exploration of idiosyncratic risk. *The Journal of Finance, 56*, 1-43. doi:http://onlinelibrary.wiley.com/doi/10.1111/j.1540-6261.1992.tb03978.x/full

Chen, M.-P., Chen, P.-F., & Lee, C.-C. (2014). Frontier stock market integration and the global financial crisis. *The North American Journal of Economics and Finance, 29*, 84-103. doi:https://doi.org/10.1016/j.najef.2014.05.004

Chen, P. (2018). Understanding international stock market comovements: A comparison of developed and emerging markets. *International Review of*

Economics & Finance, 56, Chen, P. (2018). Understanding international stock market comovements: A comparison of developed and emerging markets. International Review of Economics & Finance, 56, 451-464. doi:https://doi.org/10.1016/j.iref.2017.12.004

Dasgupta, S., Gan, J., & Gao, N. (2010). Transparency, Price Informativeness, and Stock Return Synchronicity: Theory and Evidence. *Journal of Financial and Quantitative Analysis, 45,* 1189–1220. doi:https://doi.org/10.1017/S0022109010000505

Dhanaraj, S., Gopalaswamy, A. K., & Babu, M. S. (2017). Trade, Financial Flows and Stock market interdependence: evidence from Asian markets. *Empirical Economics Review, 7,* 15-34.

Dimitriou, D. I., & Simos , T. M. (2014). Contagion effects on stock and FX markets: a DCC analysis among USA and EMU. *Studies in Economics and Finance, 31*(3), 246-254. doi:DOI: https://doi.org/10.1108/SEF-07-2012-0075

Farooq, O., Ahmed, N., & Bouaddi , M. (2018). Stock price synchronicity and its effect on stock market volatility: evidence from the MENA region. *American Journal of Finance and Accounting, 5*(3), 276-292. doi:https://doi.org/10.1504/AJFA.2018.093042

Fraz, A., & Hasan, A. (2016). Dragon's Entry in South Asia and its Impact on Financial Market. *The Pakistan Development Review*(Special Issue), 445-454.

Fraz, A., & Hassan, A. (2017). Stock Price Synchronicity and Information Environment. *Business & Economic Review, 9*(4), 213-232. doi:DOI: dx.doi.org/10.22547/BER/9.4.10

Frijns, B., Tourani-Rad, A., & Indriawan, I. (2012). Political crises and the stock market integration of emerging markets. *Journal of Banking & Finance, 36,* 644-653. doi:https://doi.org/10.1016/j.jbankfin.2011.05.007

Ge, Y., Wu, J., Zhang, J., & Zou, L. (2019). The role of Chinese economic variables on Australian and New Zealand equity returns. *Accounting & Finance, 59*(5), 3053-3103. doi:https://doi.org/10.1111/acfi.12573

Ghosh, A., Saidi, R., & Johnson, K. H. (1999). Who Moves the Asia-Pacific Stock Markets-US or Japan? Empirical Evidence Based on the Theory of Cointegration. *The Financial Review, 34,* 159-170. doi:https://doi.org/10.1111/j.1540-6288.1999.tb00450.x

Hasan, A., Saleem, H., & Abdullah, M. S. (2008). Long-run relationships between an emerging equity market and equity markets of the developed world an empirical analysis of Karachi stock exchange. *International Research Journal of Finance and Economics*, 52-62. Retrieved from https://www.researchgate.net/publication/239849976

Johnson, R., & Soenen, L. (2002). Asian economic integration and stock market comovement. *Journal of Financial Research, 25*, 141-157. doi:https://doi.org/10.1111/1475-6803.00009

Joyo , A. S., & Lefen, L. (2019). Stock Market Integration of Pakistan with Its Trading Partners: A Multivariate DCC-GARCH Model Approac. *Sustainability, 11*(2), 303. doi:doi:10.3390/su11020303

Karagoz, K., & Ergun, S. (2010). Stock market integration among Balkan countries. *MIBES Transactions, 4*, 49-59. Retrieved from http://mtol.teithessaly.gr/vol4_2010/Karagoz-Ergun.pdf

Kim, S.-W., Choi, M. J., & Kim, Y.-M. (2019). Does Intra-Regional Trade Matter in Regional Stock Markets?: New Evidence from Asia-Pacific Region. *Asian Economic Journal, 33*(3), 253-280. doi:https://doi.org/10.1111/asej.12186

Kim, Y. H. (2005). The optimal path of regional economic integration between asymmetric countries in the North East Asia. *Journal of Policy Modeling, 27*, 673-687. doi:https://doi.org/10.1016/j.jpolmod.2005.05.004

Mobarek, A., Muradoglu, G., Mollah, S., & Hou, A. J. (2016). Determinants of time varying co-movements among international stock markets during crisis and non-crisis periods. *Journal of Financial Stability, 24*, 1-11. doi:https://doi.org/10.1016/j.jfs.2016.03.003

Morana , C., & Beltratti, A. (2008). Comovements in International Stock Markets. *Journal of International Financial Markets, Institutions and Money, 18*, 31-45. doi:https://doi.org/10.1016/j.intfin.2006.05.001

Morck, R., Yeung, B., & Yu, W. (2000). The information content of stock markets: why do emerging markets have synchronous stock price movements? *Journal of Financial Economics, 58*, 215-260. doi:https://doi.org/10.1016/S0304-405X(00)00071-4

Norén, R. (2011). Towards a more integrated, symmetric and viable EMU. *Journal of policy modeling, 33,* 821-830. doi:https://doi.org/10.1016/j.jpolmod.2011.08.003

Paramati, S. R., Zakari, A., Jalle, M., Kale, S., & Begari, P. (2018). The dynamic impact of bilateral trade linkages on stock market correlations of Australia and China. *Applied Economics Letters, 25*(3), 141-145. doi:https://doi.org/10.1080/13504851.2017.1305067

Peir´o, A. (2016). Stock prices and macroeconomic factors: Some European evidence. *International Review of Economics and Finance, 41*, 287-294. doi:https://doi.org/10.1016/j.iref.2015.08.004

Pukthuanthong, K., & Roll, R. (2009). Global Market Integration: An Alternative Measure and Its Application. *Journal of Financial Economics, 94*, 214-232. doi:https://doi.org/10.1016/j.jfineco.2008.12.004

Robert, J., & Soenen, L. (2003). Economic integration and stock market comovement in the Americas. *Journal of Multinational Financial Management, 13*, 85-100. doi:https://doi.org/10.1016/S1042-444X(02)00035-X

Roll, R. (1992). Industrial Structure and the Comparative Behavior of International Stock Market Indices. *The Journal Of Finance, 47*, 3-43. doi:https://doi.org/10.1111/j.1540-6261.1992.tb03977.x

Schotman , P. C., & Zalewska, A. (2006). Non-synchronous trading and testing for market integration in Central European emerging markets. *Journal of Empirical Finance, 13,* 462–494. doi:https://doi.org/10.1016/j.jempfin.2006.04.002

Simpson, J. L. (2008). Financial integration in the GCC stock markets: evidence from the early 2000s development phase. *Journal of Economic Cooperation*, 1-28. doi:https://dx.doi.org/10.2139/ssrn.994706

Tai, C. S. (2007). Market integration and contagion: Evidence from Asian emerging stock and foreign exchange markets. *Emerging markets review, 8*, 264-283. doi:https://doi.org/10.1016/j.ememar.2006.09.011

Thomas, N. M., Kashiramka, S., & Yadav, S. S. (2017). Dynamic linkages among developed, emerging and frontier capital markets of Asia-Pacific region. *Journal of Advances in Management Research, 14*(3), 332-351. doi:DOI: https://doi.org/10.1108/JAMR-10-2016-0088

Vithessonthi, C., & Kumarasinghe, S. (2016). Financial development, international trade integration, and stock market integration: Evidence from Asia. *Journal of Multinational Financial Management, 35*, 79-92. doi:https://doi.org/10.1016/j.mulfin.2016.03.001

Vo, X. V. (2018). Trade integration and international financial integration: Evidence from Asia. *The Singapore Economic Review*, 1-12. doi:https://doi.org/10.1142/S0217590818500248

Wälti, S. (2011). Stock market synchronization and monetary integration. *Journal of International Money and Finance, 30*, 96–110. doi:https://doi.org/10.1016/j.jimonfin.2010.07.004

Wang, P., & Moore, T. (2008). Stock Market Integration for the Transition Economies: Time-varying conditional correlation approach. *The Manchester School, 76*, 116-133. doi:https://doi.org/10.1111/j.1467-9957.2008.01083.x

Wang, Z., Yang, J., & Bessler, D. (2003). Financial crisis and African stock market integration. *Applied Economics Letters, 10*, 527-533. doi:https://doi.org/10.1080/1350485032000100198

Wu, F. (2020). Stock market integration in East and Southeast Asia: The role of global factors. *International Review of Financial Analysis, 67*, 1-11. doi:https://doi.org/10.1016/j.irfa.2019.101416

Yu, I. W., Fung, K. P., & Tam, C. S. (2010). Assessing financial market integration in Asia – Equity markets. *Journal of Banking & Finance, 34*, 2874–2885. doi:https://doi.org/10.1016/j.jbankfin.2010.02.010