WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Case Study In Financial Economics

MOHD ALYAS S/O Mohd Bashir

Alyasmughal856@gmail.com

ABSTRACT :

Making financial decisions is not always a straightforward process. Time, risk (uncertainty), opportunity costs, and information can create incentives or disincentives. Financial economics employs economic theory to evaluate how certain things impact decision making, providing investors with the instruments to make the right calls.Financial economics usually involves the creation of sophisticated models to test the variables affecting a particular decision. Often, these models assume that individuals or institutions making decisions act rationally, though this is not necessarily the case. The irrational behavior of parties has to be taken into account in financial economics as a potential risk factor.

Keywords:-Globalization-Impact-Dominate-Estimator-Decision

Introduction :

Financial contagion is defined as the spread of shock from a region, an economy, or a market to other regions, economies, or markets. Contagion is an imminent result of global financial integration. While increasing global financial integration is perceived as a measure of improving economic efficiency and development, contagion is often perceived as a potential risk that can cause detrimental excess volatility in the economy and the financial systems of integrated countries. The concept of contagion can be elucidated from the viewpoint of the four agents that influence financial globalization, specifically the governments, the financial institutions, the investors, and the debtors (Schmukler, 2004). This thesis addresses international stock market contagion from the outlook of individual investors in the aftermath of the Global Financial Crisis of 2007-09. The world is still grappling with the impact of the Global Financial Crisis that happened a decade back, questioning the stability of the global financial markets. (Dewandaru, et al., 2014). The global financial system is highly integrated making it vulnerable to shocks. A shock often affects a small group of financial institutions to start with, but quickly proliferates to other financial institutions and market segments in an economy and due to contagion quickly affects the global financial system (Allen & Gale, 2000). Hence, most often we see that shocks that start in one market or country may affect two other unrelated market segments or countries even though it did not originate in either of them. The burgeoning recurrence of several small and large financial shocks and periodic crises in international financial markets with its swift spillovers to other global markets make an investigation of the impact of contagion on global financial markets a topic of paramount significance (Kenourgios, et al., 2016). 2 Studies on cross-market linkages started gaining intensified research attention with the Mexican peso crash of 1994, the Tequila effect of 1995, the Asian Financial Crisis of 1997- 1998, the 1998 Russian collapse, and the 1999 Brazilian devaluation (Sruthi & Shijin, 2017). The Global Financial Crisis has rekindled the importance of studies on contagion in financial research (Caccioli et al., 2014). Literature is divided on the definition of contagion with Dornbusch, Park & Claessens (2000), Forbes (2012), Pericoli, & Sbracia (2003) together listing nineteen different definitions of it. See chapter 2 for further discussion on this topic. Similar to multiple definitions of contagion, multiple empirical methodologies are used in the literature to study contagion. Methods ranging from GARCH family models (Bonga-Bonga, 2018 ; Dungey, et al., 2015 ; Celik, 2012; Edwards & Rigobon, 2009), methods based on Vector Auto Regression models (Samarakoon, 2011 ; Le & David, 2014), copula based approaches (Boako & Alagidede, 2017; Changqing, et al.,2015 ; Philippas & Siriopoulos, 2013 ; Zorgati, et al., 2019) to conditional correlation or conditional probabilities (Kaminsky & Reinhart, 2000) and dynamic conditional correlation framework (Akhtaruzzaman, et al., 2019 ; Chittedi, 2015 ; Cho & Parhizgari, 2009) are in use. Global financial markets demonstrate higher interdependence over time as a natural consequence of trade and financial linkages and global capital flows (Sewraj et al., 2018). While higher market integration is perceived as an indicator of developed markets, contagion is perceived as a test to the stability of international financial markets (Dewandaru et al., 2013). In the event of a shock, contagion also ensues as a ramification of panic responses with no change in fundamentals (Eichengreen et al., 1996). However, it is difficult to extract fundamental based interdependence and pure contagion and models that attempt to do so use macroeconomic variables like exchange rate, interest rate, volume of trade, liquidity, proxies for banking performance and linkages (Baur, 2012). Barring exchange rate, macroeconomic variables are not available at the same frequency as stock market prices. Thus, only low frequency data can be used in such studies. Domestic macroeconomic factors like inflation, interest rate, balance of payments, government debt, political stability and investor sentiments are echoed in a country's exchange rate. A country's exchange rate is closely associated with its other macroeconomic variables and hence influences and is influenced by these variables (Ramasamy & Abar, 2015). Exchange rates are thus included in our model as a proxy for a country's relative macroeconomic position that influences investor returns. Impact In the context of this thesis, we use the working definition of contagion following Forbes and Rigobon (2002) and Guo et al. (2011). Contagion is defined as a significant excess comovement of markets following an

economic shock to one or more of the financial market(s). This working definition is suitable to be used even with high frequency data and to develop test-statistics to detect contagion without having to identify and specify the source of the shock or the channels of its propagation. From an international investor's perspective, this practical definition would give insights on whether it makes sense to construct international portfolios in the wake of shocks to the global financial system (You & Daigler, 2010a).

Investor Perspectives :

Contagion is a widely researched area. The literature on contagion is vast and diverse with respect to the definition of contagion, the predictability of its occurrence, the measurement of contagion, the impacts of contagion and the channels through which contagion spreads. With a plethora of work already been done in this hugely researched area, it is pretty startling that not much theoretical or empirical consideration was given to the very elementary questionthe question of selecting the appropriate currency unit to express the asset returns (Mink, 2015). While some studies acknowledge that the currency effects on asset returns and contagion are important, these currency effects are often not considered in the modelling exercise by way of specifying the exclusion as an assumption and by leaving it as a topic for further research (Allen & Gale, 2000). Undertaking a currency risk has a potential return incentive (Tai, 2007) and hence including currency effects is recommended in a study of international investments. Most studies on international portfolio and contagion effects use US Dollar denominated asset returns in their analysis by convention. Certain studies contend that the usage of US Dollars or conversion of returns to US Dollars is to represent a global investor (Corsetti et al., 2005). The usage of US Dollar as a numeraire facilitates comparison across portfolios and helps attain country neutrality (Rouwenhorst, 1999). This excessive focus on US Dollar returns makes such empirical results true and applicable only for an American (US) investor (Levy & Sarnat, 1970). Some studies base their analysis only on US Dollar denominated returns (Forbes & Rigobon, 2002; Markwat et al., 2009; Baele & Inghelbrecht, 2010; Bua & Trecroci, 2019) for the 4 complete empirical examination. Some studies on contagion on the other hand, use local currency returns initially in the main empirical analysis, and then make use of US Dollar denominated returns, or vice versa, to bring all returns to a common currency both for the purpose of comparison and as a means to undertake robustness checks (Akhtaruzzaman, 2019 ; Lee & Kim, 1993). Undoubtedly, the perspectives of other country investors are typically overlooked and under-researched (You & Daigler, 2010a) in literature. Later studies on contagion and international stock market diversification are increasingly using local currency denominated returns. The idea behind using local returns is to place emphasis on correlation between markets and not between currencies (Longin & Solnik, 1995). Investigating the literature, we find a couple of explanations on why studies on international stock market diversification do not typically consider currency exchange rate effects. One, the benefits to international diversification are beyond what can be ascribed to currency effects and in most cases currency exchange rate returns are uncorrelated to index returns denominated in local currency. Thus, currency returns do not significantly alter the results (Heston & Rouwenhorst, 1994). Two, currency risks can be hedged (Mink, 2015). Three, by convention currency effects are ignored in previous studies and so this is often cited as a limitation or simply ignored in succeeding studies (You & Daigler, 2010a). However, this approach has its own flaws. Payoffs from international investments to two investors given a country pair are different as they are exposed to different currency conversions and fluctuations (Mink, 2015). Therefore, whether we use US Dollar denominated returns for both investors for the sake of comparison or use local currency returns to eliminate currency effects, there is a naive underlying implied assumption that they receive the same payoffs from an international stock portfolio of two countries. An international investor can neither assimilate nor compare the returns received from an international portfolio when returns are represented in two different currency units. It is imperative that international investors encounter currency exchange rates while assimilating their total returns. This raises a fundamental question of using local currency returns and traditional comovement based tests on them to detect contagion as experienced by actual investors in these countries. While studies that use US Dollar denominated returns take care of realisable returns and actual contagion impact to US investors, neither local currency returns nor US Dollar returns represent the realisable returns from the perspective of 5 investors from other countries. This thesis is thus an attempt to bridge that gap by bringing in the perspectives of other country investors to study.

Motivation and key contributions :

Studies on excess comovements and contagion focus either on local returns or on US Dollar returns. In both the above cases, realisable returns to actual investors and the possibility of asymmetric impact of contagion on investors in two countries holding the same portfolio of international assets is not distinctively specified. This comparison is often reduced only to a robustness exercise. Thus, this thesis aims to propose a three-angle framework where local returns as well as realisable returns from the perspective of each investor is distinctively specified and studied under the same framework. It is important to study these investor perspectives and the objective market perspective under one framework to understand the comovement and contagion between markets and at the same time identify and enable comparison on how it affects investors in the two countries. Our framework uses actual estimates based on observed prices as well as a robust version constructed on bootstrapped estimates based on an approximated distribution of the observed data. The empirical examination of three developed-developing country pairs show that post the Global Financial Crisis of 2007-09, it is still profitable for developing country investors to invest in an international portfolio of own country (developing stock market) and a developed country stock market. However, developed country investors see an upward push in interdependence of their domestic market with developing markets due to contagion caused by the Global Financial Crisis of 2007-09, thus making it less attractive to them to invest in such a portfolio. Analysis based on a static treatment of data assumes that population parameters remain constant over the full sample period and misses the effect of time aggregation. To capture the dynamics of data over various durations of time and to allow parameters to vary over each time period, we employ an evolving analysis using dynamic rolling window analysis (Padmakumari & Maheswaran, 2017). We hold the parameters constant for every k = 1, 2, 3, 6, 9, and 12 months to filter out noise and observe the long-term trends in data. We find from our empirical analysis that investors with an outlook for varying time horizons are impacted differently. We observe excess comovements at higher lags of than lower lags of 6 implying that a long-term investor faces the heat of contagion more than a short-term investor. We also empirically test the rolling window correlation framework on investors in different country pairs spanning 10 developed - developed, 10 developed - developing and developing - developing country pairs. Of these above mentioned country

pair categories, numerous studies have been conducted on the first two country pairs but very little research attention is given to contagion between developing- developing country pairs. This study thus attempts to fill that gap. We did not find any discernible patterns for developed or developing country investors when empirically tested in an evolving framework. We find that for some country pairs, excepting a spike in interdependence due to contagion caused by the crisis, there is no observed long-term shift in interdependence. However, for some country pairs, the effect of contagion persisted into the post-crisis period leading to a shift towards higher interdependence. Lastly, we attempt to create an extreme value based correlation estimator that is unbiased to the closing price estimator and can perform as a test statistic in our framework. This way information advantage of extreme prices can be captured. Extreme value estimators based on open, high, low and close prices are more efficient than closing price estimators. However, it is difficult to arrive at combinations of price series, the correlation of which captures the true comovement between markets and one that reflects the impact on investors. Moreover, the area of extreme value correlations is not much explored in literature and is limited to a few studies on range-based estimation of correlation coefficients. We propose an extreme value correlation estimator model, which is free from rigid distributional assumptions. The model that we propose follows random walk data generating process making the framework simpler and generalizable.

Objectives :

This paper intends to propose a new three-angle correlation framework to detect shifts in cross market comovements and contagion and to identify the differential impact of realized contagion on actual investors in two countries. By this, we test the effect of currency exchange rate returns on investor's realized returns and realized contagion. We start with a 7 simple two-country and two-investor base model .we build upon this base model and examine the time-varying nature of correlations and its implication for realized contagion and portfolio diversification for investors with different investment time horizons. Further,EZ we attempt to develop an unbiased extreme value-based correlation framework as an extension for our base framework that is free of underlying distributional assumptions. Having discussed the objectives of the thesis concisely in the above paragraph, the specific objectives are:

- To develop a framework that examines the differential impact of currency effects on correlation estimates in different markets
- To test the effect of contagion due to Global Financial Crisis of 2007-09 and to compare the correlations during the various stages of business cycle on various developeddeveloped, developed-developing and developing-developing country pairs.
- To develop an extreme value correlation estimator free of rigid distributional assumptions that can be used as a test statistic in our three-angle framework. To test whether the incorporation of extreme values alter the observation of excess comovements in stock portfolios as observed using closing price estimator.

An extreme value approach to contagion – new test statistic :

The most commonly used comovement estimators use closing price information. However, extreme values like high and low prices in combination with open and close prices contain more information regarding the price process than just the closing price series (Chou et al., 2010). It started with point based estimation using open and close prices and then incorporating high and low prices as well to take into account extreme values in estimation. We call the class of estimators using open, high, low and close prices as OHLC estimators or extreme value estimators. We do not have many OHLC based comovement measures in literature and the ones that we have come with various restrictive assumptions. Parkinson (1980) and Garman and Klass (1980) were pioneers in the usage of OHLC prices for developing an estimator for volatility estimation. Both their results suggest that volatility estimators based on extreme values are more efficient in comparison to volatility estimators that are based solely on close prices. The Parkinson (1980) volatility estimator and the Garman and Klass (1980) volatility estimator come with an assumption of Brownian motion with zero drift (Jiang et al., 2014). Yang and Zhang, (2000) improves upon the earlier two models by considering the case of Brownian motion with drift. Kunitomo (1992) also proposed an extension to the Parkinson(1980) method by including drift terms that are not zero in Geometric Brownian motion. Rogers and Satchell (1991) proposed an unbiased estimator that works for Brownian motion with or without the drift and provides a correctionfactor to use with Brownian motion with drift to account for errors in the approximation of extreme values. Other popular range based volatility estimators are provided by Alizadeh et al., (2002), and Brandt and Jones(2006). Buescu et al., (2013) proposed a range based volatility estimator using the method of moments to find the expectation of the range of an arithmetic Brownian motion using daily OHLC price returns. The estimator is efficient for a small dataset but the efficiency falls as sample points increases. Liao and Anderson (2019) makes use of the first high, low and last prices in an intraday setting to develop a covariance estimator that is easy to compute from the variances of the individual stock prices and the portfolio variance . Their study also uses the correction factor proposed by Bannouh et al., (2009) to correct for microstructure issues in a high frequency setting. Range based volatility estimators are higher on efficiency, robust to market microstructure noise and approximates to a normal distribution (Alizadeh et al., 2002). Range based estimators are also lower on standard deviation and work as better proxies for volatility in comparison to closing price return based estimators of volatility (Jiang et al., 2014). There is however, a lack of consensus on the choice of one range based volatility estimator as the best estimator. In a study of seven emerging markets, Arneric et al., (2018) overcomes this problem of the choice of best volatility estimator by assigning the most suitable volatility estimator for each market that was studied. Considering the fact that most range based volatility estimators are similar in information content, it could possibly be beneficial to combine several such estimators rather than choosing one over the other (Kawakatsu, 2020). However, one important limitation of these range based volatility estimators is that they are derived with an underlying assumption of Geometric Brownian motion price process and stable volatility. Range based estimation of volatility paved way to range based estimation of covariances. A multivariate extension to the univariate range based volatility estimation was imperative considering the fact that multivariate interactions are the core of concern for international finance literature. Brunetti and Lildholdt (2002) extended the literature to a multivariate case by proposing a new estimator called co-range as a proxy for range based covariance. They also propose a range correlation but the values do not fall within the range of -1 and +1and so not easy to interpret.

Brandt and Diebold (2006) estimates range based covariances from

Data :

this utilises open, high and low prices data. The sample period is similar to ranges from January 1996 to December 2018. We have used weekly open, high and low data for stock index prices and currency exchange rates that are sourced from the Bloomberg database. The data is subdivided into pre-crisis period (01 January 1996 to 30 November 2007), crisis period (01 December 2007 to 30 June 2009) and post-crisis period (01 July 2009 to 31 December 2018) defined using the NBER's recommendations for Global Financial Crisis dates as followed in Chapter 3. The price data are transformed into logarithmic returns as per equation. In this paper we apply the proposed extreme value correlation estimator to two international portfolios that depicted stark differences in investor perspectives in the previous chapter. One of these is a developed-developing country pair (US and India) and the other is a developed-developed country pair (UK and US). The same data and procedure as in chapter 3 is used as we would like to see if the results would vary when the extreme value correlation estimator is used in place of the close-by-close correlation estimator used

BIBLIOGRAPHY :

1. Abken, P. A., & Shrikhande, M. M. (1997). The role of currency derivatives in internationally diversified portfolios. Economic Review-Federal Reserve Bank of Atlanta, 82(3), 34.
2. Acharya, V. V., & Yorulmazer, T. (2008). Information contagion and bank herding. Journal of money, credit and Banking, 40(1), 215-231.
3. Adrian, T., & Shin, H. S. (2010). The Changing Nature of Financial Intermediation and the Financial Crisis of 2007–2009. Annual Review of Economics, 2, 603-618.
4. Akhtaruzzaman, M., Abdel-Qader, W., Hammami, H., & Shams, S. (2019). Is China a source of financial contagion?. Finance Research Letters, 38(2021). 101393.
5. Akinsomi, O., Coskun, Y., Gil-Alana, L. A., & Yaya, O. S. (2018). Is there convergence between the BRICS and International REIT Markets? (No. 88756). University Library of Munich, Germany.
6. Alemayehu, D., & Doksum, K. (1990). Using the bootstrap in correlation analysis, with application to a longitudinal data set. Journal of Applied Statistics, 17(3), 357-368.
7. Alizadeh, S., Brandt, M. W., & Diebold, F. X. (2002). Range-based estimation of stochastic volatility models. The Journal of Finance, 57(3), 1047-1091. Allen, F., & Gale, D. (2000).
8. Financial contagion. Journal of political economy, 108(1),1-33. Aloui, R., Aïssa, M. S. B., & Nguyen, D. K. (2011). Global financial crisis, extreme interdependences, and contagion effects: The role of economic structure?. Journal of Banking & Finance, 35(1), 130-141.