**A bibliometric review of financial market integration literature**

**Abstract**

We undertake a meta-literature review on the topic of financial market integration (FMI), covering 260 articles from 1981–2021. Our review consists of quantitative analysis of bibliometric citations concomitant with qualitative analysis of content, towards a goal of identifying primary research streams and proposing directions for future research. We identify five research groups: (1) portfolio diversification with financial market integration; (2) general equity market integration; (3) financial market linkage with respect to crises and events; (4) time-varying financial market integration; and (5) co-movements and spillovers between commodities and financial markets; as well as present a wide array of future research directions. We conduct an extensive review of FMI literature, answering several questions: (1) What is the domain of FMI research?; (2) What are the influential aspects of top journals and authors, and the characteristics of the most studied topics?; (3) What are the past and current key research streams in FMI literature?; and (4) What are the substantial future relevant research questions to explore regarding FMI? Given the ongoing attention on financial market integration by both academicians and policy makers, our results should be of great interest.

**JEL classification:** G11, G12, G15, G20

**Keywords:** Financial market integration; Bibliometric citation analysis; Meta-analysis; Literature review; Content analysis; Portfolio diversification; Co-movement; Spillovers; Linkages

**1. Introduction and motivation**

The state where financial markets in different countries move together and show the same expected risk-adjusted returns is known as financial market integration (FMI) (Patel, 2019). Financial market integration continues to be emphasized in academic finance, particularly because of its relevance to portfolio diversification. Weak or low market integration produces risk diversification benefits for investors (Bekaert, Hodrick, and Zhang; 2009; Ibrahim, 2005; Patel 2019). According to (Click and Plummer, 2005) with respect to markets not yet fully integrated, to get better risk-return trade-off, investors can allocate funds to the most productive market, or region, or diversify by allocating across diverse regions. However, as countries globalize, forming, for instance, regional and international trade associations, markets become more integrated (Chowdhury, 2005), with deprecation of diversification benefits. Certainly, nations that conduct more international trade exhibit higher market integration (Patel, 2017).

A focus on market integration by finance academics stems from the early 1970s, with researchers (e.g., Grubel, 1968, Subrahmanyam, 1975; Kenen, 1976) identifying the existence of financial market integration and concomitant mitigation of investor diversification benefits. Along with these investigations, another research tract emerged examining changes in financial market integration. For instance, Vos (1988) evidences increases in financial market integration. Other studies identify time-varying integration among markets (e.g., Bekaert and Harvey, 1995). Related to these investigations of time variation, researchers (Bekaert, Hodrick, and Zhang; 2009**;** Huyghebaert and Wang, 2010; Yu et al., 2010) focus on examining changes in market integration with respect to financial crises and other ‘triggers.’

In the last several decades, while there have been a considerable number of significant FMI studies, focusing on various domains, there have been few studies assessing this research. Consequently, in line with the models of Alon et al. (2018), Øyna and Alon (2018), and Zott et al. (2011), we contribute by conducting a more extensive review of FMI literature, with a goal of answering several questions: (1) What is the domain of FMI research?; (2) What are the influential aspects of top journals and authors, and the characteristics of the most studied topics?; (3) What are the past and current key research streams in FMI literature?; and (4) What are the substantial future relevant research questions to explore regarding FMI?

We conduct a meta-literature review of FMI literature published between January 1981 and April 2021, applying a methodology that combines bibliometric citation and content analyses (Alon et al., 2018). Our study is based on meta-literature review, which differs from regression-based meta-analyses (Bessler, Conlon, & Huan, 2019; Białkowski & Perera, 2019; Fernau & Hirsch, 2017; Geyer-Klingeberg, Hang, & Rathgeber, 2019; Papadamou, Kyriazis, & Tzeremes, 2019; Pérez-Calero, Hurtado-González, & López-Iturriaga, 2019). In the social sciences generally, applying bibliometric citation analysis is a burgeoning technique for reviewing past studies. While, more specifically in the finance domain, review papers are often based on conventional surveys on specific topics and issues (Ballester, Díaz-Mendoza, & González-Urteaga, 2019; Corbet, Lucey, Urquhart, & Yarovaya, 2019; Deku, Kara, & Zhou, 2019; French & Vigne, 2019; Garner, Humphrey, Kearney & Liu, 2014; Nguyen & Boateng, 2015; Sensoy & Omole, 2018), very recently other papers apply bibliometric analysis. For instance, Helbing, (2019) explores the literature on IPOs by applying bibliometric citation techniques in order to identify the relationship among citations, authors, countries, and themes, while Paltrinieri et al. (2019) conduct a meta-literature review to assess literature on *sukuk*.

We apply a meta-literature review to 260 FMI articles in top journals, outlining the influential aspects of top journals, authors, as well as identifying influential and trending topics, and key research streams. We investigate several questions: (1) What is the domain of FMI research?; (2) What are the influential aspects of top journals and authors, and the characteristics of the most studied topics?; (3) What are the past and current key research streams in FMI literature?; and (4) What are the substantial future relevant research questions to explore regarding FMI?

We also identify five research groups: (1) portfolio diversification with financial market integration; (2) general equity market integration; (3) financial market linkage with respect to crises and events; (4) time-varying financial market integration; and (5) co-movements and spillovers between commodities and financial markets; as well as present a wide array of future research directions. Given the ongoing attention on financial market integration by both academicians and policy makers, our results should be of great interest.

**2. Methodology**

To extract knowledge from multi-faceted research studies, a meta-analysis of a vast body of literature should be conducted (Glass, 1976). Glass (1976) defines meta-analysis as “the analysis of analysis.” The present study is undertaken by conducting a meta-literature review, wherein we use both quantitative and qualitative techniques such as bibliometric citation and content analysis (Fetscherin et al., 2010). These methods are now used over a widespread range of approaches to performing meta-analysis in the fields of management, business, and finance research (Zamore et al., 2018).

Bibliometric analysis, first introduced by Bradford (1934), has considerably evolved. Price (1965) presents bibliometric methods to evaluate and map scholarly articles based on numbers of citations (Kim and McMillan, 2008), using articles as a basic unit of analysis (Alon et al., 2018) Content analysis is widely used in literature reviews and case studies (Bahoo, & Ayub, 2019; Bahoo et al., 2018). According to Potter & Levine-Donnerstein, (1999). Content analysis is a social science methodology to systematically review and confirm the validity of knowledge in a specific field of research. An outline of the methodology used in this paper is presented in Figure 1.

(Insert Figure 1 here)

***2.1 Sample Selection Process***

As shown in Figure 1, the sample selection process consists of three steps. The first step regards the selection of databases and the extraction of papers from these databases. In this study, we identify papers based on searches of the Scopus database. *Scopus* is widely used in bibliometric studies due to its having, compared with *Web of Science*, more extensive coverage over peer-reviewed articles from 1970 (Ball and Tunger, 2006; Fahimnia*et al.,* 2015; Feng et al.,2017, Mishra et al., 2018). As noted by Vieira and Gomes (2009), *Scopus* is particularly comprehensive as it covers many publications houses and the fields of study.

We identify papers based on the keywords, ‘financial market integration,’ ‘equity market integration,’ ‘financial market linkages,’ ‘stock market integration,’ and ‘stock market co-movement,’ appearing in article titles, abstracts, and keywords. Search results for these five keywords leads to an initial sample of 5,228 articles. As the selection of the keywords is very important, to ensure that we cover the entire body of literature on FMI, we conduct cartographic analysis through the *VOSviewer* software program to confirm that our keywords include the entire spectrum of the literature. *VOSviewer* receives bibliometric data as input and outputs the most repeated keywords in each research stream (see Figure 4). It is found that among all five streams. ‘Financial integration’ is the most representative and repeated keyword. The sample selection process, the search technique, and the identification of the keywords through the cartographic analysis are outlined in Table 1.

(Insert Table 1 here)

The second step relates to identifying irrelevant articles to exclude from the initial sample. To do this, we filter based on journals listed on the 2018 *Academic Journal Guide* of the Chartered Association of Business Schools (ABS) ranking. Journals not included in the ABS list are removed. After this filtering, the number of articles in our sample is reduced to 3,749. To get better quality papers, articles are further filtered to the restriction of the respective journal having an ABS 3 or above rating. This filtering process reduces the number of articles to 820. We further filter by applying the Zott et al. (2011) criteria that any article we engage with, discuss, examine, or analyze has FMI as its direct content. This process is conducted by two independent authors. Our final selection, after these filtering, consists of 260 articles.

2.2 Meta-Literature Review

Our meta-literature analysis consists of quantitative analysis of bibliometric citations and qualitative content analyses. For bibliometric citation analysis, we follow Liu et al. (2005), Apriliyanti and Alon (2017), Fetscherin and Heinrich (2015), Zamore et al. (2018) and Paltrinieri et al. (2019) by conducting the following analyses: (1) co-citation analysis, (2) co-authorships and (3) cartographic analyses. We use the *VOSviewer* software. *VOSviewer* takes article details as an input and outputs various details. *VOSviewer* utilizes distance-based mapping techniques to visualize items. As compared to *Cite Space* and *Sci2*, *VOSviewer* is considered a more powerful tool (Van Eck & Waltman, 2014). *VOSviewer* identifies networks and clusters in different forms and colors based on citation data. These clusters are based on assessing of links, including the strength of links among the sample articles (Van Eck & Waltman, 2014). The following subsections elaborate on our analysis procedures.

2.2.1 Stage 1: Identification of the influential aspects of FMI literature

The most studied countries (Table 2) are found from content analysis, whereas we apply *Vosviewer* to identifying the most influential journals (Table 3), authors (Table 4), and articles and topics (Tables 5 and 6). Initial analysis shows that 260 papers were published in 44 journals, authored by 508 scholars. These 260 papers have a total of 13,465 citations and investigate 150 world stock markets along with various other indices, sectors and commodities.

(Insert Table 2 here)

(Insert Table 3 here)

(Insert Table 4 here)

(Insert Table 5 here)

(Insert Table 6 here)

2.2.2 Stage 2: Co-Citation analysis

The commonalities and research streams in the literature are identified through bibliometric co-citation analysis. Co-citation means that articles cite each other, typically because they belong to the same concept or topic (Kim & McMillan, 2008). Co-citation analysis is performed using *VOSviewer*. *VOSviewer* receives bibliometric data as input and provides the output in different colors. Results of co-citation analysis are presented in Figure 2.

(Insert Figure 2here)

2.2.3 Stage 3: Co-authorship analysis

Using *VOSviewer*, we also conduct co-authorship analysis on the authors who are working on FMI (Liu et al., 2005; Piette & Ross, 1992). *VOSviewer* accepts bibliometric data as an input and provides co-citations, co-authorships, and cartographic analysis, leading to a picture of the social network of researchers in FMI. Results of this co-authorship analysis are illustrated in Figure 3.

(Please insert Figure 3 here)

2.2.4 Stage 4: Cartographic analysis

Keywords corresponding to streams of research are discovered by conducting cartographic analysis with *VOSviewer* (Van Eck & Waltman, 2010; Zamore et al., 2018). As keywords represent content areas, articles with the same keywords are clustered together in a cartographic analysis (Ding et al., 2001). Results of cartography analysis are reported in Figure 4. Keywords are selected based on a minimum occurrence of three times.

As a matter of course, cartographic analysis will also confirm the initial selection of keywords used to identify our selection of articles, with ‘financial market integration,’ ‘equity market integration,’ ‘financial market linkages,’ and ‘stock market co-movement’ being the most commonly occurring keywords in our sample. However, this analysis extends past this to identify keywords under each research stream. We use a minimum scale of co-occurrence of three for respective keywords.

(Please insert Figure 4 here)

2.2.5 Stage 5: Content analysis

According to Potter & Levine-Donnerstein, (1999), the purpose of content analysis is to explore, verify, and organize the research streams identified through bibliometric co-citation analysis. By applying content analysis on our sample of 260 articles, we explore the origins, concepts, classifications, and current streams of FMI literature.

3. Influential aspects of the financial market integration literature

3.1 Most and least studied countries (markets)

The most- and least-studied countries are identified based on content analysis. It is important to identify the most- and least-studied markets, as the most-studied markets will have greater influence on research conclusions, whereas the least-studied markets can be a focus of future studies. Consequently, to explore the linkage among the markets and portfolio diversification opportunities, it is important to study the most- and least-studied countries. The list of the 20 most- and least-studied countries is presented in Table 2. As can been seen in Table 2, The 260 sample papers examine 150 countries. The initial studies have focused mainly on developed markets but later on the focus shift on emerging markets. The frontier markets were least considered in the past studies.

In addition to financial markets, FMI papers also consider indices and commodities. Studies also examine various stock-market index categories as US (MSCI-US), emerging (MSCI-EM), frontier (MSCI-FM), World (MSCI WORLD), and various regional focuses (Reboredo, 2018; Cagliesi and Guidi, 2021).Commodities examined include aluminum, beverages, cocoa, coffee, copper, corn, cotton, diamond, energy, feeder cattle, gasoil, gold, heating oil, live cattle, natural gas, nickel, oil, platinum, precious metals, silver, soybeans, tea, unleaded gasoline, wheat and zinc are also considered by the studies to examine the integration among financial markets and commodity markets.

3.2 Influential journals and authors

We identify influential journals and authors using *VOSviewer*. We identify 10 leading journals based on total papers, number of citations, and number of citations per year. Top journals are listed in Table 3. These journals are *International Review of Financial Analysis*, *Journal of Banking and Finance*, *Journal of International Money and Finance*, *Journal of International Financial Markets, Institutions and Money*, and *Journal of Empirical Finance, Energy economics, International journal of finance and economics, Economics letters, European journal of finance, Journal of business finance and accounting*. These journals have published highest papers on the financial market integration during the 1981-2021.

We determine the most influential authors, based number of papers, number of citations, and average citations per paper. The top authors are reported in Table 4. According to Van Eck & Waltman, (2014), the list of top journals and top authors will be helpful to the future researchers to collaborate and publish their work.

3.3 Influential and trending articles and topics

We identify influential and trending articles using *VOSviewer*. Influential and trending articles are identified based on two criteria: 1) total citations and 2) citations per year. Identifying influential and trending articles assists future authors considering differing directions for research (Bahoo et al. 2020). We particularly identify 11 articles, as listed in Table 5. The articles are the top cited articles in the domain with highest citations and per year citation.

4. Citation mapping and visualization of the FMI literature

4.1 Co-Citation mapping and visualization

We conduct co-citation analysis using *VOSviewer*. *VOSviewer* receives bibliometric data as input and provides output in different colors. We choose to perform co-citation analysis considering a minimum of 20 citations. As shown in Figure 2, the output is shown in five colors: red (portfolio diversification with financial market integration); blue (equity market integration in general); green (financial market linkage with respect to crisis, event, and formation of association); yellow (time varying financial market integration); and violet (co-movement among the oil, stock, real estate, as well as commodity, bond, and crypto currency markets). In this study, b**y** ‘commodity,’ we mean all commodity markets other than oil, as we have chosen to consider the oil markets as particularly distinct from other commodities due to their wide spread importance and geopolitical influence (Corbet, Goodell, Gunay, 2020).Hence, we consider five main research streams in the literature.

In the second step, we conduct a detailed content analysis of 48 identified articles that are highly linked with each other. We do this to identify, explain and confirm their links with each other. This leads to identifying five major research streams in the literature. (1) portfolio diversification with financial market integration; (2) general equity market integration; (3) financial market linkage with respect to crises and events; (4) time-varying financial market integration; and (5) co-movements and spillovers between commodities and financial markets.

4.2 Co-authorship visualization

We also explore, again with the aid of *VOSviewer,* the co-authorship network among researchers working investigating financial market integration. Such co-authorship analysis is valuable as it identifies those researchers who are working on topics within financial market integration. This co-authorship visualization is illustrated in Figure 3. The minimum scale for this analysis is three co-authored papers with 130 citations. Figure 4 shows the cartography analysis generated by *VOSviewer*.

5. Review of the research streams in the FMI literature

5.1 Equity market integration in general

This research stream examines market integration under general conditions, focusing on cross-listing based integration, lead markets, portfolio diversification opportunities, new approaches and methods to measure integration, and the factors that affect market integration. Factors impacting financial integration examined in the literature include credit quality, inflation and inflation variability, interest rates, exchange rate controls, the presence (or lack) of high-quality regulatory and accounting frameworks, and levels of stock-markets development (Bekaert, 1995, Bracker et al., 1999, Johnson and Soenen, 2002).

Wu (2019) finds that the governments in East and Southeast Asia region have successfully facilitated financial market integration, as evidenced by ASEAN5+4 stock markets having high levels of financial market integration. In support of this, Qiao et al. (2008) evidence that the relaxation of government restrictions with subsequent adoption of liberal economic policies increases market integration.

Studies investigating factors engender integration find that co-movement among markets normally occurs because of trade, along with correlations of economic cycles and other global factors (e.g., Wang and Guo, 2019; Wu, 2019). Devereux and Yu (2019) evidence that the opening of the financial markets increases the financial market integration. Studies examining market integration have considered various areas. Masih and Masih (2001) evidence a leading role of the US and UK markets to other Asian markets. Lane and Milesi-Ferretti (2007) find that industrialized countries are ahead of developing countries in terms of the scale of cross-border asset trade, with consequently greater integration.

Other important papers discuss the stochastic nature of changes to integration. According to Akbari et al. (2021) integration is a gradual process not driven by cyclical or transitory processes. Patra and Panda (2021) find increasing integration of emerging markets with developed markets. Asgharian et al., (2013) find that geographically closed markets become more integrated with each other.

Other papers examine the impact of integration on investor propensity to rebalance portfolios. Kim and Lee (2020) find that investors in highly integrated markets manifest a greater propensity to rebalance portfolios. Others look at the impact of cross listings on integration, finding that equity cross-listings increases integration by motivating foreign direct investment and cross-border mergers (Howe and Madura, 1990; Varela and Lee, 1993; Hupperets and Menkveld, 2002; Lok and Kalev, 2006). However, Werner and Kleidon (1996) evidence that the cross-listing of stocks does not always increases the market Integration.

Other papers find that equity-market integration conditions how shock spillovers are impacted by both bilateral economic factors and cultural factors (Balli et al*.*, 2015), applying methodologies such as correlation‐based network, analysis of network structures and approach advance models, VAR-BEKK framework to examines the integration and shift in market dependence (Tong et al*.*, 2018; Chowdhury et al., 2019; Ben Saïda et al., 2018; Patra and Panda, 2021).Kim et al. (2005) highlight decreased diversification opportunities with the increase in integration following the introduction of the EMU. Beine et al. (2010) evidence increased co-movement resulting from global integration. Other studies investigating the role of integration with portfolio diversification opportunities include Cheng et al. (2010); Dicle and Levendis (2011); Harkmann (2020); and Patra and Panda, (2021). Akdogan (1992) notes that market integration leads to high level of systematic risk. While the role of financial market integration on portfolio diversification has been broadly covered, the dynamics of how market integration stochastic changes impacts opportunities for diversification has further exploration possibilities.

5.2 Financial market linkage with respect to crisis, extraordinary events, and formations of associations

The research stream investigating on the effect of crises, extraordinary events, and formations of associations on the financial market integration has received considerable attention. Studies find that integration among the equity market increases during andafter financial crises (Bekaert Hodrick ZhangDoukas, 1993; Meric et al*,* 2001; Aggarwal and Kyaw, 2005; Caporale *et al.,* 2005; Dimitriou et al*.*, 2013; Wang, 2014; Sewraj et al., 2018; Patel, 2019; Ben Saïda and Litimi, 2020). Such studies include finding that equity market integration increases with the Euro membership announcements (Bartram et al*.*, 2007; Bekaert et al*.*, 2013; Fratzscher, 2002).

Further, as a consequence of integration, the shocks are transmitted to other markets (Arshanapalli and Doukas, 1993). According to Rughoo and You (2015), integration between money and bond markets also increases post-financial crises. As compared to regional crises, global financial crises have greater impact on the financial market integration (Dias et al., 2019). This increasing integration, of course, leads to decreases in global portfolio diversification opportunities (Fratzscher, 2002; Sewraj et al*.*, 2018)

Some studies focus on markets integration with respect to introduction of the Euro, and responses to terrorist attacks and political crises. Javed and Virk (2017) evidence increases in equity market integration post introductions of the Euro. Chesney et al., 2011 find that terrorist attacks negatively impact market integration, leading to a greater role for alternative investments to establish portfolio diversification.

The portfolio decision is sensitive to the domestic terrorism risk. The fear of terrorism is important factor for making international portfolio investment (Narayan *et al*., 2018).The financial liberalisation does positive impact on the stock market comovement (Beine and Candelon, 2011, Huang *et al.,* 2021). The political crises and related features does significant negative impact on the market integration (Frijns *et al.,* 2012).

Finally, the researchers have explored and analyzed the Financial market integration with respect to crisis, event and formation of association by applying various techniques and models. However, still the studies can be perform to explore the domain focusing on various events and crisis. The past studies have explored Financial market integration in this domain but the portfolio diversification benefits are still unexplored, which can be future research avenue.

5.3 Time varying financial market integration

The articles on the time-varying financial market integration constitute limited studies in the literature. These article focuse on various sub-domains such as time-varying integration at regional and global level, integration with respect to crisis, EMU launch, Integration among oil and financial markets, portfolio diversification with integration etc.

Past studies find that the bond, oil and equity markets hold time-varying limited integration. Additionally, the markets of transition economies hold partial time-varying integration with each other (Rockinger and Urga, 2001). Jong and Roon (2005) assert that emerging markets in Europe, Mideast and Africa are affected by the segmentation of the respective country itself. The Asia and East region markets does not hold time-varying integration, reveals that the time-varying integration does not holds at regional levels for the Asia and east region markets (Jong and Roon, 2005).

Berger and Pozzi (2013) find that developed markets have time-varying integration with the World market, suggesting market integration has dynamic variability. Financial markets development and financial policies influences the financial market integration (Carrieri *et al.*, 2007). The stock market liberalisation engenders time-varying integration in emerging markets, as well as interdependence among stock and bond market returns (Panchenko and Wu, 2009). Batten *et al.*, (2019) find that the Asian Energy and Stock Markets holds both weak and strong Time-varying integration during first and second periods of the study.

Studies examining time-varying integration with respect to crises events find mix outcomes. Market indices manifest changing levels of integration as well as contagion effects during global financial crises. Markets evidence time-varying integration at cross-national and sub national levels, with such integration impacted by the regional and global financial crises (Cho et al., 2015). Lee and Kim (2020) find that time-varying integration among EU markets increased as a result of monetary similarities. Further, the GIIPS (Greece, Ireland, Italy, Portugal and Spain) crisis of 2010-2011 and EMU launch also increased the integration. On the other hand, Baele and Inghelbrecht (2010) evidence that financial crises and terrorist attacks does not have much impact on the integration.

Studies also examine the diversification benefits of time-varying integration. With increased integration and globalization, the benefits of the geographic portfolio diversification have decreased. Nevertheless, geographical diversification still is identified as having larger risk reduction benefits than industry diversification (Baele and Inghelbrecht, 2009).

Jong and Roon (2005) find that the time-varying integration among markets results in lower expected returns, with lower costs of capital. They also highlight the impact of crises, terrorist attacks, as well as regional and economic association formations on the market integration, along with concomitant portfolio diversification opportunities.

5.4 Co-movement among the Oil, stock , real estate, Commodity, bond markets and crypto currency markets

The fourth identified research stream in the literature is Comovement among the Oil, stock, real estate, commodity, bond markets and crypto currency markets. This stream entails papers pertaining to the integration of stock markets with the Oil, real estate, commodity and bond markets. The real estate market holds integration with bond and stock markets (Glascock *et al*., 2000; Liow, 2012). The Oil and stock returns holds relationship with each other (Ciner, 2013; Gil-Alana and Yaya, 2014). Ghosh and Kanjilal (2016) found that the oil and stock markets does not holds any relationship. However, after the global financial crisis, the oil and stock markets become integrated. In a study, (Ftiti *et al*., 2015) found that the stock markets are also affected by global oil price shocks. According to Kim *et al.* (2006), the bond markets can holds within strong and weak integration. But due to Integration, the long-term shocks are transmitted among currency and bond markets (Gravelle *et al.* 2006).

Studies also investigate oil-equity integration with respect to financial crises, and outbreaks of global conflicts (Corbet *et al.,* 2020). Integration among the equity and commodity markets increased after the global financial crisis 2008 (Delatte and Lopez, 2013; Jiang and Yoon, 2020; Ghosh and Kanjilal, 2016). Studies also find that war and terrorist attacks impact the integration of oil and stock prices (Kollias et al.,2013). The oil demand shocks based crisis influences the oil-stock markets integration (Ftiti *et al*., 2015).

There are very few studies on the integration among the crypto currency markets. According to Ji *et al.* (2019), the cryptocurrency markets are partially integrated with each other. Bitcoin and Litecoin and the most influential one for the volatility spillover and co-movements. The integration among the crypto currency markets is the least explored domain and hence in future more studies should be undertaken to get more from this area. Overall, as co-movements among the oil, stock, real estate, commodity, bond markets and cryptocurrency markets is studied in limited context, more research is required in this domain.

5.5 Portfolio diversification considering financial market integration

The ‘portfolio diversification considering financial market integration’ is fifth research stream we identify. Levels of financial market integration naturally impact portfolio diversification opportunities and benefits (Gupta et al., 2012; Elfakhani et al., 2008; Grahama and Nikkinen, 2011). This extends to investigations of bond markets integration with stock, and energy and commodity markets (Reboredo, 2018). Other studies investigate integration at the regional level, (Lee, 2017; Billio et al., 2016); as well as whether frontier markets are integrated with world markets or offer portfolio diversification benefits (Berger et al., 2011). Cagliesi and Guidi (2021) find that due to lack of strong integration, emerging and frontier markets provide diversification benefits. Brooks and Negro (2004) and Meric and Meric (1989) find that county-based portfolio diversification results in greater risk reduction as compared to the diversification across industries within countries. Vermeulen (2013) posits that investors should actively rebalance their portfolios towards low correlation during the financial crises. Patel (2021) finds that when the markets hold weak or no integration, investors should diversify their funds to other markets. Boako et al. (2020) finds that during crises home-bias in portfolios comes at greater cost. D’Ecclesia & Costantini, 2006 find that common-cycle components diminish the benefits of diversification. There is still a need to conduct further research to explore the portfolio diversification benefits. We summarize the key papers in Table 6.

6. Identifying FMI research streams with cartographic analysis

It is important to investigate the growth of the various research streams of financial market integration. We used cartographic analysis to identify the keywords in each stream and to indicate the growth of various research streams (Apriliyanti & Alon, 2017). These results are presented Table 1. These keywords are used to examines the growth of studies in each research streams. The growth of all the five streams is presented in Figure 5.

(Please insert Figure 5 here)

**7. Future research Questions**

7.1 Equity market integration in general

There is no consensus regarding the levels of market integration among developed, emerging and frontier markets. Consequently, there are opportunities for scholars to further assess integration among financial markets of developed, emerging and frontier countries, focusing on groups of countries from either similar or different geographical areas or countries comprising economic-regional and trade associations, such as ASEAN, SAARC, EU etc. There appears to be wide potential for future market-integration studies focused on how market integration varies with types of distances (geographic, institutional, cultural etc.), including variation in the qualities and sources of financial market integration.

Financial market integration can be examined using various advance approaches such as wavelet analysis (e.g., Goodell and Goutte, 2021), multivariate modeling (e.g., Gębka and Karoglou, 2013); and total spillover analysis (Diebold and Yilmaz, 2012). Examining the international financial market integration using higher frequency data is also getting more attention from researchers (e.g., Borgioli et al., 2020). Financial integration among the trade partners is also an important area as global trade increases among the markets (e.g., Chambet and Gibson, 2008). Future studies can also explore further the topological structures of financial networks in financial market integration. Current studies in this respect focus on single-country analysis (Bougheas and Kirman, 2015), suggesting the utility of future cross-national studies.

7.2 Impacts of financial market linkage by crises, extraordinary events, and formations of associations

This area of how financial market linkage is impacted by crises, extraordinary events, and formations of association has wide potential scope. This includes exploring impact on financial market integration with respect to regional and global level financial crises. (Ahrend and Goujard, 2014; Sehgal *et. al.,* 2016; Pardal *et al.,*2020). Further, the integration between developed and emerging markets is still under explored, especially with regards to financial crises, including how crises change integration. Other areas of research have included exploring changes in market integration post establishment of regional organization, such as the forming of the Euro area, or, more recently Brexit, Eurasian Economic Union (EAEU), African Monetary Union (AMU). Further, the study can be done to examine the financial market integration with respect to a) free trade zone formation, b) institutional reforms taken to reduce the trade barriers, c) globalization, d) launching the regional economic integration schemes, and e) undertaking the Domestic Institutional Investors (DII) and Foreign Institutional Investors (FII) programs.

7.3 Time varying financial market integration

The stochastic variability of financial market integration is less explored, as are the conditioning roles investor risk preferences, portfolio outcomes, and stock-bond market time-varying co-movements. An under-explored area is the impact on integration, of time-varying investor risk preferences resulting from the financial shocks. This extends to considering the impact of integration on portfolio optimization.

***7.4 Co-movements among oil, stock, real estate, commodity, bond, and crypto currency markets***

Linkages between the stock and bond markets is explored in past studies, but levels of integration between these markets can be further measured by adopting new approaches. Co-movements between real estate and stocks are also examined, though for a limited number of countries, as is the distinction between short- and long-term linkages between these markets. Examinations of such linkages are difficult for many markets.

Another area underexplored is integration among commodity markets and stock markets. Co-movements between oil and stock prices can be explored further (see Corbet, Goodell & Gunay). The impact of changes in oil prices on integrations among financial markets appears underexplored. By using asymmetric models or cyclical structures, the relationships between oil prices and stock markets can be further studied. Further, linkages, and regional differences in linkages, between various energy markets can be further studied.

*7.5 Portfolio diversification with financial market integration*

The impact of market integration on optimal portfolio diversification can be explored with respect to asset financial pricing, and asset allocation. For instance, is international portfolio diversification always beneficial in terms of risk and return? What are the impacts of international diversification on the asset pricing and systematic risk? Further, research evidences that frontier markets are the least integrated. This motivates further study to identify portfolio opportunities vis-à-vis frontier markets. Another important area to explore is asset allocation for the purpose of portfolio rebalancing.

We outline gaps in the literature in our identified five research streams in the form of 67 research questions. These are presented in Table 8.

(Please insert Table 8 about here)

**8.Conclusion**

This paper is the first study to utilize qualitative (content analysis) and quantitative (bibliometric citation analysis) techniques to conduct a meta-review of the financial market integration (FMI) literature. We analyze 260 articles, over that last 40 years, the we identify from the *Scopus* database. We use the *VOSviewer* software programs for the bibliometric analysis. We also conduct several additional analyses to establish a meta-literature review: (i) co-citation analysis; (ii) co-authorship analysis; (iii) cartographic analysis; and (iv) content analysis.

We contribute by identifying important aspects of FMI literature, including top journals, authors, most studied and least studied countries, and influential and trending articles and topics. We also identify five main research streams in the literature: (1) portfolio diversification with financial market integration; (2) equity market integration in general; (3) financial market linkage with respect to crises, other events, and formations of association; (4) the characteristics of time varying financial market integration; and (5) co-movement among oil, stock, real estate, commodity, bond, and crypto currency markets. Additionally, we demonstrate the co-authorship network of FMI researchers, recognizing influential authors. Finally, we present a wide array of questions for future research.

Given the ongoing widespread interest of finance scholarship in market integration, as well as the relevance of market integration for policy makers and portfolio managers, our encapsulating assessment of FMI literature should be of great interest.

**References**

Aggarwal, R., & Kyaw, N. A. (2005). Equity market integration in the NAFTA region: Evidence from unit root and cointegration tests. International Review of Financial Analysis, 14(4), 393-406.

Akbari, A., Ng, L., & Solnik, B. (2021). Drivers of economic and financial integration: A machine learning approach. Journal of Empirical Finance, 61, 82-102.

Akdogan, H. (1992). Behavior of systematic risk in a regionally integrated model for stock prices. Economics Letters, 39(2), 213-216.

Alon, I., Anderson, J., Munim, Z. H., & Ho, A. (2018). A Review of the Internationalization of Chinese Enterprises. Asia Pacific Journal of Management, 35(3), 573-605.

Antonakakis, N., Cunado, J., Filis, G., Gabauer, D., & De Gracia, F. P. (2018). Oil volatility, oil and gas firms and portfolio diversification. Energy Economics, 70, 499-515.

Apriliyanti, I. D., & Alon, I. (2017). Bibliometric Analysis of Absorptive Capacity. International Business Review, 26(5), 896–907.

Arshanapalli, B., & Doukas, J. (1993). International stock market linkages: Evidence from the pre-and post-October 1987 period. Journal of Banking & Finance, 17(1), 193-208.

Asgharian, H., Hess, W., & Liu, L. (2013). A spatial analysis of international stock market linkages. Journal of Banking & Finance, 37(12), 4738-4754.

Baele, L., & Inghelbrecht, K. (2009). Time-varying integration and international diversification strategies. Journal of Empirical Finance, 16(3), 368-387.

Baele, L., & Inghelbrecht, K. (2010). Time-varying integration, interdependence and contagion. Journal of International Money and Finance, 29(5), 791-818.

Bahoo, S., Alon, I., & Paltrinieri, A. (2020). Sovereign wealth funds: Past, present and future. International Review of Financial Analysis, 67, 101418.

Bahoo, S., Hassan, M. K., Paltrinieri, A., & Khan, A. (2019). A Model of the Islamic Sovereign Wealth Fund. Islamic Economic Studies, 27(1), 2–22.

Bahoo, S., Saeed, S., Iqbal, M. J., & Nawaz, S. (2018). Role of China-Pakistan Economic Corridor in Pakistan’ s Trade, Investment , Energy , Infrastructure , and Stock Market. Journal of Independent Studies and Research-Management, Social Sciences and Economics, 16(1), 63–84.

Ball, R., and D. Tunger. (2006). Science indicators revisited–Science Citation Index versus SCOPUS: A bibliometric comparison of both citation databases. Information Services & Use 26 (4), 293–301.

Ballester, L., Díaz-Mendoza, A. C., & González-Urteaga, A. (2019). A systematic review of sovereign connectedness on emerging economies. International Review of Financial Analysis, 62, 157–163.

Balli, F., Balli, H. O., Louis, R. J., & Vo, T. K. (2015). The transmission of market shocks and bilateral linkages: Evidence from emerging economies. International Review of Financial Analysis, 42, 349-357.

Bartram, S. M., Taylor, S. J., & Wang, Y. H. (2007). The Euro and European financial market dependence. Journal of Banking & Finance, 31(5), 1461-1481.

Batten, J. A., Kinateder, H., Szilagyi, P. G., & Wagner, N. F. (2019). Time-varying energy and stock market integration in Asia. Energy Economics, 80, 777-792.

Beine, M., & Candelon, B. (2011). Liberalisation and stock market co-movement between emerging economies. Quantitative Finance, 11(2), 299-312.

Beine, M., Cosma, A., & Vermeulen, R. (2010). The dark side of global integration: Increasing tail dependence. Journal of Banking & Finance, 34(1), 184-192.

Bekaert, G. (1995). Market integration and investment barriers in emerging equity markets. The World Bank Economic Review, 9(1), 75-107.

Bekaert, G., & Harvey, C. R. (1995). Time‐varying world market integration. the Journal of Finance, 50(2), 403-444.

Bekaert, G., Harvey, C. R., Lundblad, C. T., & Siegel, S. (2013). The European Union, the Euro, and equity market integration. Journal of Financial Economics, 109(3), 583-603.

Bekaert, G., Hodrick, R. J., & Zhang, X. (2009). International stock return comovements. The Journal of Finance, 64(6), 2591-2626.

BenSaïda, A., & Litimi, H. (2020). Financial contagion across G10 stock markets: A study during major crises. International Journal of Finance & Economics.

BenSaïda, A., Boubaker, S., & Nguyen, D. K. (2018). The shifting dependence dynamics between the G7 stock markets. Quantitative Finance, 18(5), 801-812.

Berben, R. P., & Jansen, W. J. (2005). Comovement in international equity markets: A sectoral view. Journal of International Money and Finance, 24(5), 832-857.

Berger, D., Pukthuanthong, K., & Yang, J. J. (2011). International diversification with frontier markets. Journal of Financial Economics, 101(1), 227-242.

Berger, T., & Pozzi, L. (2013). Measuring time-varying financial market integration: An unobserved components approach. Journal of Banking & Finance, 37(2), 463-473.

Bessler, W., Conlon, T., & Huan, X. (2019). Does corporate hedging enhance shareholder value? A meta-analysis. International Review of Financial Analysis, 61, 222–232.

Białkowski, J., & Perera, D. (2019). Stock index futures arbitrage: Evidence from a metaanalysis. International Review of Financial Analysis, 61, 284–294.

Billio, M., Donadelli, M., Paradiso, A., & Riedel, M. (2017). Which market integration measure?. Journal of Banking & Finance, 76, 150-174.

Boako, G., Alagidede, I. P., Sjo, B., & Uddin, G. S. (2020). Commodities price cycles and their interdependence with equity markets. Energy Economics, 91, 104884.

Bracker, K., Docking, D. S., & Koch, P. D. (1999). Economic determinants of evolution in international stock market integration. Journal of Empirical Finance, 6(1), 1-27.

Bradford, S.C. (1934). Sources of information on specific subjects. Engineering 137: 85–86.

Brooks, R., & Del Negro, M. (2004). The rise in comovement across national stock markets: market integration or IT bubble?. Journal of Empirical Finance, 11(5), 659-680.

Cagliesi, G., & Guidi, F. (2021). A three-tiered nested analytical approach to financial integration: The case of emerging and frontier equity markets. International Review of Financial Analysis, 74, 101698.

Caporale, G. M., Cipollini, A., & Spagnolo, N. (2005). Testing for contagion: a conditional correlation analysis. Journal of Empirical Finance, 12(3), 476-489.

Carrieri, F., Errunza, V., & Hogan, K. (2007). Characterizing world market integration through time. Journal of Financial and Quantitative Analysis, 42 (4), 915-940.

Cheng, A. R., Jahan-Parvar, M. R., & Rothman, P. (2010). An empirical investigation of stock market behavior in the Middle East and North Africa. Journal of Empirical Finance, 17(3), 413-427.

Chesney, M., Reshetar, G., & Karaman, M. (2011). The impact of terrorism on financial markets: An empirical study. Journal of Banking & Finance, 35(2), 253-267.

Cho, S., Hyde, S., & Nguyen, N. (2015). Time-varying regional and global integration and contagion: Evidence from style portfolios. International Review of Financial Analysis, 42, 109-131.

Chowdhury, B., Dungey, M., Kangogo, M., Sayeed, M. A., & Volkov, V. (2019). The changing network of financial market linkages: The Asian experience. International Review of Financial Analysis, 64, 71-92.

Chowdhury, M. B. (2005). Trade reforms and economic integration in South Asia: SAARC to SAPTA. Applied Econometrics and International Development, 5(4), 23–40.

Ciner, C. (2013). Oil and stock returns: Frequency domain evidence. Journal of International Financial Markets, Institutions and Money, 23, 1-11.

Click, R. W., & Plummer, M. G. (2005). Stock market integration in ASEAN after the Asian financial crisis. Journal of Asian Economics, 16(1), 5-28.

Corbet, S., Goodell, J. W., & Günay, S. (2020). Co-movements and spillovers of oil and renewable firms under extreme conditions: New evidence from negative WTI prices during COVID-19. Energy economics, 92, 104978.

Corbet, S., Lucey, B., Urquhart, A., & Yarovaya, L. (2019). Cryptocurrencies as a financial asset: A systematic analysis. International Review of Financial Analysis, 62, 182–199.

D’Ecclesia, R. L., & Costantini, M. (2006). Comovements and correlations in international stock markets. The European Journal of Finance, 12(6-7), 567-582.

De Jong, F., & De Roon, F. A. (2005). Time-varying market integration and expected returns in emerging markets. Journal of financial economics, 78(3), 583-613.

Deku, S. Y., Kara, A., & Zhou, Y. (2018). Securitization, bank behaviour and financial stability: A systematic review of the recent empirical literature. International Review of Financial Analysis, 62, 245–252.

Delatte, A. L., & Lopez, C. (2013). Commodity and equity markets: Some stylized facts from a copula approach. Journal of Banking & Finance, 37(12), 5346-5356.

Devereux, M. B., & Yu, C. (2020). International financial integration and crisis contagion. The Review of Economic Studies, 87(3), 1174-1212.

Dias, R., da Silva, J. V., & Dionísio, A. (2019). Financial markets of the LAC region: Does the crisis influence the financial integration?. International Review of Financial Analysis, 63, 160-173.

Dicle, M. F., & Levendis, J. (2011). Greek market efficiency and its international integration. Journal of International Financial Markets, Institutions and Money, 21(2), 229-246.

Dimitriou, D., Kenourgios, D., & Simos, T. (2013). Global financial crisis and emerging stock market contagion: A multivariate FIAPARCH–DCC approach. International Review of Financial Analysis, 30, 46-56.

Ding, Y., Chowdhury, G. G., & Foo, S. (2001). Bibliometric Cartography of Information Retrieval Research by Using Co-Word Analysis. Information Processing and Management, 37(6), 817–842.

el Alaoui, A. O., Dewandaru, G., Rosly, S. A., & Masih, M. (2015). Linkages and co-movement between international stock market returns: Case of Dow Jones Islamic Dubai Financial Market index. Journal of International Financial Markets, Institutions and Money, 36, 53-70.

Elfakhani, S., Arayssi, M., & Smahta, H. A. (2008). Globalization and investment opportunities: a cointegration study of Arab, US, and emerging stock markets. Financial Review, 43(4), 591-611.

Fahimnia, B., J. Sarkis, and H. Davarzani. (2015). Green supply chain management: A review and bibliometric analysis. International Journal of Production Economics 162, 101–114.

Feng, Y., Q. Zhu, and K.H. Lai. (2017). Corporate social responsibility for supply chain management: A literature review and bibliometric analysis. Journal of Cleaner Production 158, 296–307.

Fernau, E., & Hirsch, S. (2019). What drives dividend smoothing? A meta regression analysis of the Lintner model. International Review of Financial Analysis, 61, 227–255.

Fetscherin, M., & Heinrich, D. (2015). Consumer Brand Relationships Research: A Bibliometric Citation Meta-Analysis. Journal of Business Research, 68(2), 380–390.

Fetscherin, M., Voss, H., & Gugler, P. (2010). 30 Years of Foreign Direct Investment to China: An Interdisciplinary Literature Review. International Business Review, 19(3), 235–246.

Fratzscher, M. (2002). Financial market integration in Europe: on the effects of EMU on stock markets. International Journal of Finance & Economics, 7(3), 165-193.

French, D., & Vigne, S. (2019). The causes and consequences of household financial strain: A systematic review. International Review of Financial Analysis, 62, 150–156.

Frijns, B., Tourani-Rad, A., & Indriawan, I. (2012). Political crises and the stock market integration of emerging markets. Journal of Banking & Finance, 36(3), 644-653.

Ftiti, Z., Guesmi, K., & Abid, I. (2016). Oil price and stock market co-movement: What can we learn from time-scale approaches?. International review of financial analysis, 46, 266-280.

Garner, J., Humphrey, P. R., & Simkins, B. (2016). The business of sport and the sport of business: A review of the compensation literature in finance and sports. International Review of Financial Analysis, 47, 197–204.

Geyer-Klingeberg, J., Hang, M., & Rathgeber, A. W. (2018). What drives financial hedging? A meta-regression analysis of corporate hedging determinants. International Review of Financial Analysis, 61(1), 203–221.

Ghosh, S., & Kanjilal, K. (2016). Co-movement of international crude oil price and Indian stock market: Evidences from nonlinear cointegration tests. Energy Economics, 53, 111-117.

Gil-Alana, L. A., & Yaya, O. S. (2014). The relationship between oil prices and the Nigerian stock market. An analysis based on fractional integration and cointegration. Energy Economics, 46, 328-333.

Glascock, J. L., Lu, C., & So, R. W. (2000). Further evidence on the integration of REIT, bond, and stock returns. The Journal of Real Estate Finance and Economics, 20(2), 177-194.

Glass, G. V. (1976). Primary, Secondary, and Meta-Analysis of Research. Educational Researcher, 5(10), 3-8.

Goodell, J. W., & Goutte, S. (2021). Co-movement of COVID-19 and Bitcoin: Evidence from wavelet coherence analysis. Finance Research Letters, 38, 101625.

Graham, M., & Nikkinen, J. (2011). Co-movement of the Finnish and international stock markets: a wavelet analysis. The European Journal of Finance, 17(5-6), 409-425.

Gravelle, T., Kichian, M., & Morley, J. (2006). Detecting shift-contagion in currency and bond markets. Journal of International Economics, 68(2), 409-423.

Grubel, H. G. (1968). Internationally diversified portfolios: welfare gains and capital flows. The American Economic Review, 58 (5): 1299-1314.

Gupta, R., & Guidi, F. (2012). Cointegration relationship and time varying co-movements among Indian and Asian developed stock markets. International Review of Financial Analysis, 21, 10-22.

Harkmann, K. (2020). Integration of the Baltic stock markets with developed European markets. International Journal of Finance & Economics.

Hartmann, P., Straetmans, S., & Vries, C. D. (2004). Asset market linkages in crisis periods. Review of Economics and Statistics, 86(1), 313-326.

Hiang Liow, K. (2012). Co‐movements and correlations across Asian securitized real estate and stock markets. Real Estate Economics, 40(1), 97-129.

Howe, J. S., & Madura, J. (1990). The impact of international listings on risk: Implications for capital market integration. Journal of Banking & Finance, 14(6), 1133-1142.

Huang, W., Goodell, J., & Goyal, A. (2021). In times of crisis does ownership matter? Liquidity extraction through dividends during the 2007–2009 financial crisis. Journal of International Financial Markets, Institutions and Money, 101380.

Hupperets, E. C., & Menkveld, A. J. (2002). Intraday analysis of market integration: Dutch blue chips traded in Amsterdam and New York. Journal of Financial Markets, 5(1), 57-82.

Huyghebaert, N., & Wang, L. (2010). The co-movement of stock markets in East Asia: Did the 1997–1998 Asian financial crisis really strengthen stock market integration?. China Economic Review, 21(1), 98-112.

Ibrahim, M. H. (2005). International linkage of stock prices: The case of Indonesia. Management Research News, 28 (4), 93–115.

Ji, Q., Bouri, E., Lau, C. K. M., & Roubaud, D. (2019). Dynamic connectedness and integration in cryptocurrency markets. International Review of Financial Analysis, 63, 257-272.

Jian, Z., & Li, X. (2021). Skewness-based market integration: A systemic risk measure across international equity markets. International Review of Financial Analysis, 74, 101664.

Jiang, Z., & Yoon, S. M. (2020). Dynamic co-movement between oil and stock markets in oil-importing and oil-exporting countries: Two types of wavelet analysis. Energy Economics, 90, 104835.

Kenen, P. B. (1976). Capital mobility and financial integration: a survey (No. 39). International Finance Section, Department of Economics, Princeton University.

Kim, J., & McMillan, S. J. (2008). Evaluation of Internet Advertising Research: A Bibliometric Analysis of Citations from Key Sources. Journal of Advertising, 37(1), 99–112.

Kim, K., & Lee, D. (2020). Equity market integration and portfolio rebalancing. Journal of Banking & Finance, 113, 105775.

Kim, S. J., Lucey, B. M., & Wu, E. (2006). Dynamics of bond market integration between established and accession European Union countries. Journal of International Financial Markets, Institutions and Money, 16(1), 41-56.

Kim, S. J., Moshirian, F., & Wu, E. (2005). Dynamic stock market integration driven by the European Monetary Union: An empirical analysis. Journal of Banking & Finance, 29(10), 2475-2502.

Kollias, C., Kyrtsou, C., & Papadamou, S. (2013). The effects of terrorism and war on the oil price–stock index relationship. Energy Economics, 40, 743-752.

Lane, P. R., & Milesi-Ferretti, G. M. (2007). The external wealth of nations mark II: Revised and extended estimates of foreign assets and liabilities, 1970–2004. Journal of international Economics, 73(2), 223-250.

Lee, E. J. (2017). Intra-and inter-regional portfolio diversification strategies under regional market integration: Evidence from US global banks. International Review of Financial Analysis, 54, 1-22.

Lee, H., & Kim, H. (2020). Time varying integration of European stock markets and monetary drivers. Journal of Empirical Finance, 58, 369-385.

Liu, X., Bollen, J., Nelson, M. L., & Sompel, H. V. D. (2005). Co-Authorship Networks in the Digital Library Research Community. Information Processing & Management, 41(6), 1462–1480.

Lok, E., & Kalev, P. S. (2006). The intraday price behaviour of Australian and New Zealand cross-listed stocks. International Review of Financial Analysis, 15(4-5), 377-397.

Ma, Y. R., Ji, Q., Wu, F., & Pan, J. (2021). Financialization, idiosyncratic information and commodity co-movements. Energy Economics, 94, 105083.

Masih, R., & Masih, A. M. (2001). Long and short term dynamic causal transmission amongst international stock markets. Journal of international Money and Finance, 20(4), 563-587.

Meric, G., Leal, R. P., Ratner, M., & Meric, I. (2001). Co-movements of US and Latin American equity markets before and after the 1987 crash. International Review of Financial Analysis, 10(3), 219-235.

Meric, I., & Meric, G. (1989). Potential gains from international portfolio diversification and inter-temporal stability and seasonality in international stock market relationships. Journal of Banking & Finance, 13(4-5), 627-640.

Mishra, D., A. Gunasekaran, T. Papadopoulos, and S.J. Childe. (2018). Big Data and supply chain management: A review and bibliometric analysis. Annals of Operations Research 270 (1–2): 313–336.

Narayan, S., Le, T. H., & Sriananthakumar, S. (2018). The influence of terrorism risk on stock market integration: Evidence from eight OECD countries. International Review of Financial Analysis, 58, 247-259.

Nardo, M., Ossola, E., & Papanagiotou, E. (2021). Financial integration in the EU28 equity markets: measures and drivers. Journal of Financial Markets, 100633.

Nguyen, V. H. T., & Boateng, A. (2015). Bank excess reserves in emerging economies: A critical review and research agenda. International Review of Financial Analysis, 39, 158–166.

Øyna, S., & Alon, I. (2018). A review of born global. International Studies of Management & Organization, 48(2), 157–180.

Paltrinieri, A., Hassan, M. K., Bahoo, S., & Khan, A. (2019). A Bibliometric Review of Sukuk Literature. International Review of Economics & Finance, (In Press).

Panchenko, V., & Wu, E. (2009). Time-varying market integration and stock and bond return concordance in emerging markets. Journal of Banking & Finance, 33(6), 1014-1021.

Papadamou, S., Kyriazis, Ν., & Tzeremes, P. G. (2019). Unconventional monetary policy effects on output and inflation: A meta-analysis. International Review of Financial Analysis, 61, 295–305.

Patel, J. R. (2017). Co-movement and integration among stock markets: A study of 14 countries. Indian journal of finance, 11(9), 53-66.

Patel, R. (2019). Wealth Effects of Bank Mergers: Evidence from Shareholder Returns. The Journal of Wealth Management, 22(1), 86-95.

Patel, R. (2021). Equity Market Integration and Portfolio Decisions: A Study of NASDAQ USA and MSCI Emerging Markets Asia Indexes. The Journal of Wealth Management, 24(1), 11-39.

Patel, R. J. (2019). BRICS emerging markets linkages: Evidence from the 2008 Global Financial Crisis. The Journal of Private Equity, 22(4), 42-59.

Patel, R. J. (2019). International trade and stock market integration: Evidence from study of India and its major trading partners. The Journal of Private Equity, 23(1), 90-109.

Patra, S., & Panda, P. (2021). Spillovers and financial integration in emerging markets: Analysis of BRICS economies within a VAR‐BEKK framework. International Journal of Finance & Economics, 26(1), 493-514.

Pérez-Calero, L., Hurtado-González, J. M., & López-Iturriaga, F. J. (2019). Do the institutional environment and types of owners influence the relationship between ownership concentration and board of director independence? An international meta-analysis. International Review of Financial Analysis, 61, 233–244.

Piette, M. J. and Ross, K. L. (1992) An Analysis of The Determinants of Co-Authorship in Economics. Journal of Economic Education, 23(3), 277–283.

Potter, W. J., & Levine-Donnerstein, D. (1999). Rethinking Validity and Reliability in Content Analysis. Journal of Applied Communication Research, 27(3), 258–284.

Qiao, Z., Chiang, T. C., & Wong, W. K. (2008). Long-run equilibrium, short-term adjustment, and spillover effects across Chinese segmented stock markets and the Hong Kong stock market. Journal of International Financial Markets, Institutions and Money, 18(5), 425-437.

Reboredo, J. C. (2018). Green bond and financial markets: Co-movement, diversification and price spillover effects. Energy Economics, 74, 38-50.

Rockinger, M., & Urga, G. (2001). A time varying parameter model to test for predictability and integration in the stock markets of transition economies. Journal of Business & Economic Statistics, 19(1), 73-84.

Rughoo, A., & You, K. (2016). Asian financial integration: Global or regional? Evidence from money and bond markets. International Review of Financial Analysis, 48, 419-434.

Sensoy, A., & Omole, J. (2018). Implied volatility indices: A review and extension in the Turkish case. International Review of Financial Analysis, 60, 151–161.

Sewraj, D., Gebka, B., & Anderson, R. D. (2018). Identifying contagion: A unifying approach. Journal of International Financial Markets, Institutions and Money, 55, 224-240.

Song, Y., Huang, R., Paramati, S. R., & Zakari, A. (2021). Does economic integration lead to financial market integration in the Asian region?. Economic Analysis and Policy, 69, 366-377.

Subrahmanyam, M. G. (1975). On the optimality of international capital market integration. Journal of Financial Economics, 2(1), 3-28.

Tong, C., Chen, J., & Buckle, M. J. (2018). A network visualization approach and global stock market integration. International Journal of Finance & Economics, 23(3), 296-314.

Van Eck, N. J., & Waltman, L. (2010). Software Survey: VOSviewer, A Computer Program for Bibliometric Mapping. Scientometrics, 84(2), 523–538.

Van Eck, N. J., & Waltman, L. (2014). Visualizing bibliometric networks. Measuring Scholarly Impact.

Varela, O., & Lee, S. H. (1993). International listings, the security market line and capital market integration: The case of US listings on the London stock exchange. Journal of Business Finance & Accounting, 20(6), 843-863.

Vermeulen, R. (2013). International diversification during the financial crisis: A blessing for equity investors?. Journal of International Money and Finance, 35, 104-123.

Vieira, E.S., and J.A. Gomes. (2009). A comparison of Scopus and Web of Science for a typical university. Scientometrics 81 (2): 587.

Virk, N., & Javed, F. (2017). European equity market integration and joint relationship of conditional volatility and correlations. Journal of International Money and Finance, 71, 53-77.

Voronkova, S. (2004). Equity market integration in Central European emerging markets: A cointegration analysis with shifting regimes. International Review of Financial Analysis, 13(5), 633-647.

Vos, R. (1988). Savings, investment and foreign capital flows: Have capital markets become more integrated?. The Journal of Development Studies, 24(3), 310-334.

Wang, L. (2014). Who moves East Asian stock markets? The role of the 2007–2009 global financial crisis. Journal of International Financial Markets, Institutions and Money, 28, 182-203.

Werner, I. M., & Kleidon, A. W. (1996). UK and US trading of British cross-listed stocks: An intraday analysis of market integration. The Review of Financial Studies, 9(2), 619-664.

Wu, F. (2020). Stock market integration in East and Southeast Asia: The role of global factors. International Review of Financial Analysis, 67, 101416.

Yu, I. W., Fung, K. P., & Tam, C. S. (2010). Assessing financial market integration in Asia–equity markets. Journal of Banking & Finance, 34(12), 2874-2885.

Zamore, S., Ohene Djan, K., Alon, I., & Hobdari, B. (2018). Credit Risk Research: Review and Agenda. Emerging Markets Finance and Trade, 54(4), 811–835.

Zott, C., Amit, R., & Massa, L. (2011). The Business Model: Recent Developments and Future Research. Journal of Management, 37(4), 1019–1042.

**Table 1:** Sample selection process and identification of keywords through cartographic analysis

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Search Word | Period | Search Technique | Initial Search Results | Final Sample (After Exclusion) | Analyses | Identification of Research Streams  (Co-Citation analysis) | Keywords in Each Stream  (Cartographic analysis) |
| # Articles |
| “Financial market integration”  OR | 1969 - 2021 | Scopus | 2010 | 151 | Meta-Literature Review  (i. Bibliometric citation analysis, ii. Content analysis) | 1. Portfolio diversification with financial market integration | Financial market integration; Portfolio diversification; European stock markets |
| "Equity market integration"  OR | 1976 - 2021 | Scopus | 566 | 12 | 2. Equity market integration in general | Stock market comovement; Equity market integration |
| “Financial market linkages”  OR | 1979 - 2021 | Scopus | 944 | 22 | 3. Financial market linkage with respect to crisis, event, and formation of association | Market integration; Crisis; Asia; Latin America |
| “Stock market integration”  OR | 1982 - 2021 | Scopus | 1257 | 64 | 4. Time varying financial market integration | International financial integration; Time; Contagion |
| “Stock market co-movement” | 1981-2021 | Scopus | 451 | 11 | 5. Co-movement among the oil, stock , real estate, commodity, bond markets and cryptocurrency markets | Stock market; Regional market integration; Oil |
| Total number of articles | | | **5228** | **260** |  | | |
| *Note*: The table presents the sample selection process, final sample size, and keywords identified through cartographic analysis. The table also lists the keywords for each research stream identified through the cartographic analysis. | | | | | | | |

**Table 2 Most and least studied countries**

|  |  |  |  |
| --- | --- | --- | --- |
| **Most-studied countries** | | **Least-studied countries**  **ARE THERE ANY COUNTRIES WITH ZERO?** | |
| **Country** | **Times studied** | **Country** | **Times studied** |
| USA | 176 | Angola | 1 |
| UK | 134 | Azerbaijan | 1 |
| Germany | 114 | Brunei | 1 |
| Japan | 103 | Burundi | 1 |
| France | 99 | Cambodia | 1 |
| Italy | 76 | Cameroon | 1 |
| Hong Kong | 66 | El Salvador | 1 |
| Netherlands | 65 | Fiji | 1 |
| South Korea | 62 | Gabon | 1 |
| Spain | 60 | Guatemala | 1 |
| Canada | 59 | Guinea | 1 |
| Belgium | 58 | Haiti | 1 |
| China | 57 | Honduras | 1 |
| Thailand | 57 | Iran | 1 |
| Malaysia | 56 | Laos | 1 |
| Australia | 54 | Myanmar | 1 |
| Switzerland | 54 | Nepal | 1 |
| Mexico | 52 | Papua New Guinea | 1 |
| Singapore | 52 | Swaziland | 1 |

Source: Author's calculation from the content analysis

**Table 3 Top influential journals**

|  |  |  |  |
| --- | --- | --- | --- |
| **Panel A: # papers** | | | |
| **Rank** | | **Journal** | **# papers** |
| 1 | | *International Review of Financial Analysis* | 33 |
| 2 | | *Journal of Banking and Finance* | 30 |
| 3 | | *Journal of International Money and Finance* | 30 |
| 4 | | *Journal of International Financial Markets, Institutions and Money* | 28 |
| 5 | | *Journal of Empirical Finance* | 16 |
| 6 | | *Energy Economics* | 15 |
| 7 | | *International Journal of Finance and Economics* | 11 |
| 8 | | *Economics Letters* | 9 |
| 9 | | *European Journal of Finance* | 8 |
| 10 | | *Journal of Business, Finance and Accounting* | 6 |
| **Panel B: # citations** | | | |
| **Rank** | **Journal** | | **# citations** |
| 1 | *Journal of Banking and Finance* | | *2,080* |
| 2 | *Journal of International Money and Finance* | | *1,387* |
| 3 | *Journal of International Economics* | | *1,130* |
| 4 | *International Review of Financial Analysis* | | *965* |
| 5 | *Journal of International Financial Markets, Institutions and Money* | | *781* |
| 6 | *Journal of Empirical Finance* | | *780* |
| 7 | *Journal of Financial Economics* | | *695* |
| 8 | *Journal of Finance* | | *593* |
| 9 | *Energy Economics* | | *510* |
| 10 | *Economics Letters* | | *393* |
| **Panel C: Cites per document** | | | |
| **Rank** | **Journal** | | **Cites per document** |
| 1 | *Journal of Banking and Finance* | | 69.33 |
| 2 | *Journal of Empirical Finance* | | 48.75 |
| 3 | *Journal of International Money and Finance* | | 46.23 |
| 4 | *Journal of Business, Finance and ccounting* | | 43.67 |
| 5 | *Economics Letters* | | 43.67 |
| 6 | *Energy Economics* | | 34.00 |
| 7 | *International Journal of Finance and Economics* | | 31.91 |
| 8 | *International Review of Financial Analysis* | | 29.24 |
| 9 | *Journal of International Financial Markets, Institutions and Money* | | 27.89 |
| 10 | *European Journal of Finance* | | 14.38 |

**Table 4 Top influential authors**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Panel A: # documents** | | | | |
| **Rank** | **Author** | | **University/institution** | **# documents** |
| 1 | Geert Bekaert | | Columbia Business School, United States | 6 |
| 2 | Eliza Wu | | The University of Sydney, Australia | 5 |
| 3 | Brian M. Lucey | | Trinity College Dublin, Ireland | 4 |
| 4 | Hossein Asgharian | | Knut Wicksell Centre for Financial Studies, Sweden | 3 |
| 5 | Lieven Baele | | Tilburg University, Netherlands | 3 |
| 6 | Michel Beine | | University of Luxembourg, Luxembourg | 3 |
| 7 | Patricia Chelley-Steeley | | Birmingham Business School, United Kingdom | 3 |
| 8 | Khaled Guesmi | | PSB Paris School of Business, France | 3 |
| 9 | Campbell R. Harvey | | Fuqua School of Business, United States | 3 |
| 10 | Suk-Joong Kim | | The University of Sydney, Australia | 3 |
| 11 | Gulser Meric | | Rowan University, United States | 3 |
| 12 | Ilhan Meric | | Rider University, United States | 3 |
| 13 | Jian Yang | | University of Colorado Denver, United States | 3 |
| **Panel B: # citations** | | | | | |
| **Rank** | | **Author** | **University/institution** | **# citations** | |
| 1 | | Philip R. Lane | European Central Bank, Germany | 1045 | |
| 2 | | Gian Maria Milesi-Ferretti | International Monetary Fund, United States | 1045 | |
| 3 | | Geert Bekaert | Columbia Business School, United States | 872 | |
| 4 | | Campbell R. Harvey | Fuqua School of Business, United States | 438 | |
| 5 | | Eliza Wu | The University of Sydney, Australia | 398 | |
| 6 | | Bala Arshanapalli | Indiana University Northwest, United States | 329 | |
| 7 | | John Doukas | Old Dominion University, United States | 329 | |
| 8 | | FariborzMoshirian | UNSW Sydney, Sydney, Australia | 284 | |
| 9 | | Robin L. Lumsdaine | National Bureau of Economic Research, United States | 279 | |
| 10 | | Casper G. De Vries | Erasmus Universiteit Rotterdam, Netherlands | 257 | |
| 11 | | Philipp Hartmann | European Central Bank, Germany | 257 | |
| 12 | | Stefan T.M. Straetmans | Maastricht University, Netherlands | 257 | |
| **Panel C: Citations per paper** | | | | | |
| **Rank** | | **Author** | **Iinstitution** | **Citations per paper** | |
| 1 | | Campbell Harvey | Fuqua School of Business, United States | 146 | |
| 2 | | Geert Bekaert | Columbia Business School, United States | 145.33 | |
| 3 | | Fariborz Moshirian | UNSW Sydney, Australia | 142 | |
| 4 | | Nikolaos Antonakakis | Portsmouth Business School, United Kingdom | 122 | |
| 5 | | George Fil | Bournemouth University, United Kingdom | 122 | |
| 6 | | Elie Bouri | Holy Spirit University of Kaslik USEK, Lebanon | 106 | |
| 7 | | John L. Glascock | University of Connecticut, United States | 104.5 | |
| 8 | | Kate Phylaktis | CityUniversity of London,United Kingdom | 103.5 | |
| 9 | | Marcel Fratzscher | Centre for Economic Policy Research,United Kingdom | 93.5 | |
| 10 | | Svitlana Voronkova | Zentrum für Europäische Wirtschaftsforschung GmbH, Germany | 86.5 | |
| 11 | | Eliza Wu | The University of Sydney, Australia | 79.6 | |

**Table 5 Top cited articles**

|  |  |  |  |
| --- | --- | --- | --- |
| **Rank** | **Article** | **Journal** | **Citations** |
| 1 | Lane and Milesi-Ferretti (2007) | *Journal of International Economics* | 1,045 |
| 2 | Arshanapalli and Doukas (1993) | *Journal of Banking and Finance* | 329 |
| 3 | Bekaert et al. (2002) | *Journal of Financial Economics* | 279 |
| 4 | Hartmann et al. (2004) | *Review of Economics and Statistics* | 257 |
| 5 | Bekaert (1995) | *World Bank Economic Review* | 254 |
| 6 | Jorion and Schwartz (1986) | *Journal of Finance* | 234 |
| 7 | Chen et al.(2002) | *Journal of Banking and Finance* | 214 |
| 8 | Baxter and Jermann (1997) | *American Economic Review* | 213 |
| 9 | Norden and Weber (2009) | *European Financial Management* | 210 |
| 10 | Carrieri et al.(2007) | *Journal of Financial and Quantitative Analysis* | 207 |
| 11 | Antonakakis et al. (2013) | *Economics Letters* | 205 |

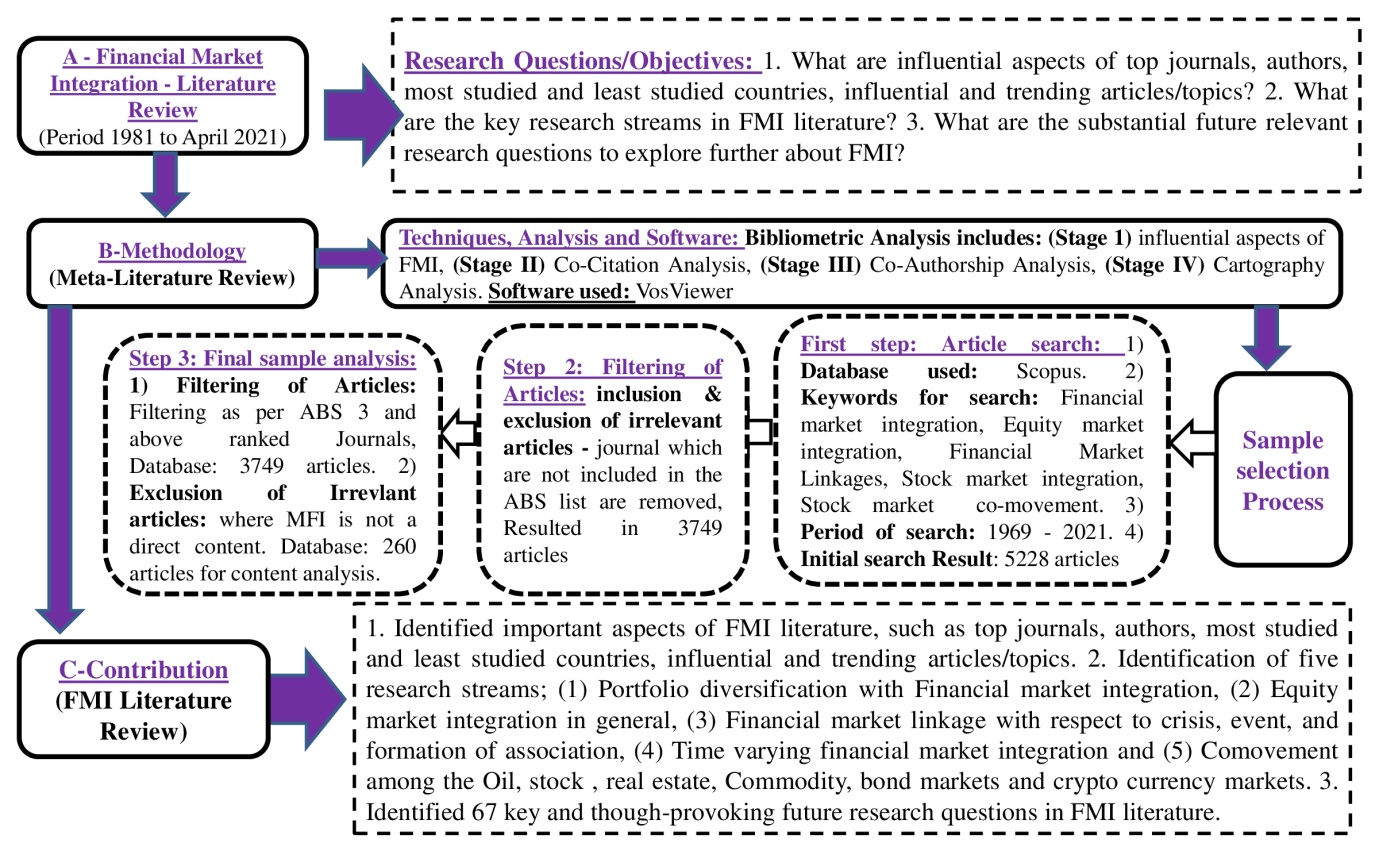
**Table 6: Trending articles**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Rank** | **Article** | **Journal** | **Citations** | **Per year citation** |
| 1 | Lane and Milesi-Ferretti (2007) | *Journal of International Economics* | 1,045 | 74.64 |
| 2 | Ji et al. (2019) | *International Review of Financial Analysis* | 87 | 43.50 |
| 3 | Antonakakis et al. (2013) | *Economics Letters* | 205 | 25.63 |
| 4 | Maghyereh et al. (2016) | *Energy Economics* | 125 | 25.00 |
| 5 | Dimitriou et al. (2013) | *International Review of Financial Analysis* | 167 | 20.88 |
| 6 | Ghosh and Kanjilal (2016) | *Energy Economics* | 90 | 18.00 |
| 7 | Norden and Weber (2009) | *European Financial Management* | 210 | 17.50 |
| 8 | Hartmann et al. (2004) | *Review of Economics and Statistics* | 257 | 15.12 |
| 9 | Carrieri et al.(2007) | *Journal of Financial and Quantitative Analysis* | 207 | 14.79 |
| 10 | Bekaert et al.(2002) | *Journal of Financial Economics* | 279 | 14.68 |
| 11 | Reboredo (2018) | *Energy Economics* | 40 | 13.33 |

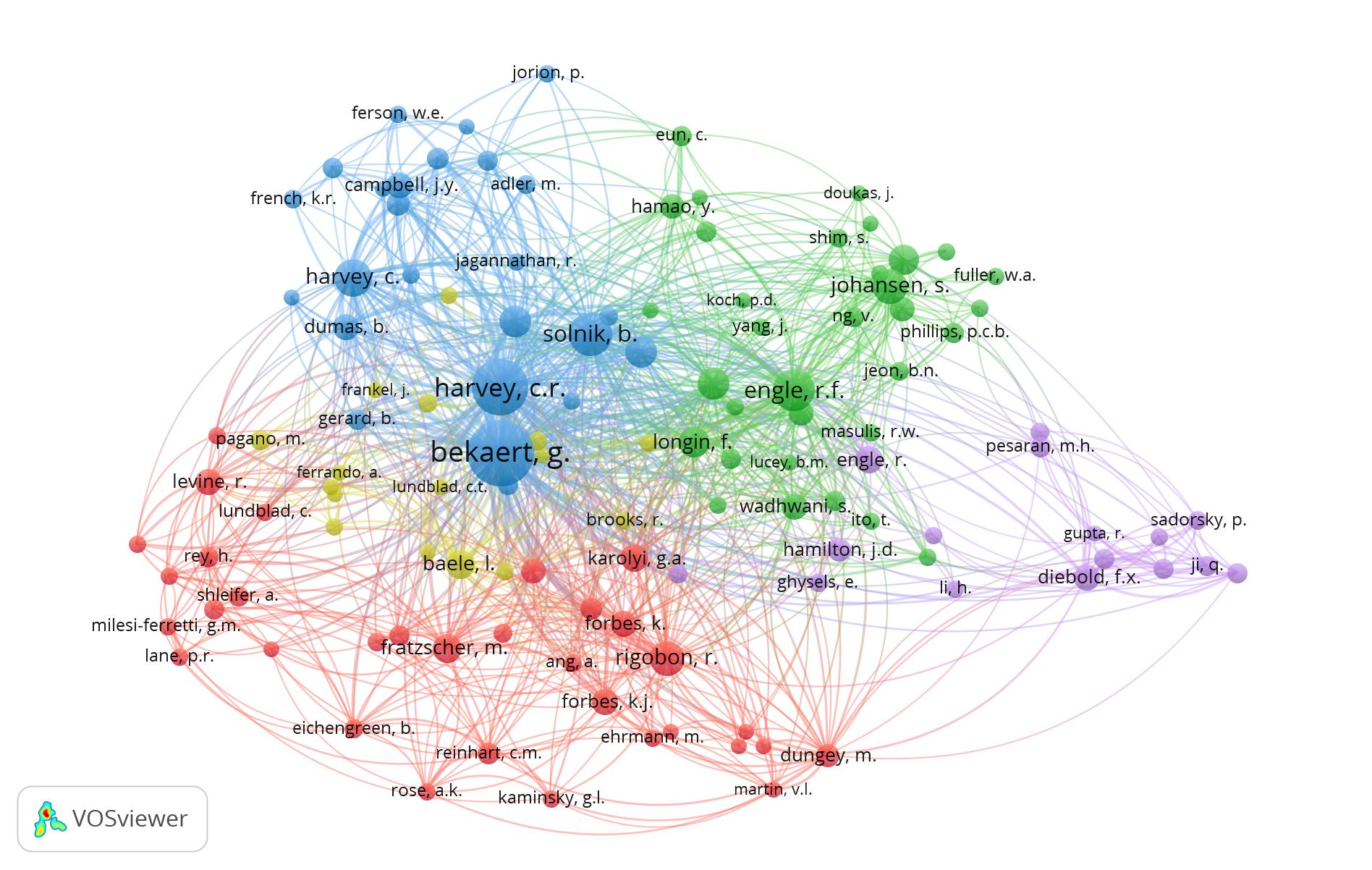
| **Table 7: Summary of key papers in each stream** | | | | |
| --- | --- | --- | --- | --- |
| **Authors (year)** | **Type of paper**  **(empirical or qualitative)** | **Objective/research question** | **Methods (technique/sample of**  **study/data sources)** | **Main findings** |
| **First stream: Portfolio diversification with financial market integration** | | | | |
| Brooks and Negro (2004) | Empirical | * Evidences that the rise in co-movements across stock markets are partially driven by market integration (along with an IT bubble) | * Regression * 41 Developed and emerging markets | * Global integration driven by a recent stock market bubble. * Diversifying across the countries is still an effective option to reduce the portfolio risk. |
| Berger *et al.* (2011) | Empirical | * Are frontier markets integrated with the world market? * Do frontier markets offer portfolio diversification benefits? | * Principal component analysis, Mean-variance frontier analysis * 25 Developed and emerging markets | * The frontier markets remain integrated with the world market but not consistently * The frontier markets are not integrated with world markets results found that the and hence offers a portfolio diversification benefits. |
| Gupta *et al.* (2012) | Empirical | * How is the Indian market integrated with other Asian Markets? | * Cointegration test, DCC-GARCH (1,1) model * 5 Developed and emerging markets | * Weak integration of India with other Asian markets * Portfolio diversification opportunity for the investors at the Indian Market |
| Lee (2017) | Empirical | * Examines intra- and inter-regional portfolio diversification strategies under regional market integration | * Regression Based Model * 64 developed and emerging markets | * Integration among the financial markets at regional level * No diversification benefits for the investors of US or global investors. |
| Reboredo (2018) | Empirical | * How the green-bond and financial markets move with each other? | * Copula models * Bond and financial market indexes | * Weak integration of green bond market with stock and energy commodity markets * Portfolio diversification benefits to the investors in stock and energy markets * Strong integration of green bond market with fixed-income markets * No portfolio diversification benefits to corporate and treasury bond markets. |
| Boako*et al.* (2020) | Empirical | * Examines the time-based connectedness among the equity and commodity markets | * Wavelets Analysis * 9 commodity Markets and 11 equity markets | * Long-term integration among the stock markets returns and commodities returns * Equity and commodity combinations based portfolio improves the performance |
| Cagliesi and Guidi (2021) | Empirical | * How the US market is integrated with emerging and frontier markets? * Do US investors gain from portfolio diversification in emerging and frontier markets? | * ARCH & SWARCH models * 3 Indexes | * Weak integration of US market with Emerging and frontier markets * Better diversification benefits with Emerging and frontier markets |
| Patel (2021) | Empirical | * Are the markets integrated with respect to global financial crises? * Do investors have portfolio diversification benefits? | * Cointegration test and VAR analysis * 10 Developed and emerging markets | * The markets become more integrated after the Global Financial Crisis. * Investors can diversify their funds to other markets as the diversification can result in a better Sharpe ratio. |
| **Second stream: Equity market integration in general** | | | | |
| Bekaert (1995) | Empirical | * How the emerging markets are integrated? * Which factors are the barriers in the market integration? | * Correlation * 23 Developed and emerging markets | * Integration among emerging markets and the US market * Factors, namely poor credit rations, high and variable inflation, exchange rate controls, lack of high-quality regulatory and accounting framework, and limited size of stock markets are important barriers in market integration. |
| Masih and Masih (2001) | Empirical | * Examines the dynamic causal linkages among major international stock markets | * VAR Model and impulse response analysis * 9 Developed and emerging markets | * Strong integration among the OECD market and emerging Asian markets * Leading role of the US and UK markets to other Asian markets |
| Hartmann *et. al.* (2004) | Empirical | * Examines the linkage among the bond and stock markets of G5 during crisis period | * Univariate analysis * 23 Developed markets | * Strong Integration among the markets |
| Voronkova (2004) | Empirical | * Examines the Equity market integration in Central European emerging markets | * Cointegration tests, Error correlation Model * 9 Developed and emerging markets | * Strong and significant integration among the markets * Market integration become more stronger at regional and global level |
| Berben and Jansen (2005) | Empirical | * Does the comovement among the Germany, Japan, the UK and the US markets increased in last 20 years? | * Lagrange Multiplier test, GARCH model * 4 Developed markets and 10 sectors | * Strong integration among the markets UK, US and Germany at Market level and Industry level * Lack of integration of Japan market with other markets |
| Kim *et al*. (2005) | Empirical | * Examines the dynamic nature and determinants of regional and global stock market integration. | * Bivariate ARMA-EGARCH-t test * 17 developed and emerging markets | * Increase in integration with the introduction of EMU * Decrease in the portfolio diversification opportunities |
| Lane and Milesi-Ferretti (2007) | Empirical | * Examines the shift in the structure of external portfolio for emerging market economies | * Correlation * 50+ developed and emerging markets | * Industrial countries are ahead of developing countries in terms of financial market integration with respect to scale of cross-border asset trade |
| Beine*et al.* (2010) | Empirical | * Does the globalisation shows a dark side for international investors with respect to portfolio diversification? | * Regression * 17 Developed and emerging markets | * Increase in the comovement due to global integration shows the dark side of the global integration. * Investors will have more difficulties in having a gains from asset diversification. |
| Aloui*et al.* (2015) | Empirical | * How the sharia-compliant stocks and sukuk in the GCC countries are comoved? | * VAR Analysis, wavelet squared coherency approach * 6 developed and emerging markets | * Negative linkage between two sharia assets * Varying comovement among sharia stocks and sukuk |
| Wu (2019) | Empirical | * Do the East and Southeast Asian markets holds any market integration? * Do the global factors plays any role in this integration? | * Graph Theory, VAR Model * 9 developed and emerging markets | * High level of financial market integration among the ASEAN5+4 stock markets * The governments in East and Southeast Asia region promotes the financial market integration |
| Harkmann (2020) | Empirical | * How the Baltic markets and developed western Europe markets are integrated with each other? | * Johansen cointegration tests, Vector error correction Model * 4 Market indexes | * Long-term and short-term integration among the Baltic markets and Swedish markets * Western Europe develop markets are not integrated with Baltic markets |
| Akbari *et al.*(2021) | Empirical | * How the Emerging markets are integrated with the developed markets in financial and economic terms? | * Correlation, Regression * 41 developed and emerging markets | * Factors which leads to increase and decrease in the integration of emerging markets with the developed markets * The integration is a gradual process and is not driven by cyclical or transitory processes. |
| Jian and Li (2021) | Empirical | * What is the level of systematic risk across the global equity markets with respect to skewness-based market integration approach? | * OLS Regression and GMM * 38 developed and emerging markets | * The Skewness-based integration increased rapidly before the global financial crisis and the EU debt crisis |
| Patra and Panda (2021) | Empirical | * How the BRICS Markets are integrated with US Markets and commodities (Gold and Oil)? | * VAR model 6 developed and emerging markets | * Integration of emerging BRICS with the US markets and commodities, namely Gold and Oil. |
| **Third stream: Financial market linkage with respect to crisis, event, and formations of associations** | | | | |
| Arshanapalli and Doukas (1993) | Empirical | * How the US, UK, Germany, France and Japan are linked with each other with respect to pre- and post-October 1987 period? | * Cointegration tests, Error correlation test * 5 Developed markets | * Increase in the market integration after crisis * Transmission of shocks from one to another markets |
| Caporale*et al.* (2005) | Empirical | * How the east Asian markets are integrated with each other with respect to crisis? | * Wald test, Correlation * 5 Developed and emerging markets | * The markets become integrated with crisis * Portfolio diversification is ineffective in the context of a financial crisis. |
| Bartram *et al.* (2007) | Empirical | * Do the introduction of Euro impacts the dependence among 17 European stock markets? | * Time-varying copula dependence model * 17 developed markets | * Increase in integration with the Euro membership announcement |
| Chesney *et al.* (2011) | Empirical | * Examines the impact of terrorism on the behaviour of stock, bond and commodity markets | * Event-study approach, GARCH–EVT approach * Various bond and equity market indexes | * Non-parametric approach is most suitable methods to examine the impact of terrorism on financial markets * Terrorist attacks have negative impact on the markets, sectors and industries * Portfolio diversification opportunity exist with alternative investments |
| Bekaert *et al.* (2013) | Empirical | * Do the European markets holds financial and economic integration with respect to Euro? * What effects do the EU membership has on the bilateral segmentation? | * Linear regression model * 33 developed and emerging markets | * EU membership has increased the financial and economic integration among the European markets * The integration remains same in the crisis period |
| Wang (2014) | Empirical | * How the markets are integrated with each other at regional level with respect to global financial crisis 2008? | * VAR Analysis, Impulse response analysis * 7 developed and emerging markets | * After the financial crisis the markets become more integrated with each other. * The East Asian markets does not responds to the shock of US Markets after the global financial crisis. |
| Rughoo and You (2015) | Empirical | * Are the Asian Money and Bond markets integrated with each other with respect to crisis? | * Phillips and Sul panel convergence tests, regression * 9 developed and emerging markets | * Decrease in the money market integration after crisis * Bond markets are integrated in both pre & post-crisis period & become more integrated after the crisis. |
| Javed and Virk (2017) | Empirical | * How the European leading markets are integrated in short-term or long-term with respect to pre- & post-euro introduction? | * DCC-MIDAS GARCH Technique * 7 Developed markets | * Increase in market integration after the introduction of Euro |
| Narayan *et al.* (2018) | Empirical | * How the terrorism activities and fear affects the market integration? | * The dynamic conditional correlations model * 8 Developed and emerging markets | * The portfolio decision is sensitive to the domestic terrorism risk * The fear of terrorism is important factor for making international portfolio investment. |
| Dias *et al.* (2019) | Empirical | * Do the Latin American markets shows significant levels of market integration in financial crisis period? | * Gregory-Hansen tests * 7 Emerging markets | * Partial integration among the markets during the crisis and non-crisis periods. * The Latin American markets have a greater impact from the Global financial crisis as compare to dot-com crisis. |
| BenSaïda and Litimi (2020) | Empirical | * How the G10 markets are co-integrated during the Global financial crisis and European sovereign debt crisis? | * Marginal GARCH Model, Vine copula specification * 10 Developed markets | * Strong integration during the Global financial crisis and European sovereign debt crisis |
| Song *et al.* (2021) | Empirical | * How the economic integration affects to the stock market comovement of India with other major Asian markets? | * Cointegration analysis, ARDL method * 9 Emerging markets | * The market integration is positively affected by the economic integration * The interdependence in Asian region is positively affected by the global financial crisis |
| **Fourth stream: Time varying financial market integration** | | | | |
| Jong and Roon (2005) | Empirical | * Do the emerging markets holds time-varying integration? | * Regression * 29 emerging markets | * The emerging markets in Europe, Mideast and Africa are affected by the segmentation of country itself. * Asia and East region markets does not hold time-varying integration. |
| Carrieri*et al.* (2007) | Empirical | * How the emerging markets are time-varying integrated? | * Correlation, Garch Model * 8 emerging markets | * Markets holds time varying integration * Financial markets development and financial policies are important for financial market integration. |
| Cho *et al*. (2015) | Empirical | * Till what extent the portfolios can be sorted based on firm's features which shows time-varying integration and comovement with global and regional factors? | * RS GARCH model * Indexes from Latin America, Europe, North America and the Asia Pacific region and Japan | * The indexes holds the time-varying integration * Contagion effects during the global financial crisis. |
| Lee and Kim (2020) | Empirical | * Do the European countries holds time-varying integration with respect to introduction of Euro in 1999 and banking crisis of GIIPS in 2011? * How monetary drivers are relevant to the time-varying integration with respect to introduction of Euro in 1999 and banking crisis of GIIPS in 2011? | * Dynamic Panel Regressions * 14 developed markets | * Increase in integration among European stock markets after GIIPS crisis of 2010-2011 * Increase in integration of EU Stock markets due to Higher monetary similarities of EU countries * Integration among the EU stock markets increased after the EMU launch |
| Nardo*et al.* (2021) | Empirical | * Do the European markets holds the time-varying integration? | * Time-invariant integration index * 28 developed, emerging and frontier markets | * The integration increases with the crisis * Market size, technological development and political uncertainty drive integration. |
| **Fifth stream: Co-movement among the stock, real estate, commodity, bond, and cryptocurrency markets** | | | | |
| Glascock *et al*. (2000) | Empirical | * How the REIT, bond and Stock returns are integrated? | * Error correction models, VAR Model * 3 Indexes | * Average Integration among REITs and bond market * Strong Integration among stocks and REITs * Decrease in portfolio diversification opportunities |
| Kim *et al.*(2006) | Empirical | * How the EU bond markets are integrated? | * Bivariate EGARCH model * 10 developed and emerging markets | * Strong linkage of Euro zone bond markets with the Germany. * Weak integration of Euro zone bond markets with Czech, Hungary, Poland, and the UK. |
| Delatte and Lopez (2013) | Empirical | * How the Equity and commodity markets are linked? | * Copula Approach * 4 developed markets and 21 commodities | * Existence of Integration between the commodity and equity markets * Integration among the equity markets and commodities increased after the global financial crisis 2008 |
| Kollias*et al*.(2013) | Empirical | * Do the wars and terrorist attacks affects the oil-stock returns relationship? | * Non-linear BEKK–GARCH type models * 4 developed markets | * Somewhat Impact of war on the oil price and stock market relationship * Somewhat Impact of terrorist attacks on the oil price and stock market relationship * Terrorist attacks results in significant diversification benefits for the investors |
| Ftiti*et al.*(2015) | Empirical | * Do the oil and stock market in G7 Countries holds a relationship? | * Wavelet analysis * 7 developed markets | * Comovement in short- medium term (stronger) and long-term (weaker) among the oil price growth and stock return * The oil demand shocks based crisis, influences the G7 Countries stock markets. * These markets were also affected by global oil price shock of 2007-2008. |
| Ghosh and Kanjilal (2016) | Empirical | * How the crude oil price and the Indian stock markets are integrated? | * Cointegration tests, Granger non-causality tests * 1 emerging market and oil indexes | * There is no integration of Crude oil price and the Indian stock market. * The integration among the oil price and market increases after 2009 |
| Antonakakis*et al.*(2018) | Empirical | * Do the volatility spillovers and co-movements exist among oil prices and stock prices of major oil and gas corporations? | * Dynamic conditional correlation Model * 10+ oil and gas corporations | * Increase in the integration between the volatilities of WTI and each oil and gas companies after global financial crisis * The WTI volatility is impacted by the firm level volatility. |
| Ji *et al.* (2019) | Empirical | * How the crypto currency markets are integrated? | * Connectness network analysis Six crypto currency markets | * The two currencies (Litecoin and Bitcoin ) are driving the forces for other currencies. * Bitcoin and Litecoin and the most influential one for the volatility spillover and comovements. |
| Ma *et al.*(2021) | Empirical | * Which factors contributes to the return co-movement dynamics in international commodity markets? | * DCC-GARCH specification, 21 commodities | * The linkage of the energy commodities are stronger as compared to integration among the agricultural or metal commodities. * Financial market information is important contributor to the commodity market movement during crisis period. |

**Table 8 Future research questions**

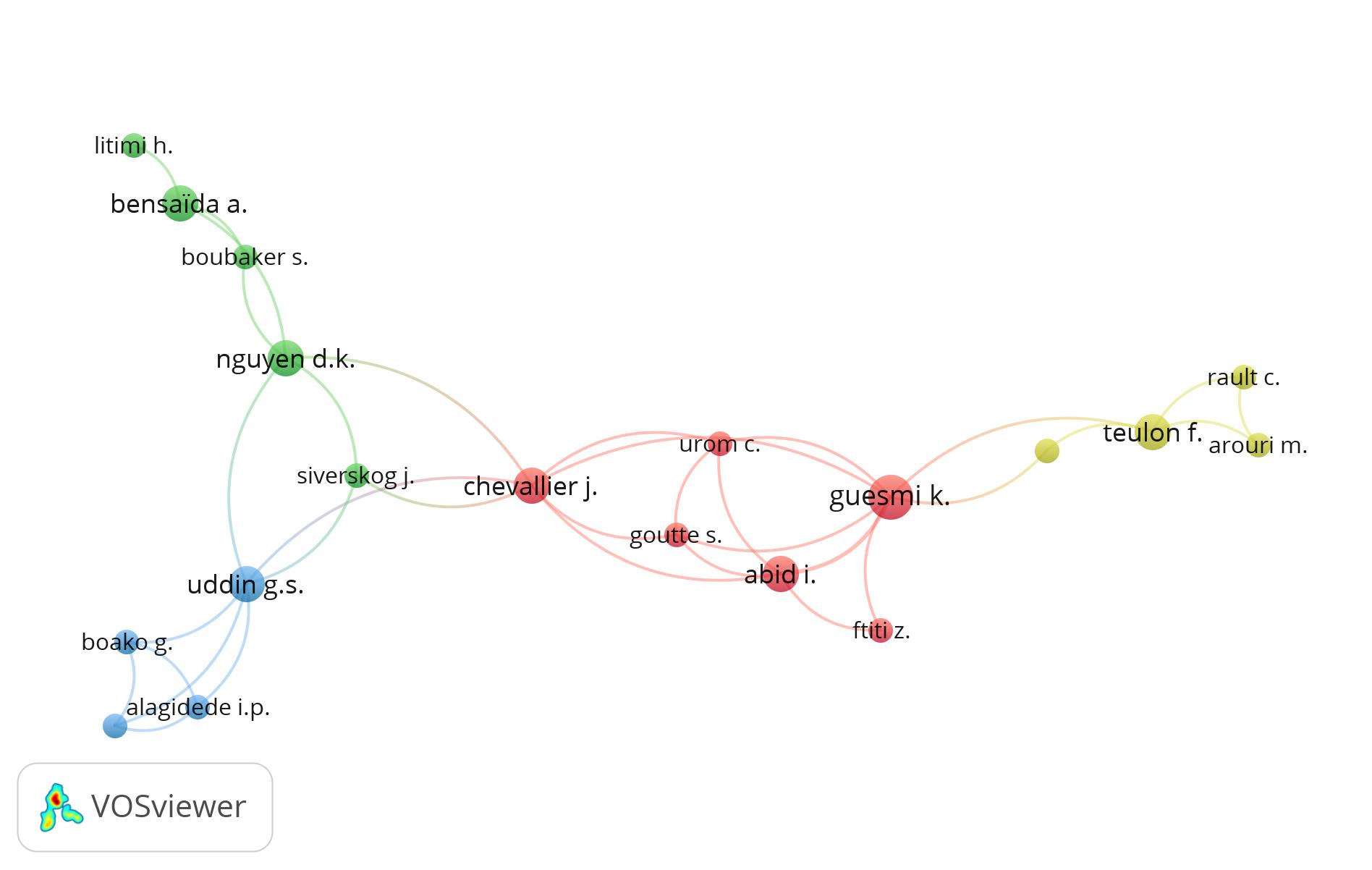
| **Research cluster** | **Q#** | **Research question** |
| --- | --- | --- |
| Equity market integration in general | 1 | What is the relationship between illiquidity premia in diversified portfolios and international financial market integration using higher frequency data? |
| 2 | What is the relation between equity market integration and respective international economic linkages? |
| 3 | What roles do China and USA, and other specific countries play in financial market integration? |
| 4 | What is the nature and source of financial market integration? |
| 5 | Can market integration be quantified? |
| 6 | Is financial market integration affected by business cycles and changes in financial regulation? |
| 7 | How does the integration of developed and emerging markets hold with cross-national differences in macroeconomic variables, religion and culture? |
| 8 | Do the ASEAN markets and other specific regions have consistent financial market integration? |
| 9 | How is financial integration related to the structure of trade partnerships? |
| 10 | What are the causes of the positive association of trade partner concentration and financial integration? |
| 11 | Why the within integration of the markets is poor? This study can be conducted on the financial markets on one single country. |
| 12 | Do economic factors lead to shifts in market integration? To what extent is this particularly true for regions, such as Latin America? |
| 13 | Are there any non-linearities in the market integration process? |
| 15 | Are markets integrated with respect to cross-listed stocks? |
| 16 | Do the economically, geographically, institutionally, or culturally closer markets have more co-movement? |
| 17 | What role does the topological structure of financial networks play in determining cointegration during crises? |
| 18 | How does the isolation from contagion effects in regional and business-cycle synchronization of inter-regional capital allocation affect global banks’ capital allocation strategies? |
| 19 | Does the market integration exist when the global managers make up a small share of two or more markets? |
| 20 | How does integration differ for emerging markets and frontier markets? |
| 21 | What factors drive the country-specific risk in investment? |
| 22 | Do the markets manifest long-run co-movement? (multivariate analysis) |
| 23 | Are equity or money markets linked across countries? |
| 24 | Are there any potential benefits of accounting for persistency of price changes in financial markets? (frequency domain methods.) |
| 25 | Are international equity markets integrated? |
| 26 | High frequency data analysis of integration applying wavelet approaches, multivariate approaches |
| 28 | What cause the Information trading and liquidity trading on order flow shocks? |
| 29 | Do the corporate information and liquidity trading hold interdependencies? What is the effect of such interdependencies on the order flow imbalance? |
| 30 | Does GDP per capita and other macroeconomic variables condition the explanatory power of market integration? |
| 31 | Does the international financial integration affect macroeconomic performance? |
| Financial market linkage with respect to crisis, event, and formation of association | 32 | Is the equity and bond markets are integrated? Performing the portfolio analysis in periods of extensive quantitative easing use. |
| 33 | Which factors lead to increase in co-movement and integration? |
| 34 | Do the qualified domestic and foreign institutional investors programs affect to the financial market integration? |
| 35 | Is there any relationship between financial market linkages and business cycle synchronization with international-level events? |
| 36 | Do the institutional reforms taken to reduce trade barriers affect to the capital market integration? |
| 37 | How is integration between developed and emerging or frontier markets impacted by extraordinary events or crises? |
| 38 | Do countries and regions co-move between market returns, implied volatility, and policy uncertainty? |
| 39 | Do the regional economic integration schemes affects the stock market integration? |
| 40 | What leads to crises-country heterogeneities in response to the financial crises |
| 41 | Are the Baltic markets which have joined the Euro area co-moving more closely to the Euro-area stock markets? |
| 42 | Do financial shocks and their interactions affect the time-varying risk preferences of investors? |
| Time varying financial market integration | 43 | How do systematic events or contagion occurrences impact optimal portfolio design? |
| 44 | Do the bond and stock market holds the time-varying integration with each other at firm level?????? |
| 45 | How does sentiment condition co-movements? |
| 46 | What is the nature of time-varying integration at industry or firm levels? |
| 47 | What drives time-varying integration at industry or firm levels? |
| 48 | Do the changes in oil prices impact integration? |
| Co-movement among oil, stock, real estate, commodity, bond and crypto currency markets | 49 | Is there any linkage between gas oil and Brent crude oil futures contracts post- 2002 period? |
| 50 | What are the regional differences in the linkages of gas oil and crude oil futures contracts? |
| 51 | How to perform the forecasting of optimal weights and hedge ratios using out-of-sample for oil and gas stock markets? |
| 52 | What impact does the common drivers of stock and oil prices makes on the hedging effectiveness of risk management strategies? |
| 53 | Do the oil and stocks price have consistent integration? (Using asymmetric models or cyclical structures) |
| 54 | Do the commodity and stock prices have consistent integration?—in short- and long-term? |
| 55 | Are there any linkage between real estate and stock markets in short-and long-terms? |
| 56 | Does international diversification affect asset pricing and systematic risk? |
| Portfolio diversification with Financial market integration | 57 | Is the international portfolio diversification always beneficial in terms of risk and return? |
| 58 | How does growth of tail risk in one market exacerbate systemic risk in another? |
|  | |



**Figure 1.** Outline of methodology



**Figure 2:** Results of co-citation analysis



**Figure 3**: Co-authorship analysis with *VOSviewer*. The minimum scale for this analysis is three co-authored papers with 130 citations (author calculations).



**Figure 4**: The figure shows the cartography analysis through *VOSviewer*.

**Figure 5**. Growth in FMI literature 1981–2021. The figure shows the distribution of 260 articles per year, and each research stream, author's calculation.