Linkage Dynamics of Sovereign Credit Risk and Financial Markets: A Bibliometric Analysis

Abstract

The manuscript aims to perform a study on evolution of academic literature revolving around the linkages between sovereign credit risk and financial markets through comprehensive bibliometric perspective. The dataset for the study has been extracted from the two relevant databases: 'Web of Science' and 'Scopus'. The manuscript covers basic quantitative analysis of textual data resulting in the publication growth, productive authors, core journals, top cited authors, citation analysis, country wise analysis and dominance index of authors. The analysis is further accompanied with Network graphs that have been used to delineate the logical interconnections between sovereign credit risk and financial markets. The study found that the financial association of sovereign credit risk has been studied extensively with stock markets but its linkages with other financial markets such as forex, Bitcoins, sovereign bonds, agri and non-agri commodities, and crude oil is less explored. The study also found that in recent years, academician's focus has been shifted to exploring sovereign credit risk Spillover and reverse Spillover linkage with crude oil and renewal energy resources. Exploring these linkages with advance econometric models can be more helpful in framing the economic, financial, and energy policies for the countries significantly depending on oil. The study found that there is need to shift the focus on sovereign credit risk linkage to ESG, Green Bond, Climate Finance, etc.

Keywords: Bibliometric, Bonds, Commodity, Crude Oil, Financial Markets, Forex, Sovereign Credit Risk.

JEL Classification:

1. Introduction

In the past five decades, the worldwide economy has encountered four waves of debt accumulation, of which three has ended up in well-known financial crisis in many emerging and developed countries. The first wave started with Government Borrowing by Latin America and Low-income sub-Saharan African Countries which spanned from 1970 to early 1980; the second wave started from the 1990s with heavy borrowings by Banks and corporations of East Asia Pacific and government of Europe and Central Asia, which lasted till early 2000s. The third wave ended up in the global financial crisis in 2007-09.[1] Apart from these global waves, there have been many national debt accumulation episodes that have resulted in a financial crisis, followed by elongated periods of deleveraging (Reinhart and Rogoff, 2009). The studies have summarized different financial crisis episodes, where the government has been the primary source of shocks. The studies find that the countries deeply in debt; slipped in trouble by facing a crisis of confidence of investors implying increased levels of sovereign credit risk. The debt fragility of some key nations brought many more countries to collapse. The linkages between the countries exist owing to macro-economic factors that act as carriers for these shocks. These determinants are categorized into domestic and global factors that can be driving these linkages. Studies have proved the role of domestic and global factors. Yorovaya et al. (2015) have proved a significant role in regional information transmission than inter-regional transmissions in the volatility of an economy. In contrast to this, Rodrigues et al. (2015) found that more than half of the country's total variance is explained by across country shocks rather than idiosyncratic shocks. While Sabkha et al. (2019) says the explanatory power of variables keeps changing across countries and over different time frames or regimes. An increase in explanatory power of sovereign credit risk not only results in increased risk premium, but it may worsen the situation by spilling over the increased risk premium to other macro-economic parameters. Hence, the sovereign risk becomes a critical determinant for macro-economic dynamics, and it also impacts the economic activities and stabilization policies of regulators (Corsetti et al., 2013). Notably, any country's financial system is linked to its economic activities, mainly when economic activities are suspended or slow going. Hence, sovereign credit risk (henceforth SCR) has its impacts on the entire financial system channelized through economic activities. For Instance, rising Sovereign Risk is critical for the country's financial institutions as these institutions hold a large number of sovereign securities to meet regulatory policies (Bouri et al., 2020). Thus, the study of SCR and its global linkage dynamics with financial markets can help investors frame their portfolio diversification strategies and policymakers to take better economic measures.

Initially, credit risk was measured by bond yield spreads, but the rise of the Credit Default Swap (CDS) market has given an alternate method of measuring credit risk (Fonseca et al., 2016). Theoretically, the CDS spread is close to the risk premia of a bond, measured by assuming a risk-free rate of return (Hull et al., 2004). The given argument is supported by researchers who pointed out that most price discovery occurs in the CDS market that leads the bond market (Blanco et al., 2003; Gyntelberg et al., 2018). Longstaff et al. (2005) decomposed default, and the non-default component of CDS spreads and found a significant default risk component. Furthermore, Badaoui et al. (2013) has quantified the liquidity risk component to the extent of 49.91% and default risk to 50% and correlation to 0.09%, whereas in case of bond spreads default risk represents an average of 97.08%. At the same time, they assert sovereign CDS spreads to be a superior proxy for sovereign default risk. It can be inferred here that due to the computation of Bond yield spread, it lacks to represent a sovereign risk as it is based on benchmark rate of return, which can bring biasness whereas CDS Spreads are not based on any

[1] Source: http://pubdocs.worldbank.org/en/377151575650737178/Debt-Chapter-1.pdf

such assumptions. Additionally, due to high liquidity, sovereign CDS is taken as a better alternative to measure Sovereign risk as compared to bond spreads.

The literature on SCR has proved its global linkages with the financial system such as Bordo et al. (2009) have suggested an increase in the country's sovereign risk if its currency depreciates, and it is exposed to foreign currency debt. Bruyckere et al. (2013) has recorded the evidence of contagion between bank and sovereign due to excessive correlations Perego (2020) has highlighted substantial exposure of core and periphery European banks to sovereign debt. Likewise, Singh et al. (2020) has analysed the connectedness between banking and sovereign risk and found the evidence of clustering amongst them in central and peripheral countries of the Euro Area. This outcome is complemented by Hu et al. (2020) by showing positive and negative systemic spillovers from the banks to sovereign ratings of the EU. Lau et al. (2015) have stated that sovereign risk and weak growth prospects to be significant factors that influence stock returns in the banking sector. Euro Area's Bank risk is spilled over from stressed to unstressed countries than its absorption by stressed countries (Breckenfelder and Schwaab (2018). Contrary to this, Allegret et al. (2017) have found negative impacts of the European debt crisis on bank's stock returns are limited to European banks, whereas banks in US are not impacted by its direct impacts. Perego (2020) has proved that, along with the banking system, SCR also impacts stock market returns of different European markets differently. Equity returns are negatively impacted due to the firms' credit crunch as an outcome of sovereign shock. Oshiro and Saruwatari (2005) have used equity price information to quantify sovereign risk, which implies that the movement of transmission can be another way from equity to sovereign risk. Recently, Andreou et al. (2020) outlined the influential role of SCR on the abnormal returns earned by global equity fund investments and proved the superior performance of foreign investors in Emerging markets than domestic ones.

Over the periods, researches have linked SCR with commodity and energy market and proved the significance of commodity markets for sovereign risk. Oil price and its fluctuations are crucial determinants for sovereign debts (Chuffart and Hooper, 2019). There can be an improvement in fiscal stability with higher oil prices in case of oil-producing countries (Wegener et al., 2016) and little or no effect on the sovereign risk of countries with high sovereign wealth funds (Naifar et al., 2020). Pavlova et al. (2018) has found the shreds of evidence of 4%-31% directional spillovers from crude oil to credit default swap of oil-exporting countries. Bouri et al. (2018) has outlined that oil exporters are more sensitive to positive price shocks whereas sensitivity of importers is high towards negative oil shocks. Bouri et al. (2020) showed the directional spillovers from oil returns and oil volatility to MENA countries' sovereign risk in a short period.

Interestingly, country-specific factors are partly determined by global factor variations. Separating the impact of country-specific factors from common regional factors (Kocsis & Monostori, 2016) proves that local fundamentals have a more significant role than global factors in explaining CDS spreads. Another version of research recorded global factors impact both countries in a similar way relative to domestic factors checked for Russia and Venezuela (Chuffart and Hooper, 2019). Numerous domestic factors such as GDP, Inflation rate, Net exports to GDP, Political factors, Foreign investments, terms to trade (Fong et al., 2018; Hilsher and Nosbusch, 2010; Pavlova et al., 2018) and global factors such as VIX, MSCI World Index, MOVE, T-bill rates, WTI (Lahiani et al., 2016; Pavlova et al., 2018; Longstaff, 2010) have been found to drive the shocks between SCR and financial markets.

Regime shifts in CDS dynamics indicate a shift in investor's perception and the reactions are found simultaneously in many other countries in all the financial assets such as forex, stock, and bonds. In 2018, Foroni et al. analysed the pass-through from sovereign default risk to

exchange rates using a new model based on term structures of CDS and recorded improvements in forecasting accuracy by its inclusion. Hui and Fong (2015) highlighted that in short-run exchange rates changes drastically due to SCR in developed countries that leads to high price deviations from its long-term equilibrium. It is also stated that the injection of dollar liquidity after the global financial crisis resulted in disproportionate benefits to countries that are exposed highly to the USA through trade and other financial channels and have opaque assets with high illiquidity (Rose and Spiegel, 2012). Gumus (2011) mentioned that exchange rate policy, i.e., fixed or floating, also impacts sovereign credit spreads. Considering the actual exchange rates, countries with free float exchange rates would not face high spreads, but when the fixed rates are announced, these results in lower spreads than intermittent or flexible policy announcements.

It is apparent from the literature examination that SCR is connected with all other financial markets/assets either directly or via different channels. The studies of SCR are mainly concentrated towards the USA and European countries owing to major global Financial crisis being initiated in these regions. Nevertheless, these connections are time-varying and also different for a different set of countries. Owing to the time-varying role of SCR, there is a need to study this concept time and again to secure the interest of associated stakeholders such as the government, Banking sector, Regulatory Authorities, Investors and financial system as a whole. The past studies have argued the intensity of connections between financial assets and SCR increases amidst crisis, hence justifies studying the relations at the time of the global financial crisis and European Sovereign Debt Crisis. There is room to further identify these linkages due to a continuous increase in total global debt to its peak and further rise expectations. Notably, Total Debt in many countries has crossed its GDP, for instance, Japan, USA, Italy, who had already crossed their debt to GDP above 100%[2]. Such situations raise questions on debt dynamics and creditworthiness of borrowers and can have a considerable impact on the SCR of respective countries. Hence, it is crucial to understand the linkages between SCR and other financial markets. Though these linkages have been recorded in existing literature, knowledge of its evolution and scope of further research has motivated us to do a qualitative and perspective bibliometric analysis.

To study the literature evolution of linkages between SCR and financial markets, we perform a quantitative analysis of academic literature's textual data. Bibliometric Analysis is a quantitative analysis of the research area that investigates current patterns in the literature regarding the specific area and helps uncover new research opportunities (Muhuri et al., 2019). In recent times, numerous studies in finance and economics have provided an outline and structure for diverse topics such as volatility spillovers in financial markets, financial risk, Behavioural Finance, Green Finance. SCR and financial market linkages need to be explored to increase implications for various stakeholders, as mentioned above. Quantitative analysis provides a general outline and structure to the topic and makes elementary identification of ideas simpler. In addition to quantitative analysis, we also have reviewed a few studies based on top authors and top-cited articles to come up with future research opportunities in the given area. This will also help identify untapped areas that need further exploration.

The remaining paper is organized as: Data collection and methodology used is mentioned in section 2. Detailed bibliometric analysis is done in section 3. Section 3 describes visual maps that include conceptual maps and Topic Trend for a better understanding of linkages. Section 4 conclude the study.

[2] Source: data.worldbank.org

2. Data Collection and Methodology

A bibliometric portfolio must include every published article for a given research area. The extraction of the publications is made, keeping in mind all the dimensions explored for linkages between financial markets and SCR. To begin with our research, we relied on two central databases for our primary dataset, 'Web of Science' and 'Scopus.' Both databases provide access to peer-reviewed articles and serial publications. Owing to their access to different sources and considering comprehensive coverage, we root out datasets from both the databases. Notably, we have used 18 keywords to include all possible papers in our search results. To associate keywords with each other and obtain articles related to our requirement, we have made use of Boolean operators "AND" and "OR." The keywords used for search are ("Country Risk" OR "Sovereign Credit Risk" OR "Sovereign Debt" OR "Sovereign Default" OR "Sovereign Credit Default Swap" OR "Sovereign Bond Yield") AND ("Stock Market" OR "Bond Market" OR "Foreign Exchange" OR "Commodity" OR "Energy" OR "Oil" OR "Natural Gas" OR "Biofuel" OR "Carbon" OR "electricity" OR "Petrochemical" OR "Coal"). As one can observe, many "OR" combinations have been worked out with Sovereign credit risk, as different proxy indicators have been used in various manuscripts that, in particular, deal with sovereign credit risk. Thus, to make the research more holistic, we have included all those bunches of keywords. Moreover, the "OR" combination amongst the financial markets includes the research manuscripts where financial markets have been studied in the backdrop of sovereign credit risk. Notably, "OR" inclusively includes the "AND" combination, so the research manuscript will also include the indirect influence of financial markets on sovereign credit risk. The keywords used are selected based on an initial literature review done on the topic.

Our initial search results provide us with a list of 305 documents on the Web of Science (WOS), further refined on WOS categories of 1) Economics 2)Business Finance 3) Business 4) Management 5) Energy fuels and 6) International relations. Further, the results are refined by documents that include Articles, Early Access, Review, Proceeding papers. After refining the search, we have got a final list of 248 documents from WOS. Using similar keywords combinations on Scopus resulted in 651 documents, which has been further limited to the subject area: 1) Economics, Econometrics, and Finance 2) Business, Management, and Accounting 3) Social Sciences 4) Energy. After that, more filtering is done based on Document types with the inclusion of Articles, Conference Paper, and Review. Thus, we limit our source type to Journals and conference proceedings. The outcome gave us a list of 524 documents. For the analysis, the lists of documents from WOS (248) and Scopus (524) is merged in one. Finally, we left with an exhaustive list of 580 entries with the removal of duplicate entries. The study further uses the R's "bibliometrix" package to perform the bibliometric analysis wherein interpretations are drawn with tabular data, network graphs, and conceptual graphs. Bibliometric package enabled us to have conceptual maps such as Factorial maps, thematic evolution maps, trend graphs, social collaboration networks, and a world map that helped us estimate the social interactions between various authors, countries, and keywords. The intellectual structure further provides insights into co-citations of authors and papers.

3. **Bibliometric Analysis and Discussions**

This section deals with the discussions of bibliometric results. In this section we have analysed the Publication growth, Core Journals, top authors, country-wise analysis, keyword analysis,

Author dominance analysis, and top-cited papers. In addition to this, network graphs and conceptual maps are also shown for clear visualization and understanding results.

3.1 Publication Growth Analysis

Descriptive statistics given in Table 1 shows that Sovereign credit risk is first studied in 1976. From the year 1976 to 2020, the area of SCR is studied from different perspectives that include its nature, determinants, contagion, and spillovers to and from different markets, etc. A review of the literature of publications by top authors and the highest citations is given in the next sections. We have considered 580 documents covering SCR and its linkages with other markets, to which 1146 authors have contributed. There are 126 single-authored documents, whereas 1020 authors worked in collaboration with other authors. Figure 1 depicts the annual scientific production in the area of sovereign risk and describes the area has gathered researchers' attention in the latest years. This growth has gained momentum from the year 2005, and most of the work is concentrated between the years 2012 to 2020. 85% of the total work in the given area has been done after the year 2010, and approximately 60% of it is conducted in and after the year 2015. The growing interest of academicians in this field may be attributed to default events such as the Global financial crisis (2008), European debt crisis (2012), and other such crisis such as the taper tantrum episode (2013), Oil crisis (2014) and china's currency devaluation (2015). An increasing number of studies in recent times signifies its increasing role and implications for various system stakeholders. The area of SCR is being considered more significant after the global events demonstrated the shreds of evidence against sovereign creditability. Year 2016 has witnessed significant work done towards SCR and has maximum publications to the count of 72, followed by the year 2017 (69) and 2019 (65). Year 2020 has shown 45 publications, but this data is gathered on 27th of July, the number may spike in remaining months of the year.

Table 1: Descriptive Statistics

Description	**Results**
MAIN INFORMATION ABOUT DATA	
Timespan	1976:2020
Sources (Journals, Books, etc)	289
Documents	580
Average years from publication	5.84
Average citations per documents	10.15
Average citations per year per doc	1.478
References	23007
DOCUMENT TYPES	
article	537
article; early access	2
conference paper	19
review	22
DOCUMENT CONTENTS	
Keywords Plus (ID)	952
Author's Keywords (DE)	1448

AUTHORS	
Authors	1146
Author Appearances	1354
Authors of single-authored documents	126
Authors of multi-authored documents	1020
AUTHORS COLLABORATION	
Single-authored documents	139
Documents per Author	0.506
Authors per Document	1.98
Co-Authors per Documents	2.33
Collaboration Index	2.31

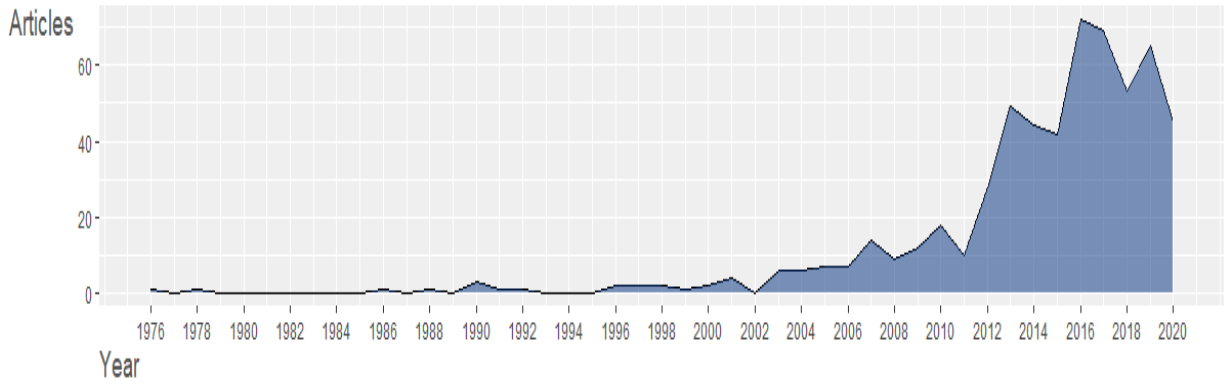

Figure 1: Annual Scientific Production

3.2 Core Journals with Number of articles

Table 2 demonstrates the Top 15 journals that has published maximum articles in the area of linkage between SCR and financial markets. To understand the research done in the given area and its future scope, it is utmost important to know the journals that are publishing good number and quality of articles in the related field in addition to the current dimensions that are being studied. Table 2 shows the journals that are publishing majority of the peer reviewed work in given area. Of total 580 articles considered for this study, 158 articles have been published by these top 15 journals, representing approximately 27.2% of the pool. The Journal of International Money and Finance topped the list followed by Journal of Banking and Finance. Their respective h-index, g-index and m-index has been given that supports high number of publications in respective journals.

Table 2: Top Cited Journals

Sources	Articles	h_index	g_index	m_index	TC*
Journal of International Money And Finance	23	11	21	0.687	466
Journal of Banking And Finance	15	9	15	0.450	409

Economic Modelling	13	6	11	0.666	142
Energy Economics	13	7	13	1	236
International Review of Financial Analysis	11	5	11	0.625	149
Journal of Empirical Finance	11	5	7	0.294	66
Journal of International Financial Markets Institutions And Money	10	6	10	0.545	134
Applied Economics Letters	9	3	5		35
Emerging Markets Review	9	6	9	0.4	250
Journal of International Economics	8	7	8	0.583	218
Research In International Business And Finance	8	2	5	0.181	28
Applied Economics	7	3	5	0.5	26
Emerging Markets Finance And Trade	7	4	6	0.307	43
International Review of Economics And Finance	7	4	7	0.173	67
Romanian Journal of Economic Forecasting	7	3	4	0.333	22

TC*= Total Citations

3.3. Country Wise Analysis

Figure 2 shows the country-wise analysis of research work done in the given area. The dark-coloured countries have produced the highest number of publications related to the linkage of SCR with financial markets instruments, followed by the one with light blue shaded countries. Grey marked area is the area that has not contributed towards this domain of research. The highest contribution in the given area is claimed by the USA with a total of 124 articles, followed by the UK, China, Germany, Spain. The USA and European countries assert ownership of the highest number of researches as a single country and multiple country publications. Considering Total article citations as per country, the USA is the country that has cited the maximum number of articles followed by the UK. The country-wise analysis shows a need to pursue research in this area by other countries to understand better SCR and its linkages with their financial markets.

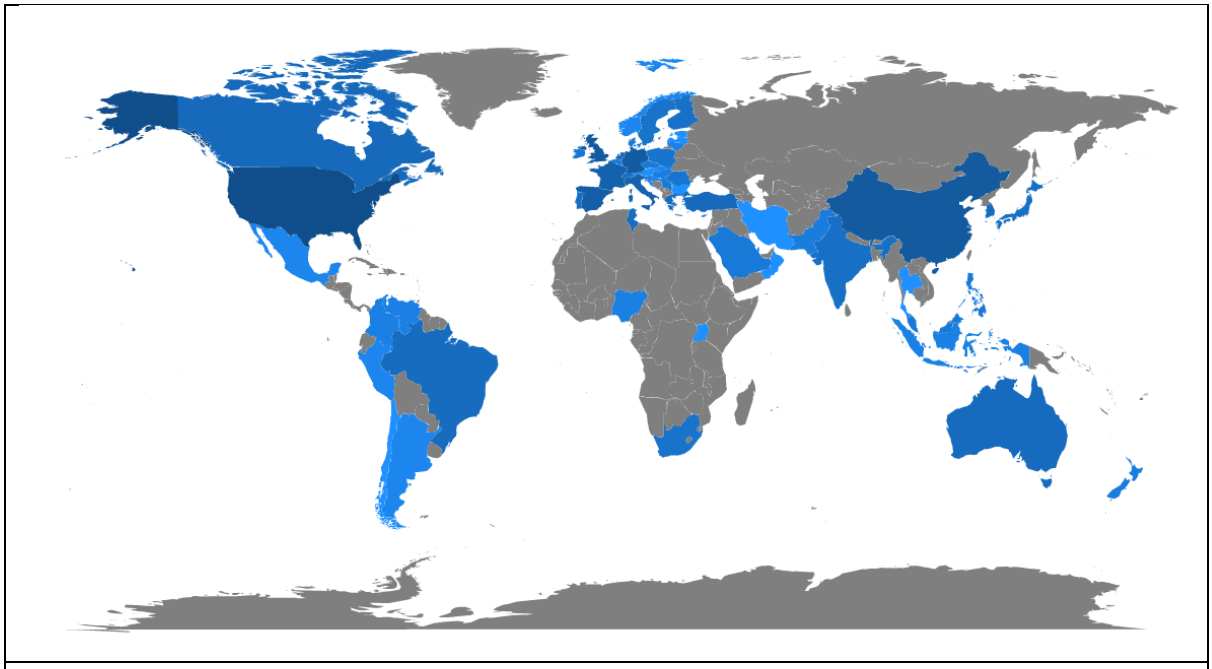

Figure 2: Country Scientific Production

Figure 3 depicts the Country Collaboration Network graph. The circles' size shows the extent of concentration of collaborative publications in that particular geographical area, and the connecting lines show the collaboration of countries in the study. As we can observe, the UK, USA, Tunisia, and France have collaborated maximum for research. The countries with smaller circles and are not connected through lines depict that they have not given due attention to this field. Network shows Japan, Nigeria, Finland, Qatar, Philippines are among those that have not contributed to academic research related to sovereign risk. With the advent of globalization, cross-market investment is growing at a rapid pace. It is further coupled with increased reliance on crude oil by developing nations to meet their energy needs (Behmiri and Manso, 2013). Hence, there is a dire need to explore the linkage of financial assets with the SCR of developing and underdeveloped nations. It would not only require a contribution from academicians residing in developing and developed nations, but also a cross country collaboration with academicians of the developed west to explore the cross-market spillover**.** Thus, the countries lacking research in the area of SCR need to focus their attention on this as it would equip these nations to manage their sovereign risks better.

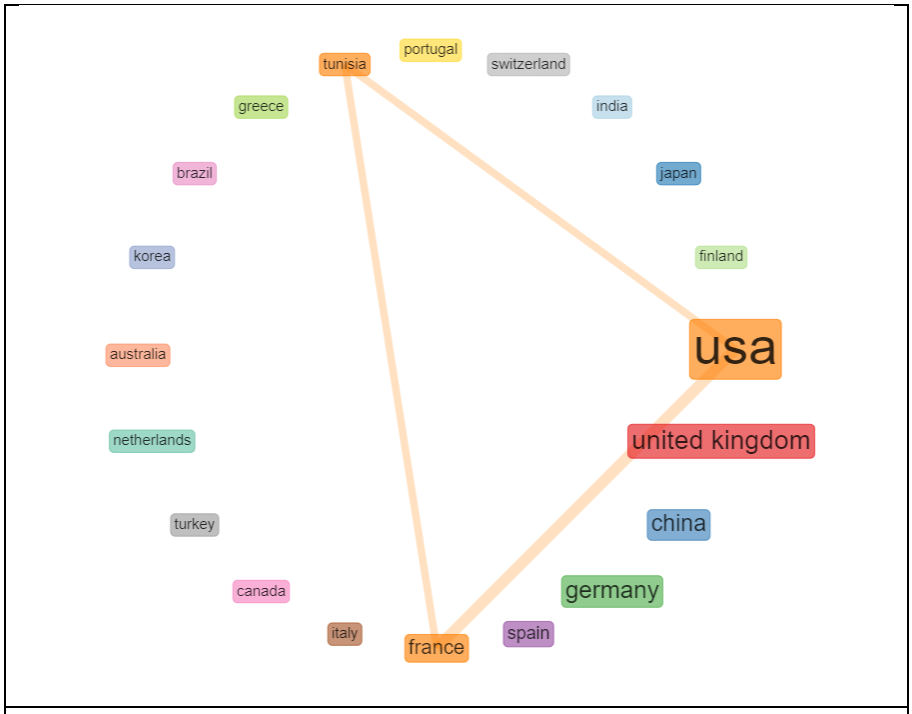

Figure 3: Country Collaboration

3.4 Keywords Analysis

Figure 4 shows the word cloud map based on keyword plus appearing in the papers. Word cloud map highlights the most frequently used keywords in the articles that reflect the research topic. Our word cloud map contemplates the keywords linked to sovereign debts are studied along with risk assessment, contagion, debt crisis, and the stock market. It implies that sovereign risk default and its contagion have been explored to a great extent. Furthermore, risk has been explored at different granularity levels, i.e., from Country-level to volatility and return transmission, covering financial assets such as stock and bonds. However, crude oil, supply, and prices have been studied relatively less, as depicted by its size in the world cloud. Notably assets such as crude oil have emerged an essential part of an investor's portfolio, especially the commodity traders. Amidst the current coronavirus pandemic, where all sovereigns are grappling with their financial statements, oil exporting countries has to face double jerk due to historically low prices of crude oil owing to their dependence on oil revenues. Low oil prices undermine their fiscal stability and spending and can impact these economies. Hence, studying the effects of crude oil and sovereign risk is relevant in today's scenario. Additionally, exchange rate, energy Policies, and interest rates are the keywords that are not studied with SCR as extensively as stock markets are.

Figure 4: World Cloud Map

Noteworthy, apart from the direct linkage of financial markets with SCR, many researchers would have opted for a more comprehensive approach of exploring the relationship. It would thus include a mix of financial assets vis-a-vis a proxy indicator for SCR. Hence, a co-occurrence of keywords must be done to excavate such kind of research. Figure 5 in the appendix exhibit the same, where the node's size depicts the extent of usage of keywords, whereas the thickness of edges shows the combination of keywords used together. Figure 5 reveals that the debt crisis has mainly been used with the Sovereignty, stock market and financial crisis. Risk, price dynamics, investment has been used together multiple times, as indicated by the network graph. The graph also reveals that oil prices have not been connected adequately with SCR and as mentioned in previous paragraph, studying linkages between these two is relevant in today's scenario.

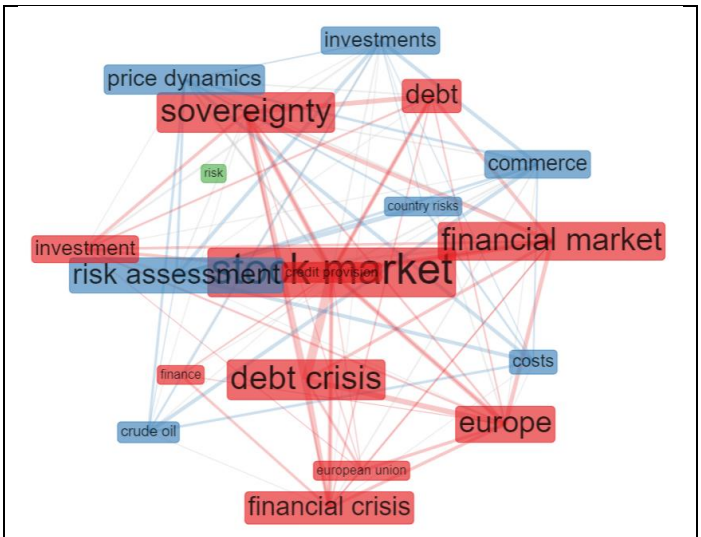

Figure 5: Keywords Co-occurrences

3.5 Author Analysis

Table 3 shows the most productive authors who contributed to academic literature related to the linkage between SCR and financial market. The author's contribution to the given field is measured using "complete count" as well as "fractional count" for the publications. Going by complete count, Hammoudeh S. has authored maximum papers, to the count of 11, in Sovereign Risk followed by Lee C, Li J, and Mensi W with a complete count of 7 each. Where fractionalized count reveals, Hammoudeh S. has 2.90 articles published in the given area. According to Fractionalized articles, Dajcman S has a credit for writing five articles. His rank is 1 in fractionalized articles, which is 5 when we consider complete count. It implies Dajcman has written all the articles as a single author and has given a significant contribution to the area by authoring maximum single-authored articles. In this section, we summarize the publications of the top 5 authors, each as per complete count and fractionalized count. Complete count gives full credit of paper to the author, even if he has co-authored a paper with others. Fractional contribution divides the authorship count between all co-authors and gives only a fraction of one author's contribution.

Table 3: Top Cited Authors

Authors	Articles	Fractionalized articles
Hammoudeh S	11	2.90
Lee C	7	2.83
Li J	7	1.75
Mensi W	7	1.68
Shahzad S	6	1.70
Sun X	6	1.58
Dajcman S	5	5.00
Kang S	5	1.53
Kenourgios D	5	2.50
Sosvilla-Rivero S	5	2.17
Gmez-Puig M	4	2.00
Hassan M	4	1.07
Naifar N	4	1.92
Ngene G	4	1.20
Nguyen D	4	1.08

Hammoudeh S. main contributions to the field include his paper co-authored with Bekiros et al. (2018) that has investigated and found the dependence between European government Bond markets around the European crisis. Another work co-authored with Shahzad et al. (2017) highlighted directional predictability from oil price returns, and uncertainties to sovereign CDS spreads of oil-exporting countries. Mensi W. has co-authored five papers with Hammoudeh S, and their research has examined the relationship of the country's risk rating and equity markets of GCC countries and recorded that inverse relation between the US treasury bond rate and GCC equity markets (Mensi et al., 2017). Very similar research is performed for BRICS countries using the Dynamic Panel Threshold Model by Mensi et al. (2016) and for Turkey by Sari et al. (2013) using ARDL. Mensi et al. (2017) has also proved time-varying volatility spillovers from stock markets to precious metals during the European Debt Crisis. Researches revealed the impact of country risk on energy commodity returns with different intensity and

direction over different times (Lee et al., 2019) and oil price on Banking performance by triggering changes in CAMEL (Lee and Lee, 2019). Contrary to this, Lee et al. (2017) has probed the impact of oil price fluctuations on Country Risk of oil-exporting and oil-importing economies and found a significant impact.

In a study, Dajcman (2013) has rejected the null hypothesis of symmetry between sovereign Bond markets of 8 eurozone countries. He observed that different pairs of sovereign bond markets follow each other closely. In another study, he also observed time-varying co-movement and contagion between stock and sovereign bond markets of eurozone countries (Dajcman, 2012, 2013). Dajcman (2015) examined spillovers between six Euro area countries that were hardest hit by the debt crisis. In yet another study, he focussed on the co-movement between stock market returns and sovereign bond yields of ten Eurozone countries using Wavelet Transform (Dajcman, 2015). Li J has observed the vitality of extreme oil returns for emerging and developed markets, and this vitality differs for different oil importers (Wang et al., 2019). He has also contributed towards assessing external oil supply risk considering country risk and potential oil export capacity of exporters (Yang et al., 2014) and designed a standardized framework to measure the systemic risk of oil imports (Sun et al., 2017). The effect of sovereign bond yields changes on different quantiles of the stock market is analyzed by Ferrer et al. (2019), and they reported a positive linkage between the interest rate and equity markets. A significant impact is also shown for oil price returns on SCR premiums of Venezuela, Mexico, and Russia; however, this impact is little for countries with significant sovereign wealth funds (Naifar et al., 2020).

In 2014, Gomez and Rivero recorded contagion between sovereign debt markets after the European debt crisis. They also have identified the Euro area crisis determinants and underlined that both pure and fundamental factors are the causes of contagion (Gomez and Rivero, 2016). Sojka and Kliber (2019) has investigated the risk transmission between the sovereign CDS and the sovereign bond markets. Kliber (2016) has given a model of the behaviour of return and volatility of Sovereign CDS. In 2019, Kliber analysed the impact of sovereign CDS across markets, i.e., foreign exchange markets, sovereign bonds, and stock exchanges. They also tested the changes in the effects after the ban imposed on the trading of Sovereign CDS.

On careful examination of above literature by top authors, we can find few papers focused their attention towards spill overs between different sovereign markets, between stock market and sovereign risk, oil and sovereign risk has also been studied with different aspects such as its supply and vitality (Wang et al., 2019; Naifar et al.,2020). There are few studies that have focussed on directional predictability from oil to sovereign markets of GCC and other oil exporting countries with focus on very few countries (Shahzad et al., 2017; Lee et al., 2017), supported by country analysis in section 3.3. The research on linkages on oil and SCR is latest topic and needs further examination, especially in the wake of new levels of downfall in oil prices and in the context of ongoing impact of COVID 19 pandemic. The linkage needs to be study using Spillover and reverse Spillover perspective using systemic risk analysis as the risk can be transmitted either directly or through channels. Hence, an examination of systemic Spillover between SCR and other variables like crude oil can be more relevant.

3.6 Author's Dominance Analysis

The index of authors is shown in Table 4. The dominance of the author can be known with the help of h-index, g-index, and m-index. These Indexes are further based on the number of the author's total publications, Citations of author's paper, number of times the author has been a first author or second or third author in a multi-authored paper which influences their dominance index. Apart from the dominant author, it is also interesting to know the author's coupling. In Figure 6, we can find the author coupling that plots author couples together. Hammoudeh and Mensi, Sosvilla-Rivero, and Gomez Puig, Li J, and Sun X are few authors who coupled their research work. Their research work has been dominating the publications in sovereign risk and financial markets in core journals related to the publication of energy finance articles. Noteworthy, Hammoudeh S and Mensi W have their publications in Emerging Markets Review, Applied Economics, Review of International Economics, and International Review of Economics and Finance. Li J and Sun have published their papers in Energy, Energy Policy, Economic Modelling Journals. Sosvilla-Rivero and Gomez Puig's publications are part of Economic Modelling, International Review of Economics and Finance, Journal of International Financial Markets and Institutions.

Table 4: Author's Index

Author Index						
Author	**H_Index**	**G_Index**	**M_Index**	**Tc**	**Np**	**Py_Start**
Hammoudeh S	8	11		296	11	2013
Lee C	3	4	0.75	54	4	2017
Li J	4	7		83	7	2012
Mensi W	6	7	0.857	264	7	2014
Shahzad S	3	6	0.75	72	6	2017
Sun X	4	6		78	6	2012
Dajcman S	3	5	0.333	25	5	2012
Kang S	3	5	0.6	152	5	2016
Kenourgios D	4	5	0.5	155	5	2013
Sosvilla-Rivero S	5	5	0.556	91	5	2012
Gmez-Puig M	4	4	0.333	69	4	2009
Hassan M	2	4	0.286	23	4	2014
Naifar N	3	4	0.6	103	4	2016
Ngene G	2	3	0.286	15	4	2014
Nguyen D	2	4	0.4	31	4	2016

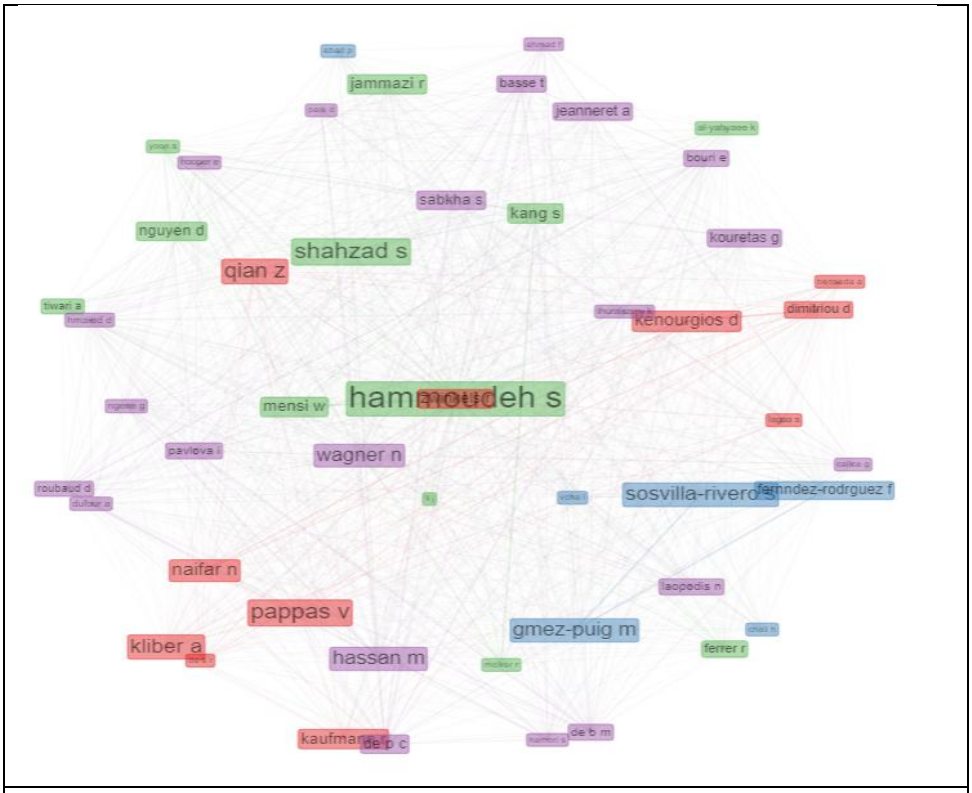

Figure 6: Author's Coupling

3.7 Citation Analysis

We have analysed 15 top cited papers to know the kind of linkages studied for financial markets and methods applied. Papers focusing on linkages have been selected by manual scrutiny out of top 40 cited papers. Top cited papers also included various papers on methodologies proposed to Interest rate structures (Merton, 1974), finding out structural breaks (Bai and Perron, 1998, 2003), etc. These articles have based their work on different models to measure linkages, for example, correlation based models such as FIAPARCH and DCC, Regression based models such as Quantile Regression Method, Pooled OLS, Logit Model etc and Contagion based models such as Generalized variance decomposition. A summary of the papers that have applied these methods to study linkages are mentioned in Table 5 below.

Table 5: Descriptive Statistics of Top Cited Papers

Author Name	Model Used	Model Variation	Variables Considered
Forbes and Rigbon (2002)	Correlation Based Models	Adjusted and Unadjusted Correlation Coefficients	Global factors, country specific factors and other
Engle, R.(2002)		Dynamic Conditional Correlation	Dow Jones and Nasdaq, domestic Stock and Bond; Returns of currencies
Mauro et al. (2002)		Correlation Coefficients	

Dimitriou et al. (2013)		FIAPARCH and DCC	Stock markets
Hilsher and Nosbusch (2010)	Regression Based Models	Logit Model (by Shumway 2001)	EMBI Bond Index, Global factors
Longstaff et al. (2011)		PCA and Cluster Analysis	local economic variables,global financial market variables, global risk premia measures, and net investment flows
Aizenman, et al. (2013)		Dynamic Panel	Tax Base, Public debt to tax base, Inflation, Trade, Foreign reserves, GDP, TED Spreads
Beirne and Fratzscher (2013)		Fixed Effect Model	Public debt to GDP ratio, fiscal balance to GDP ratio, real GDP growth, the current account balance relative to GDP, VIX index
Bekaert G et al. (2014)		Pooled OLS, Factor Analysis	US factors, Domestic Factors, Global Factors, {cross border capital flows, External exposure through trade and financial openness}
Mensi et al. (2014)		Quantile Regression Model	Global Stock markets, WTI Crude oil, Gold Price, VIX, US economy policy uncertainity Index
Liu et al. (2016)		Panel Model	Oil Price and ICRG Ratings of 36 countries
Aloui et al. (2011)	Copula Model	Copula Functions	Stock markets
Diebold and Yilmaz (2009)	Contagion Based Model	VAR and Variance decompositions	Global stock markets

Diebold and Yilmaz (2012)		Generalized autoregressive framework with FEVD	U.S. stock, bond, foreign exchange and commodities markets

Researchers have based their contagion measurements on Correlation based models that shows the pairwise correlations between countries. Using such a model, Mauro et al. (2002) has highlighted frequent sharp changes in bond spreads in current period than past period for emerging markets. Emerging markets are playing crucial role in global growth and are attracting more FDIs from developed countries, resulting in increasing correlations with other countries and making them more susceptible to global shocks. Measuring the correct status of contagion between emerging countries and with rest of the countries and their reverse effects can help in managing the sovereign risk of such economies efficiently. But the linkages of emerging economies are still ambiguous. Contrary to the results given by Mauro et al. (2002), Dimitriou et al. (2013) has recorded no larger dependence between BRICS during bearish markets which exists in bullish time period implying the dependence to be time varying. Likewise, In 2002, Forbes and Rigbon have claimed the linkages between countries during crisis to be interdependence than contagion and mentioned that unadjusted correlation estimates gives biased results when stock markets volatilities are high during crisis. Adjusted coefficients provides more accurate results and even after adjustments correlation coefficients can biased for endogeneity and unobservable aggregate shocks. It can be inferred here that correlation-based models can help in knowing the correlation between a pair of a country. Many advancements of correlation methods have been proposed over time, but these models cannot capture highly irregular and unanticipated incidences that can result in significant structural change. Though Dynamic conditional correlation has been proposed to capture high dimensional system but has been applied up to 100 assets (Engle and Kelly, 2012).

Regression based studies have mainly focussed on the determinants of SCR and highlighted the evidences of contagion between the markets. Studies have outlined sensitivity of financial markets (Beirne and Fratzscher, 2013), Global Risk Premia (Longstaff et al. (2011), high fiscal, current account deficit and sovereign ratings (Bekaert et al., 2014) to be the explanatory factors for such contagion. Volatility in terms of trade for a commodity is another significant variable that explains the Sovereign spreads and their explanatory power changes with volatility of terms of trade (Hilsher and Nosbusch, 2010) along with trade openness (Aizenman et. al, 2013). This signifies the importance of studying the impact of fluctuations in highly volatile commodities on sovereign risk such as crude oil which is considered as one of the vital commodities. Fluctuations in crude oil price can impact the oil exporting economies which are considered as core of global energy markets. Any kind of instabilities in such countries can put global energy security at stake, more particularly for oil importing countries either directly or indirectly via macro-economic channels. In 2016, Liu et al. documented significant impact of oil price fluctuations on country's rating, especially during crisis. Using Copula functions, Aloui et al. (2011) found evidences for strong co-movement between the pairs of BRIC and USA with higher dependence of Brazil and Russia on USA than China and India. They

recorded low probability of simultaneous crashes in emerging markets due to smaller dependence between these pairs during bearish markets than bullish.

Where Regression and Copula methods are dependent on variable ordering, Diebold and Yilmaz (2012) has proposed a new spillover based methodology that is independent of variable ordering and based of Generalized VAR. Their methodology is used to find systematic impacts of cross market spillovers for stock, bond, foreign exchange and commodity markets. Recently, Pavlova et al. (2018) has conducted a study on spillovers from crude oil and macro-economic variables using this methodology but their study has limited countries and number of variables. Their study can be extended by applying GVD model proposed by Diebold and Yilmaz on Emerging and Developed oil dependent countries to differentiate the impacts of spillovers from crude oil to emerging markets and to developed markets.

3.8 Conceptual Structure Map

Conceptual Structure Map exhibits the relationships studied between different concepts. It is made by performing Multiple correspondence Analysis of terms extracted from keywords, tittle or abstract fields. We have segregated the studied concept into four clusters based on the frequency of their co-occurrence in a manuscript. Figure 7 depicts the four clusters of the elements that share common characters. First cluster (Purple) clearly depicts Time series analysis is used to measure contagion of stock markets returns and oil. Few of the studies have reported Crude oil is a major factor that derives the co-movements of international stock markets (Wu et al., 2020). In 2019, Lin et al. highlighted single direction contagion from Brent crude oil to Chinese and European stock markets in irregular events and vice versa. They also found Bi-direction risk contagion but in extreme events. This infers the existence of contagion between crude oil and stock markets returns.

In the second cluster (Green), spillover effects have been studied closely with financial markets which is further linked to oil supply, oil prices and other renewable resources. Such empirical analysis is performed using different variants of regression analysis and keeping global financial crisis as structural breakpoint. For Instance, Zhang et al. (2017) took GFC as structural break and investigated the impact of stock market volatility on crude oil and natural gas market. Contrary to this, Kayalar et al. (2017) has examined the impact of crude oil prices on stock markets indicators of globe as well as exchange rates. They reported the dependency of oil exporters to oil price fluctuations than oil importer who are less vulnerable. It can also be inferred from the cluster that during global financial crisis empirical analysis of price dynamics or investments has been studied for uncertainties. Renewable energy and country are also associated in long and short run (Saidi and Omri, 2020). The cluster lead us to an inference that sovereign markets have been linked with financial markets, but interestingly we could not find much evidences on linkages of Bitcoins with sovereign risk, especially when (Henriques and Sardosky, 2018) proved that if a portfolio contains bitcoins it is ranked highest according to risk adjusted measures. Additionally, bitcoins are being considered as a safe haven for investments along with gold and commodities should be studied for its linkages with SCR (Shahzad et al., 2019). Also, Narayan et al. (2019) has highlighted that bitcoin price growth impacts the growth of inflation, currency appreciation and money velocity reduction. Studying the influence of bitcoins fluctuations on sovereign markets can prove beneficial for banks and sovereigns in managing their foreign currency, particularly for countries with high inflation growth. Apart from bitcoins, crude oil is a commodity that has been studied with stock markets

to a greater extent but not with SCR. Exploring its spillovers with SCR would be beneficial for investments in framing and rebalancing their portfolio, policy makers of major oil exporting and oil importing countries for framing their macro prudential policies and entire financial system as crude oil is a variable that influences all the financial markets.

Third cluster (Red) reflects financial system has been studied with economic growth using macroeconomic factors. Few studies supporting this inference includes; Lee and Chang (2009) who have found the evidences for long run relationship between FDI, economic growth and Financial Development. In 2019, Nasir et al. has argued environment degradation of a country due to development of economic growth, FDI and financial development. Combes et al. (2019) mentioned that economic growth and exchange rates are influenced by direct and indirect financial flows. Besides, Sovereignty is studied closely with exchange rate, stock markets and other financial markets. Likewise, Foroni et al. (2018) has examined the spillover of sovereign default risk to foreign exchange rate. Debt crisis of Greece and its impact on interest rates is also amongst broadly studied keywords. European countries have received extra attention due to Sovereign debt crisis and its contagion to other countries (Keddad and Schalck, 2020). Fourth cluster (Blue) is showing a connection between sovereign markets and renewable energy sources. Use of renewable energy can be helpful for economic growth of a country as well as its excessive use can deteriorate the environment. It is proved by Blancard et al. (2019) that good ESG performance has negative linkage to sovereign bond yield and vice versa. ESG investing can be critical factor in determining the borrowing cost to a sovereign and can impact its economic growth require more attention. Farooquee and Shrimali (2016) has examined government sponsored Forex facility as hedging tool to solve the barrier to market competitiveness of renewable energy in India. The studies in this area have shown concentration towards China, possibly due to one of the top emerging economy.

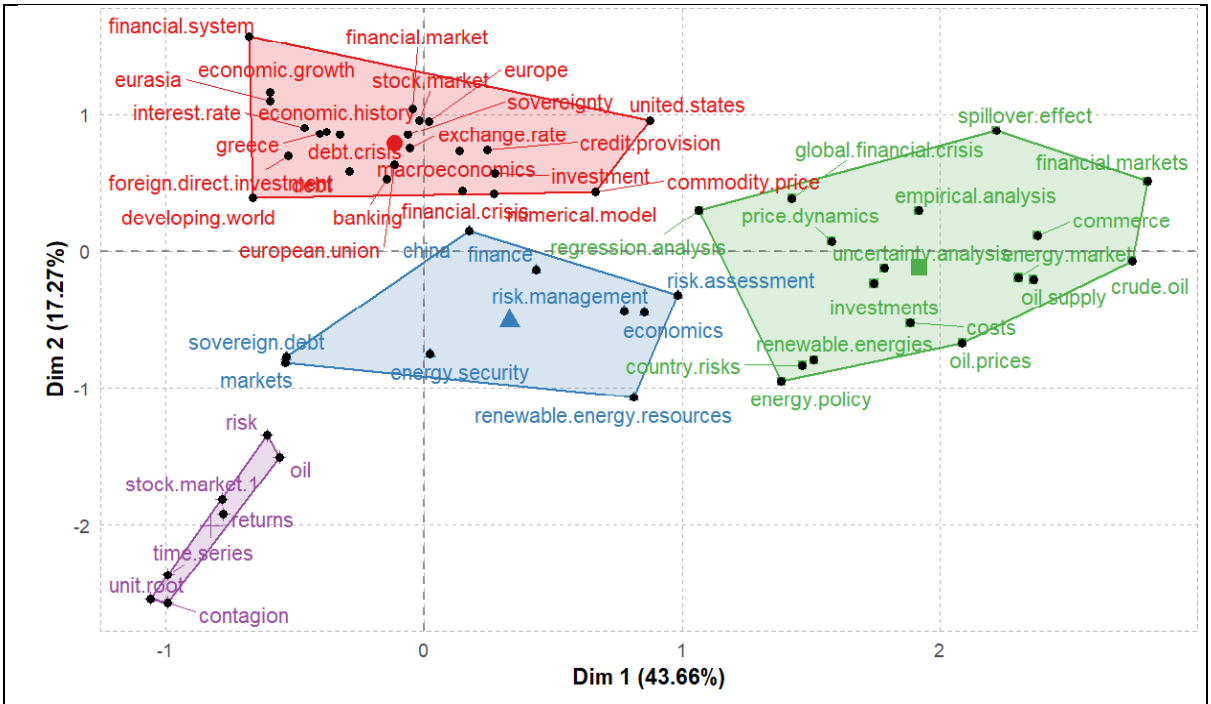

Figure 7: Conceptual structure Map

Apart from above analysis, one common keyword that is getting reflected in most of the graphs is USA and Europe. Global Financial Crisis of 2008 was the largest in history and these shockwaves spilled over from the USA, the epicenter of the crisis, to other countries that puts other countries also in deep stress. Following GFC, European Debt Crisis leads to similar kind

of studies based on European countries with more focus on European countries, using various techniques of regression analysis. Assessment of sovereign risk is an important parameter to forecast sovereign debt cost and its impacts. This analysis highlights the importance of renewable energies, especially crude oil, for economic growth and various other financial markets. As indicated by World cloud (refer Figure 4) and discussed in this section, it is clear that crude oil has widely been studied with stock markets than with bitcoins, forex, crude oil and sovereign markets. Also, it is evident from discussion that relationship of crude oil with other markets is time varying and changes from country to country.

3.9 Thematic Map

Figure 8 shows thematic map that indicates the themes of studied area which clearly indicates stock market is theme that has highest number of topics studied with SCR. For example, recently Sun et al. (2019) outlined the interactions between sovereign CDS, stock and commodity markets. Their result shows that stock market plays dominant role in all phases whereas CDS and commodity markets plays important role during certain period. Bensaida (2019) indicated that good and bad volatilities have different intensities and are time varying, with more transmission of bad volatility during crisis. These time varying relations are studied between BRIC emerging and developed stock markets by Mensi et al. (2017). Apart from domestic equity, Andreou et al. (2020) has studied the effects of sovereign rating upgrades and downgrades on global equity returns of foreign investors. Besides, Bouri et al. (2020) have examined the linkages of oil price volatility and sovereign markets keeping the stock market returns under control. Kablan and Kaabia (2018) has examined transmission channels of European financial crisis to African equity markets and highlighted that along with direct transmission, various macro-economic channels and market channels also contribute to transmission.

Apart from this, thematic map shows price dynamics has also received due attention from researchers. Recently, Lin et al. (2020) has argued greater influence of order flow on price dynamics of low intensity trading environment than high intensity for sovereign markets. Gyntelberg et al. (2018) has interpreted the impact of short selling ban of naked CDS on its pricing and found no reduction in market efficiency i.e. price discovery dynamics are not changed. Risk assessment between various assets and SCR has been focused by taking global financial crisis as structural break. Eijffinger (2012) has recorded risk assessment business models of rating agencies indicating their ratings lagged behind the markets. They also mentioned policy changes to amend the rating agencies. Risk assessment for cross markets has been analyzed by Singh et al. (2020) by considering cross connectedness between sovereign risk and euro area banking and found clustering between sovereigns and banks in Central and Peripheral countries. Similarly, dependence between sovereign risk and implied volatility shocks is measured by Bouri et al. (2018). Apart from these, Investment and commerce are the themes that have been studied but required level of research needs further exploration specifically to sovereign risk and investments. Factor based investing is a relatively a mature subject for equity markets as it is used highly by wealth and portfolio managers to increase their returns, but for sovereign bonds this area is still at its infancy. Factor investing can help in understanding efficient harvesting in risk premia in bond market by identifying the multi factors that contribute to spreads of sovereign securities. Bektic et al. (2020) has mentioned the need of studying further the factors that can influence the returns from sovereign bonds. Maeso et al. (2020) found that factor strategy i.e. carry strategy can generate up to 210 basis point excess over benchmark. Hence, exploring other such factors can lead to an increase in bond returns. Where factor investing is seeking to increase returns, ESG investing is also integrating increasingly with portfolio management. Responsible investing on the part of sovereign may

bring in many benefits to a sovereign such as better cross border investments, increased capital inflows and lower borrowing costs. Recently, Blancard et al. (2019) has analyzed the impact of ESG performance on sovereign borrowing cost in international markets. They recorded lower default risk of country's with better ESG performance and it is social and governance dimension of ESG that has a negative association with sovereign bond yield spreads. Research in the area of ESG Performance and SCR should be further explored.

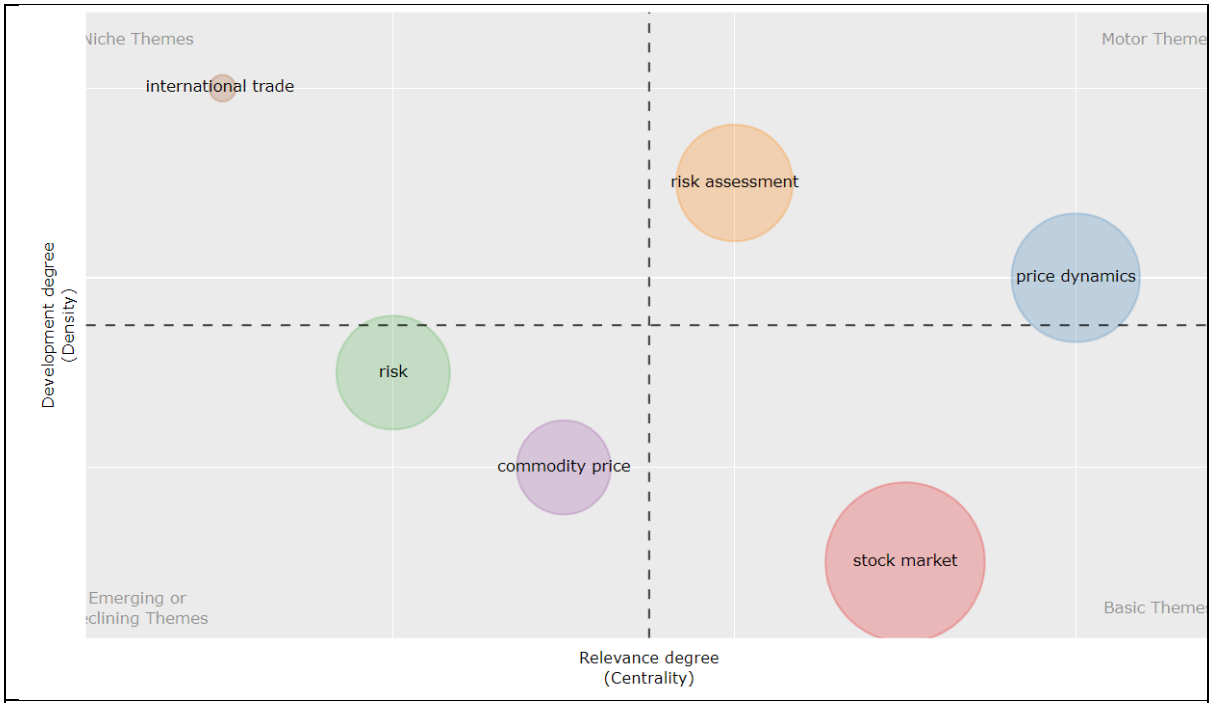

Figure 8: Thematic Map

3.10 Trend Topics

Figure 9 delineates the trending topics over years, log frequency shows limited research in the area till 2013. The studies were limited to capital flow and economic growth. Agbloyor et al. (2014) have decomposed the private flows and proved that private debt flows, FDIand FPI have inverse effect on growth of economy. In 2015, Interest rates and financial markets of Europe and China are taken into consideration (Keddad and Schalck, 2020). In 2019, Neanidis has found the role played by banking supervision in promotion of economic growth by dampening the effects of capital flows. Great plunge in the oil prices in 2014 created a chaotic situation for oil exporters and importers, China being one of the world's highest importer of crude oil has fetched the interest of researchers. Also, Currency devaluation by China during 2015 followed by monetary easing and interest rate cuts added to researcher's interest in China. Following spillover of stress in global economies, year 2016, debt crisis has been investigated considering global financial crisis and SCR for risk assessment of other markets ((Keddad and Schalck, 2020, Sun et al. 2019). The directional spillovers amongst sovereigns and between sovereigns and other countries have proved the internationally diversified portfolios go through systemic risks. In 2017, consideration has been given to macroeconomic factors and price dynamics along with risk assessment of sovereign and stock markets. For instance, Mensi et al. (2014) found dependence of BRICS stock markets over global commodity and stock markets. Abed et al. (2019) has explored financial stress transmission from sovereign markets to financial

markets. 2018 onwards, crude oil price has been studied with high frequency, there are studies focussing on effect of oil price fluctuations on bank's performance (Lee and Lee, 2019), Impacts of Oil returns changes on credit risk of oil exporting countries (Naifar et al. 2020). Similarly, Bouri et al. (2020) has examined the impacts of oil volatility on credit risk of MENA countries where Mei-se et al. (2017) studied the co-movement of gold, silver and oil. Crude oil being the latest concept in trend graph implies that it has important role in economy, principally, for determining the borrowing cost, forecasting banking instabilities and other financial markets.

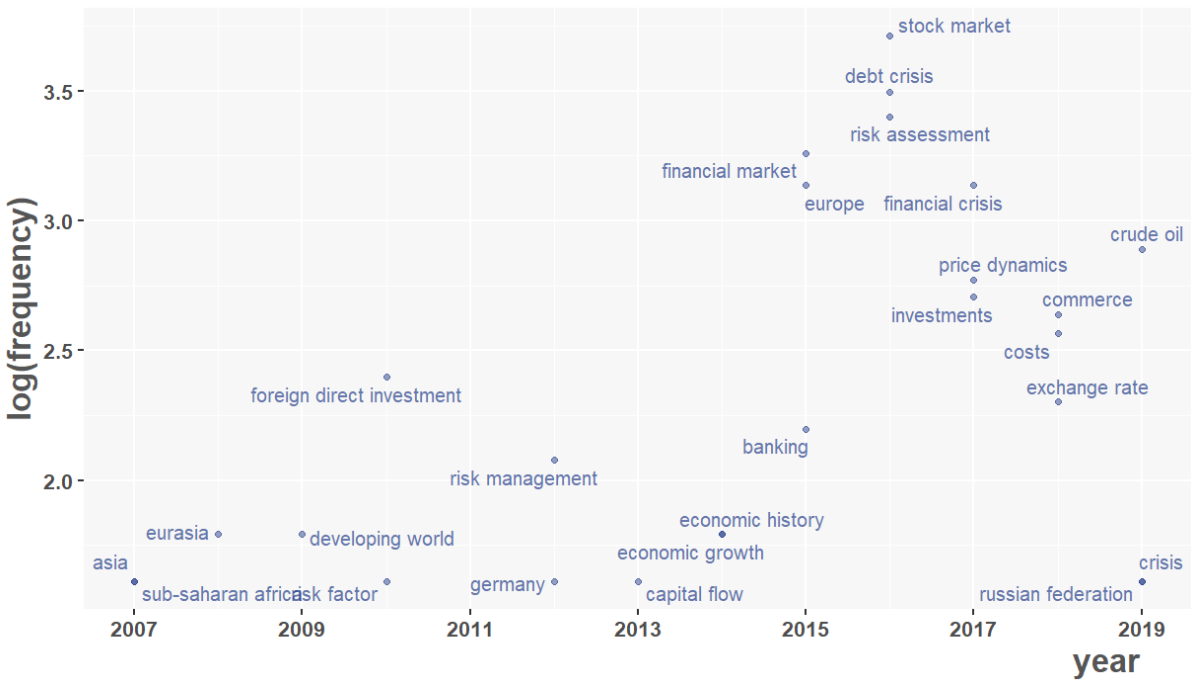

Figure 9: Trend Topics

Recently, due to complete or part suspension of economic activities around the world crude oil price has witnessed an epic oil price breakdown. Crude oil is an international commodity and approximately 60% of the world's oil originates from only 25 oil fields. Additionally, amidst this crisis many sovereigns have to raise additional funds to meet the financial requirements due to suspended activities, lower tax incomes and increased economic burden due to relief packages provisions. Nevertheless, all countries are grappling with their financial statements amidst the corona pandemic, yet oil exporting countries have to struggle more due to double jerk by historically low oil prices. Low oil prices undermine the fiscal stability and spending of most oil-exporting countries. In the first quarter of the year 2020, Saudi Arabia recorded a Budget Deficit of $9 billion, with oil revenues down by 24 percent on the back of the oil price collapse. United Kingdom, one of world's significant oil producer, also endured a drop in oil revenues due to incredibly unstable oil prices amidst coronavirus pandemic. For Russian economy also revenues from oil and gas trade crumbled by a larger part. In short term, this brunt, of falling prices of oil below breakeven, can be rescued by national wealth funds but persistence of low prices can bring these oil dependent countries under tremendous pressure. At one side where countries are raising funds through new issues, dwindling fiscal stability of oil producing sovereigns can create a suspicion regarding their credit risk. In this scenario, it becomes imperative to understand the SCR of oil producing countries and also how is it impacted by crude oil price fluctuations. Also, the reverse spill overs from SCR to crude oil

can be helpful in framing the strategies for international energy markets to protect them against fluctuations in sovereign risk.

4. Conclusion

After the worldwide events of Global Financial Crisis and European Sovereign Debt Crisis, sovereign default risk has started puzzling the researchers and this area has fetched the interest of many researchers. With the advent of ongoing corona virus pandemic that shook the financial stability of all economies and resulted in significant shock for many financial markets, studying the linkages between SCR and financial markets is utmost important. This study has made an attempt to explore the existing studies that has paid attention to SCR and financial markets. Our analysis has led us to the conclusions that studies in the area of SCR started picking up in the year 2005 and gained momentum from the year 2012. 80% of the total work in this area is done after 2010. The country wise analysis shows that highest number of publications in the given area are claimed by USA followed by UK and other European countries. The study shows that the Emerging markets need to focus on the study of their SCR. Keyword analysis reveals Global financial crisis, sovereign debt, Risk, Stock Market and Contagion are the highly used keywords. The keywords analysis has stressed highly upon stock markets, sovereign debts, risk assessment, and contagion, which implies contagion between sovereign risk and stock markets is focussed more for assessing the risk to sovereigns. In addition to descriptive analysis, the study has showed us various perspectives that are not considered much in the given area. Finding from the study outlined the relevance of exploring the linkages between Crude oil price fluctuations and SCR. Crude oil is a strategic and most volatile commodity used by all economies, with its exploration being done only in part of the world, oil exporting countries has heavy dependence on oil-based revenues. In recent years, academician's focus has been shifted to crude oil which is studied differently with different assets and markets. Notably, Crude oil has been studied mainly with stock markets than other financial assets. Exploring its linkages with SCR is mainly important due to increased debt coupled with incredibly low oil prices amidst corona pandemic. Further, knowing these linkages can be helpful in framing the energy policies and sovereign funds for the countries, especially for oil exporting countries. Where on one side spillovers from crude oil to sovereign risk are relevant, measuring the intensity of reverse spill overs can further contribute in managing the risks to which international energy markets are exposed. Furthermore, measuring systematic impacts for crude oil price fluctuations needs to be addressed. Amidst the ongoing slump in the energy markets where there has been an incredible fall in oil prices and creation of a new structural break in oil prices, exploring such linkages is important to foresee the harm to these economies due to crude oil price fluctuations. Furthermore, Oil exporting countries plays a core role in international energy market where the shocks to oil exporting sovereigns gets spilled over to oil importing countries, either directly or indirectly through macro-economic channels. Measuring the systematic impacts of oil exporting and oil importing countries will be helpful in framing effective energy policies that will reduce the dependence of SCR on crude oil price fluctuations. Measuring such systemwide linkages is a non-linear phenomenon and requires a model that can capture high dimensional data for which Quantile Regression, Forecast Error Variance Decompositions, generalized variance decomposition etc can be used. Additionally, Measurement of reverse Spillover from SCR to crude oil price fluctuations can be useful in managing the volatilities of international energy markets. Besides energy markets, the findings reveal presence of limited study for the significance of linkages between Bitcoins and SCR. Bitcoins as an investment option can help in optimizing the portfolio as per risk adjusted measures (Henriques and Sardosky, 2018). Narayan et al. (2019)

has highlighted that bitcoin price growth impacts the growth of inflation, currency appreciation and money velocity reduction. Bitcoins can be directly or indirectly impact sovereign market returns via forex, inflation and money velocity. Hence, measuring the influence of bitcoin fluctuations on sovereign default risk can prove beneficial for banks and sovereigns in managing their foreign currency, particularly for countries with high inflation growth. As bitcoins can be of interest for high inflation countries, crude oil fluctuations are inevitable for oil dependent countries. The findings reveal limited or no study for the significance of SCR and ESG Investing, SCR and Green Bonds, SCR and Climate Finance, etc. These grey areas need to be explored in future research.

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