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The Impact of Cross-Border Banking on Financial Stability

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INTRODUCTION

The globalization of financial markets has ushered in an era of interconnectedness, where financial institutions increasingly operate across national borders. This phenomenon, known as cross-border banking, has both potential benefits and risks for financial stability. While it can enhance risk diversification and promote economic growth, it also poses challenges such as contagion effects and regulatory coordination issues.

This study aims to comprehensively investigate the impact of cross-border banking on financial stability, particularly within the European Union (EU). By examining the costs and benefits, developing metrics to measure optimal integration, and applying these metrics to EU countries, this research seeks to provide policymakers and regulators with valuable insights into the management of cross-border banking activities.

The study begins by analysing the costs and benefits of cross-border banking. While it can offer advantages like risk spreading and increased credit stability, it also introduces risks such as contagion and regulatory challenges. The research explores the interplay between these factors and their implications for financial stability.

To quantify the optimal level of cross-border banking integration, the study develops forward-looking indicators. These metrics aim to measure the extent to which a country's banking system is integrated into international markets while minimizing risks. By applying these indicators to EU countries, the research identifies which countries are more susceptible to systemic risks and which ones demonstrate optimal practices.

Furthermore, the study investigates the systemic risks associated with cross-border banking, particularly the risk of financial contagion. It examines how the interconnectedness of financial institutions can facilitate the spread of shocks across borders and explores the role of regulatory coordination in mitigating these risks.

The research also evaluates the trade-off between cross-border banking integration and local financial stability. While integration can provide diversification benefits, it can also increase vulnerability to external shocks. The study seeks to determine the optimal level of integration that allows countries to benefit from international markets without compromising domestic stability.

Finally, the study provides policy recommendations based on its findings. By identifying countries with imbalances or low diversification, the research offers guidance on how to improve financial stability through targeted interventions. The recommendations aim to enhance the resilience of cross-border banking systems and contribute to a more stable and efficient global financial landscape.

ABSTRACT

This study investigates the impact of cross-border banking on financial stability, focusing on the European Union (EU). By analysing the costs and benefits, developing metrics to measure optimal integration, and applying these metrics to EU countries, the research aims to provide policymakers with valuable insights.

The study finds that while cross-border banking offers benefits like risk diversification and credit stability, it also introduces risks such as contagion and regulatory challenges. The optimal level of integration depends on a country's ability to balance inward and outward integration and diversify its banking activities. A fully diversified and balanced banking system can improve financial stability.

The research develops forward-looking indicators to measure cross-border banking integration and applies them to EU countries. It identifies countries vulnerable to systemic risks and offers recommendations for improving financial stability through targeted interventions. The findings emphasize the need for careful management of cross-border banking to maximize benefits and minimize risks.

OBJECTIVE OF THE STUDY

The overall objective of this study is to investigate and quantify the impact of cross-border banking on financial stability. After 2007-2009 After the global financial crisis of 2000, transnational banking became a major research topic due to its potential stabilizing and destabilizing effects. This study aims to answer key questions related to the benefits, costs and optimal ways of cross-border banking integration, especially in the context of the European Union (EU). Given the increasing globalization of the financial system, it is essential for policymakers, regulators and financial institutions to understand the dynamics of cross-border banking in order to reduce risks and take advantage of the positive aspects of international banking.

1. Determine The Costs and Benefits of Cross-Border Banking.

The main objective is to analyze and balance the costs and benefits of cross-border banking. The study examines how cross-border banking affects financial stability, taking into account both positive aspects such as diversification and risk sharing and potential negative aspects such as contagion risk and coordination problems between regulatory authorities.

Cross-border banking can stabilize the financial system by allowing banks to diversify their portfolios across regions. This diversification can reduce contact with the local financial downturn and have a buffer on a unique impact of the country. The theoretical framework of this argument is anchored in the theory of investment portfolio (Markowitz (1957), which believes that the theory may reduce the diversified risk. However, the globalization of banking has also increased the interconnectedness of the financial system, raising concerns about systemic risks posed by cross-border institutions. This study aims to assess whether the benefits of diversification outweigh the risks of these linkages.

2. Develop Metrics to Measure Optimal Cross-Border Banking.

An important objective of this study is the development and application of forward-looking indicators for assessing the degree of cross-border banking integration. These indicators are designed to quantify the best cross-border banking practices that maximize the benefits of diversification while minimizing risks to financial stability. By constructing the index of internal and external integration, the aim of the study is to determine the extent to which the national banking system is integrated in international markets. In addition, an introverted and outgoing index is used to measure the changes in crossburnder investments in a country's banking industry.

The research assumes that when the introverted and external integration balance and diversification, the impact of cross -citizen banks on stability can maximize. Countries that exhibit a well-balanced and diversified integration pattern are expected to be less susceptible to contagion risks and more resilient to shocks in both domestic and foreign markets. The research also seeks to identify which countries within the EU demonstrate optimal cross-border banking practices and which ones are more vulnerable due to unbalanced or poorly diversified banking systems.

3. Metric Application to EU Countries.

The purpose of this study is to apply the developed indicators to EU countries to assess the current state of cross-border banking integration across the region. The European Union is a unique case of financial integration, especially due to the economic relations between the eurozone and the economic relations between the Member States. However, cross -banking integration throughout the region is very different and some countries have more banking systems than other countries. For example, countries such as the UK, Germany and the Netherlands have high levels of both internal and external diversification, suggesting that their banking systems are well positioned to manage both domestic and international risks. In contrast, countries such as Sweden, Finland and the new EU member states tend to be more vulnerable due to their unbalanced integration and heavy reliance on a few foreign banks.

By applying the metrics to specific EU countries, the research seeks to identify which countries are more susceptible to systemic risks and which ones could benefit from policy interventions to improve their banking system\'s resilience. The results of this analysis will help policymakers to target areas where cross-border banking practices could be optimized to enhance financial stability within the EU.

4. Management Of Systemic Risks and Contagion.

Another objective of this study is to examine the systemic risks associated with cross-border banking, particularly the risk of financial contagion. As banks expand their operations across borders, the likelihood of financial shocks spreading from one country to another increases. The study aims to determine the extent to which cross-border banking consolidation exposes countries to contagion risks and how these risks can be mitigated. This involves two direct infections, of which the financial institutions exposed to foreign markets will lead to influence and indirect infection.

The focus of this research is the role of regulatory coordination in management and cross -border banks -related system risks. In the absence of coordinated supervision, the failure of large cross-border banks could lead to serious disruptions in national and international financial markets. The study aims to highlight the challenges posed by a lack of regulatory coordination across countries and suggest ways to improve coordination between national regulators to prevent systemic failures.

5. Balanced Transverse Bank Integration and Local Stability.

The study also aims to evaluate the exchange between Cross -Citizen Bank integration and local financial stability. While cross-border banking provides diversification benefits, it can also increase a country's vulnerability to external shocks. The purpose of this study is to determine the optimal level of cross-border banking integration that will allow countries to benefit from international diversification without compromising domestic stability. The study shows that countries with high cross -cutting bank integration must be designed to balance domestic and foreign investments to avoid excessive exposure to foreign markets.

For countries that are integrated with a foreign banking system, the study shows that the balance method of cross -border banking is important to maintain domestic financial stability. For example, the Nordic and Baltic countries, which are highly integrated with each other and rely on a small number of large banks, could benefit from further diversification of their banking systems to reduce the risk of contagion. Similarly, a CNMI country that is heavily

dependent on Western European banks may need to diversify the approach of foreign banks to reduce their vulnerability to financial shocks in one region.

6. Policy Implications and Recommendations.

Finally, the study aims to provide actionable policy recommendations for enhancing the resilience of cross-border banking systems. By identifying countries vulnerable to cross-border banking imbalances or low diversification, the study provides guidance on how to improve financial stability through targeted policy interventions. The study recommends that countries with higher levels of cross-border banking integration focus on improving supervisory coordination to manage systemic risks and prevent contagion. The findings also have wider implications for the development of international financial regulation. The study recommends that supervisory authorities such as the European Central Bank (ECB) and the European Systemic Risk Board (ESRB) prioritize measures to increase the resilience of the EU banking system. This includes solving the overexposure of European banks for some regions (such as the United States) and encourages the diversification of domestic and foreign investments. In addition, the study emphasizes the need to coordinate crisis management and solutions, especially for important cross -bridal banks in the system.

This study aims to provide a comprehensive analysis of the impact of cross-border banking on financial stability. By developing and using forward-looking indicators, the study aims to identify best practices for cross-border banking.

Maximizing diversification benefits and minimizing systemic risks such as contagion. Applying these indicators to all EU countries provides valuable insight into the current state of cross-border banking integration in the region and highlights areas for improvement. Finally, the study aims to inform policymakers and regulators about the balance needed in cross-border banking to improve national and global financial stability.

LITERATURE REVIEW

The role of cross -border banks in the context of global financial stability has become an increasingly appropriate subject, especially after the 2008 global financial crisis. Cross -border banks are related to banks operating in several countries, thus introducing complex interaction between national and international banking systems. While this practice can lead to diversification benefits, it also presents significant challenges in terms of contagion risks and regulatory issues. This literature review discusses both the advantages and disadvantages of cross-border banking, examines its impact on financial stability, and provides insight into the balance required to optimize the benefits while minimizing the risks. Advantages of cross-border banking.

1. Risk Spreading

One of the most important advantages of cross-border banking is the possibility for banks to spread their risks across different geographical areas. As emphasized in portfolio theory (Markowitz, 1957), diversification allows banks to reduce the risk of domestic shocks by investing in foreign markets. This is a basic principle of risk management and has been repeatedly observed in empirical studies. Schoenmaker and Wagner (2011) argue that banks with diversified portfolios across countries are less exposed to financial instability in one country, which ultimately contributes to overall system stability.

For example, by holding assets in multiple countries, banks can mitigate the impact of local economic downturns, thereby reducing return volatility. Lewis (1999) also highlights that cross-border banking facilitates international risk sharing, enhancing the resilience of banks during times of domestic economic crises. Moreover, Boyd and De Nicoló

(2005) propose that competition brought about by cross-border banking can further strengthen stability through improved bank efficiency and reduced loan defaults.

2. Increase Stability in Local Loan.

Cross -Border Banking Business helps stabilize local loans. Foreign banks run by a country provide other sources of capital and credit, which can stabilize domestic credit supply during the economic emergency period. Goldberg et al. (2000) showed that foreign bank credit was more stable than domestic bank credit in Argentina and Mexico during the 1990s. Similarly, de Haas and van Lelyveld (2010) found that international banks, due to their access to international capital markets, were able to maintain or even increase lending during financial crises, while domestic banks were forced to reduce lending. This increases the resilience of the financial system and prevents credit tightening during domestic financial shocks.

3. Reduce The Risk of Borrowers.

Cross -border banking business has introduced increasing competition between banks, which can reduce loan interest rates and improve the profitability of borrowers. Schoenmaker and Wagner (2011) believe that reducing borrowing costs can reduce the risk of borrowers' breach of contract because the company can better repay its debt. In addition, Boyd and De Niccolo (2005) argue that increased competition can further reduce systemic risks in the banking system by mitigating moral hazard problems by incentivizing banks to carefully assess the creditworthiness of borrowers.

COSTS AND RISKS OF CROSS-BORDER BANKING

1. Risk Of Infection.

One of the most important risks associated with Cross -Citizen Banking is the potential for financial infection. The Cross -Business has increased the connection between banks in several countries, thereby increasing the possibility of financial influence from a country that can spread to others. Schoenmaker and Wagner (2011) emphasize that cross-border banks are more exposed to contagion effects than domestic banks due to their international exposure. For example, in 2007-2009 During the financial crisis of 2010, European banks that had large holdings of US mortgage bonds were hit hard by the subprime crisis. Allen and Gale (2000) and Brannermeier studies. (2009) Shows that Cross -Border Banks can distribute financial impact through interconnected markets, in particular by selling dilemma assets that can reduce asset prices worldwide. In addition, banks' dependence on foreign capital markets exposes them to foreign shocks, and the depletion of interbank capital flows during the financial crisis exacerbated liquidity problems across the banking sector.

2. Monitoring And Coordination Issues.

Another major issue of cross-border banking is the challenge of regulatory coordination. Cross-border banks are subject to different regulatory frameworks in each country in which they operate. This decentralized legislative environment can lead to a crack in increased adventure and economic instability. Schoenmaker (2011) emphasized that legislative failures, especially when cross -banks are being addressed during the crisis, can expand economic instability. The inability to coordinate cross-border supervision increases the difficulty of dealing with the insolvency of large, systemically important financial institutions.

3. "Cut and Run" Phenomenon.

Foreign banks, especially those with limited physical presence in a country, may be more likely to withdraw capital during times of economic instability, a phenomenon known as "cut and run". Peake et al. (2000) note that during financial crises, branches of foreign banks tend to be the first to leave, exacerbating credit shortages. Schoenmaker and Wagner (2011) argue that foreign banks are unlikely to remain committed to the market without significant fixed investment, thus creating greater volatility in the supply of credit during recessions. This highlights the importance of a balanced mix of domestic and foreign banks to ensure lending stability. Empirical evidence for cross-border banking.

Empirical studies have found mixed results regarding the net effect of cross-border banking on financial stability. Schoenmaker and Wagner (2011) develop a set of indicators to assess the desirability of cross-border banking based on the balance between levels of external and internal integration and diversification. Their findings suggest that countries with highly diversified banking systems, such as the UK and Germany, are more resilient to domestic and external shocks. In contrast, the new EU member states (NMS), which are heavily dependent on a small number of Western European banks, are more vulnerable to contagion effects.

De Haas and van Lelyveld (2010) also found that foreign banks play a stabilizing role in emerging markets, as they are less likely to reduce credit in times of crisis compared to domestic banks. However, other studies, such as Allen and Gale (2000), emphasize the risk of contagion, particularly when foreign banks are heavily invested in a single market, as seen in the European banks\' overexposure to the U.S. subprime mortgage crisis balance the benefits and risks.

Schoenmaker and Wagner (2011) argue that the optimal form of cross-border banking involves a balance between internal and external integration and a high degree of diversification. A diversified banking system can reduce contagion risks while benefiting from cross-border activity. Schoenmaker and Wagner have developed indicators that measure introverted and external integration and diversification, so decision makers can assess whether the national banking system is balanced or subject to foreign risks.

Example. Germany and the Netherlands have shown balanced integration, export -oriented and introverted banking activities. These countries are not easily influenced by economic instability as they can absorb local and foreign shock. In contrast, a couple of foreign bank credit dependence on countries (such as new Member States) face unbalanced banking systems against the main risks.

METHODOLOGY

The baseline empirical model is estimated at the bank level and specified as follows:

$$STAB_{ijt} = \alpha 0 + \alpha 1 FBP_{jt-1} + \sum_{k=2} \theta_k BANK_{kit-1} + \sum_{k=1} \gamma_k COUNTRY_{kjt} + v_i + \mu_{it} \quad (1.2)$$

where i, j and t represent bank, country and time, respectively. $STAB_{ijt}$ represents stability (Z-score), FBP_{jt} is a measure of foreign owned banks (i.e. either ratio of foreign banks to total number of banks in the host market, or the share of assets held by foreign banks in the host country or a foreign bank ownership dummy that takes the value of

one when a bank is foreign-owned and zero otherwise). As the impact of foreign bank penetration on domestic banking risk more likely emerges after a time lag, one-year lagged values of foreign penetration are used in the estimation. $BANK_{kit}$ are bank-specific characteristics; $COUNTRY_{jt}$ represents country-specific factors; v_i is the bank-specific fixed effect; and μ_{it}, is the error term. Equation 1.2 is estimated with 1-year lags of bank-specific variables to mitigate endogeneity.

We employ a bank-specific panel fixed-effects estimator with Driscoll–Kraay standard errors that are robust to heteroscedasticity, within-panel serial correlation as well as cross sectional dependence in the panel error residuals. In the current study, cross-sectional dependency could, for instance, emerge because of, among other factors, trade between nations, common financial integration, commodities and monetary shocks, and other unobserved crossborder spillover effects. The panel fixed-effects estimator is chosen not only because it is commonly adopted in extant literature but also because of some of its merits. First, as we are using bank-level panel data, fixed effects model allows unobservable bank-level individual effects, which may be heterogeneous across banks and constant over time. Second, fixed effects model allows the bank-level time-invariant effects to be correlated with explanatory variables, which is supported by the result of Hausman test.

It can however be argued that in estimating Eq. (1.2), identification issues could arise due to the dynamic nature of bank stability and the potential endogeneity of the foreign ownership variables. Banking systems might be characterised by information opacity, regulatory reforms, market power and relationship lending—all of which may cause persistence in the cost structure and profitability of banks—and hence, on stability. Endogeneity of the foreign ownership variables can arise from both reverse causality and omitted variable bias. For instance, foreign banks may be more inclined to enter markets where domestic banks are more fragile, since they incur lower costs for mergers and acquisitions. This reverse causality leads to biased results. To account for these dynamics and endogeneity problems, an alternative econometric methodology is employed to serve as a robustness check to the baseline results—the two-step system Generalised Method of Moments (GMM) in which Eq. (1.2) is estimated in its dynamic form by including the lag(s) of the dependent variable as an additional explanatory variable

RESEARCH GAP

Despite the extensive regulatory landscape surrounding cross-border banking, significant research gaps persist, particularly concerning the practical implications of these regulations. One notable gap is the lack of empirical studies investigating how regulations affect the efficiency of cross-border banking operations. For instance, while theoretical frameworks exist, quantitative analyses examining the relationship between regulatory compliance and operational efficiency are scarce. Furthermore, the impact of regulatory divergence—where different jurisdictions enforce varying regulations—on market competition remains underexplored. Such research is vital, as understanding how these discrepancies affect the competitive landscape can inform policymakers and banking executives alike. Additionally, the rise of emerging technologies, particularly fintech, presents another critical area for inquiry. The rapid evolution of digital banking solutions and blockchain technologies poses questions regarding the adequacy of existing regulations and their adaptability to new market realities. Addressing these research gaps is essential for developing a comprehensive understanding of the challenges and opportunities that cross-border banking faces in an increasingly interconnected world.

Understanding and addressing research gaps is crucial for advancing our knowledge of cross-border banking and formulating effective policies to ensure financial stability and promote economic growth in a dynamic global environment. Key gaps include:

1. **Lack of Empirical Studies on Regulatory Efficiency**: There is insufficient empirical research quantifying how cross-border banking regulations impact operational efficiency. Future studies should focus on collecting and analyzing data to elucidate the relationship between regulatory compliance and the efficiency of banking operations.
2. **Impact of Regulatory Divergence on Market Competition**: The effects of differing regulations across jurisdictions on market competition are not well understood. Research should investigate how variations in regulatory frameworks between countries influence competitive dynamics in the global banking market.
3. **Adaptation of Regulations to Emerging Technologies**: There is a gap in understanding how current regulations address or adapt to new technologies such as fintech and blockchain. Research should explore the effectiveness of existing regulations in accommodating these technologies and propose necessary updates or new approaches.
4. **Effects of Regional Regulatory Disparities**: The impact of regional differences in regulatory implementation on cross-border banking operations remains underexplored. Studies should examine how these regional disparities affect banking activities and operational efficiency.
5. **Long-Term Effects of Regulatory Changes**: There is a lack of long-term research on how changes in regulations influence cross-border banking over time. Future research should focus on the long-term implications of regulatory adjustments on banking operations and market stability.

DATA ANALYSIS

As far as data is concerned, the current paper relies on the Locational Banking Statistics (LBS) and Consolidated Banking Statistics provided by the Bank of International Settlement (BIS). Additionally, the data on International Banking Statistics as compiled by the Reserve Bank of India has also been used for the analysis to supplement the data provided by BIS. The methodology can be broadly divided into two parts. In first part, we discuss the main components of international assets and liabilities of Indian banks in the backdrop of the regulations under which they operate. This section will also include the other stylised facts related to counter-countries, currency denomination and also comparison of India with its peers in terms of their participation in cross- border banking operations. This will then be followed by the application of the network analysis to understand India's position *vis-à-vis* other countries with which the country shares cross-border banking relationships in terms of liabilities as well as assets.

The network analysis has emerged as an important tool to understand networks in recent times with applications in varied fields. The tool is also important in the economics and financial analysis to gain insights into networks operating in these sectors. As explained in the preceding section, there is a strand of the literature which has employed this tool to understand cross-border banking transactions. We will also apply this methodology to understand international banking in the Indian context. The network analysis is based on the graph theory, the branch of mathematics devoted to study pairwise associations between objects. The network in our analysis, in non-mathematical terms, consists of a set of vertices (also known as nodes, points) which represent the countries and edges (also known as line, arcs) showing the claims or liabilities between the country pairs. Since the focus of this paper is on India, the countries in our analysis are restricted to those with which India is involved in terms of cross-border banking transactions. Specifically, we have combined the information from BIS's Locational Banking Statistics and the Reserve Bank's International Banking Statistics to draw our sample. The Reserve Bank's database includes information on the

Top 14 and 13 countries with which India has the topmost liabilities and claims, respectively. For these countries, the data was then drawn from BIS's LBS database to find these countries' major banking counter-countries and the data wherever available, was included in our analysis to form the network and gain insights into the position of India. Apart from data on these major countries, we also included the countries and their major counter countries from the BIS database for which the counterparty-country was India. The flows under consideration in our analysis are international claim and liabilities. Since the Reserve Bank also compiles data on basis of LBS statements of BIS, we are assuming the data to be comparable with BIS's LBS. The data for network analysis pertains to Q1 of 2018. In our analysis, the total number of countries in the analysis of liabilities is 38 and in case of claims is 58.

To formalize our analysis, we are borrowing the Matrix Approach to the network analysis as adopted by Minoiu and Reyes (2013). Following them, we define the Matrix X with rows showing the lenders and the column representing borrowers. The cell xij, hence, represents, the weighted liabilities (or claim, as the case may be) of country i towards country j. The corresponding adjacent matrix is defined as At, where an element aij takes a value of 1 if xij is non-zero, and 0 otherwise. We used total flow from country i to country j as weights in our analysis and rescaled them for charting purpose using in-built algorithm in Gephi 0.9.2, an open-source software for network analysis. We will be finding out the following for our sample:

Node degree (in-degree and out-degree) and Weighted Node degree (weighted in-degree and weighted out-degree)

This measure gives the number of links for each node in a network. In the present analysis, we have a directed network (liabilities or claims of country i towards country j), therefore, the network has links which are outgoing as well as incoming. Hence, we also define out-degree and in-degree which are the number of outgoing and incoming links, respectively. However, since the information in BIS is not complete as not all the countries are reporting the detailed data, these measures may not reflect actual reality. Hence, we will give the weighted out- degree and weighted in-degree measure where the weights of edges are used. Further, the weight degree which is the sum of weight in-degree and weighted out-degree will also be calculated. These measures capture the centrality of the nodes as gauged by the level of their connectivity with the other nodes in a network.

Connectivity

It is one of the measures to capture the density of the network under observation. It is defined as the ratio of number of edges which exist in a network to the total number of edges which are possible between the nodes of the give network.

Betweenness Centrality

For a given node in a network, betweenness centrality may be defined as the relative frequency of its appearance in the shortest paths that exists between other pairs of nodes. This is also reflective of the importance of a country in the flows in a network.

The Indian banks have been engaged in international operations for the past many decades. However, as Kulkarni (1980) put it, the Indian banks were involved more in operations related to retail banking and foreign exchange business opportunities overseas rather than in international banking in the real sense and the same was reiterated in Verghese (1988). The reforms in Indian banking in the post-liberalization era gave some impetus to the international operations of the Indian banks. However, the Indian banks operating cross-borders are still subjected to a number of regulations and restrictions. The international banking transactions are regulated by the Reserve Bank of India under the Foreign Exchange Management Act, 1999 (FEMA). The Act empowers the central bank to frame regulations to prohibit, restrict and regulate the opening, holding and maintaining of foreign currency accounts and the limits up to which amounts can be held in such accounts by a person resident in India. Further, the maintenance of deposits/accounts between a resident in India and a person outside is also regulated by the Reserve Bank under the same Act. The Reserve Bank under the FEMA Act, 1999 also frames the regulation for foreign exchange business

conducted by the banks with their customers/constituents and issues directions for laying down the modalities with a view to implementing these regulations. Broadly speaking, the international banking transactions in India remain regulated under the overall partial capital account convertibility framework prevalent in India.

Some Stylized Facts

The statement on international liabilities/claims of banks classified according to type of instrument is presented in Table 1. As can be clearly seen, around one-third of the liabilities are in form of loans and deposits and even within this category, the money deposited under various accounts and schemes offered to the non-resident Indians (NRIs) is the major contributor. These NRIs deposits have been found to be positively related to relative interest rates, LIBOR and negatively related to political and geopolitical risks as well as external events like financial crises (Gordon and Gupta, 2004).

As far as claims are concerned, owing to regulations on international banking lending activities, the claims of Indian banks are, on the majority, loans to non-resident and foreign currency loans to residents. NOSTRO Balances and Placements Abroad form the major part of the claims. The other major category is outstanding export bills. The international liability to claim ratio for India is 2.1 showing the dominance of deposits in the international banking activities in the country. The overview of India's international liabilities and claims clearly show that cross-border banking in India is mostly restricted to catering the needs of the NRIs, exporters and foreign currency loans to the residents.

Table 1

International Liabilities/Claims of Banks Classified According to Type of Instruments

(Based on LBS Statements)

Amount in US$ Million

Liabilities Category	March - 2018	Claims Category	March - 2018
1. Loan & Deposits	**153747.1 (77.8)**	**1. Loans & Deposits**	**89572.6 (97.6)**
Foreign Currency Non-resident Bank [FCNR (B)] Scheme	**22036.3 (11.2)**	**Loans to Non-residents**	**30150.4 (32.9)**
Resident Foreign Currency (RFC) A/Cs	**265.5 (0.1)**	**Foreign Currency Loan to Residents**	**23583.6 (25.7)**
Exchange Earners Foreign Currency (EEFC) A/Cs	**4054.4 (2.1)**	**Outstanding Export Bills**	**13695.9 (14.9)**

Other Foreign Currency Deposits (Including Inter-bank foreign currency deposits)	1193.3 (0.6)	Foreign Currency in hand, Travelers Cheques, etc.	150.6 (0.2)
Foreign Currency Borrowing (Inter-bank borrowing in India and from abroad, external commercial borrowings of banks)	23073.3 (11.7)	NOSTRO Balances and Placements Abroad	21992.1 (24.0)
VOSTRO Balances and Balances in Exchange Houses and in Term Deposits	988.5 (0.5)		
Non-Resident External Rupee (NRE) Accounts	84643.5 (42.9)		
Non-Resident Ordinary (NRO) Rupee Accounts	12117.0 (6.1)		
Embassy Accounts	150.9 (0.1)		
Foreign Institutional Investors (FII) Accounts	5145.1 (2.6)		
ESCROW A/Cs	79.2 (0.0)		
2. Own Issues of International Securities	177.88 (0.1)	2. Holdings of Debt Securities	1416.50 (1.5)
Bonds	177.9 (0.1)	Investment in Foreign Government Securities	1416.5 (1.5)
Other Own Issues of International Debt Securities	-	Investment in Other Debt Securities Abroad	-

Liabilities Category	March - 2018	Claims Category	March - 2018
3. Other International Liabilities	**43591.4 (22.1)**	**3. Other International Assets**	**768.5 (0.8)**
ADRs/GDRs	**6942.2 (3.5)**	**Investments in Equities Abroad**	**172.9 (0.2)**
Equities of Banks Held by Non-residents	**21416.7 (10.8)**	**Capital supplied to and receivable profits from foreign branches of Indian banks and other unclassified intl. assets**	**595.6 (0.6)**
Capital/Remittable Profits of Foreign Banks in India and Other Unclassified International Liabilities	**15232.5 (7.7)**		
Total International Liability	**197516.36**	**Total International Asset +**	**91757.66**

+ : In view of the incomplete data coverage from all the branches, the data reported under the LBS are not strictly

comparable with those capturing data from all the branches.

'-' : nil or negligible.

Figures in parentheses are percentages to total.

Source: International Banking Statistics, Database on Indian Economy, RBI's Data Warehouse.

Currency Denomination of International Liabilities/Claims

Around 65% of international liabilities as well as international claims are denominated in Indian rupees (Chart 4a and 4b). As far as liabilities are concerned as we discussed earlier, various accounts and schemes offered to the NRIs form its major share and most of these are denominated in Indian rupee only. This higher proportion of Indian rupee in international liabilities and claims translates into lower currency risks for the Indian banks.

Chart 4

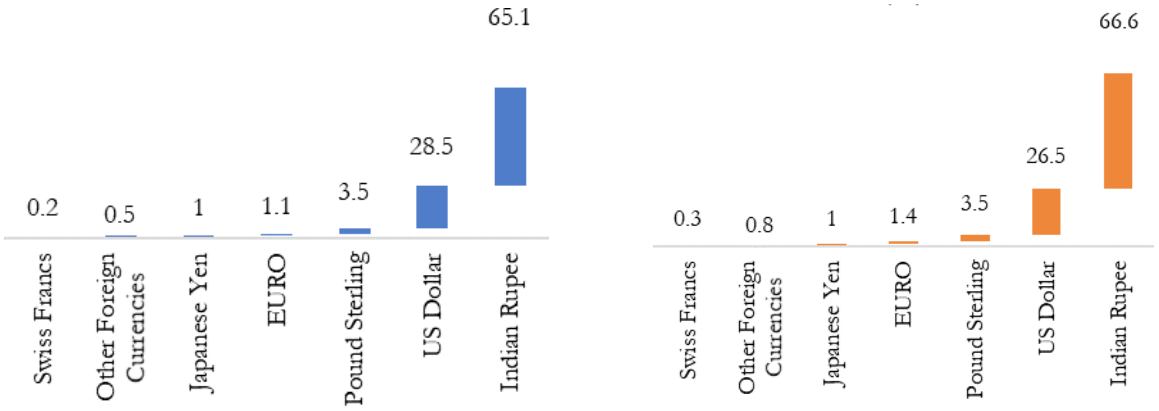
Share of Currencies of International Liabilities/Claims (Based on LBS Statements)

a: Share in International Liabilities

(%)

b: Share in International Claims

(%)



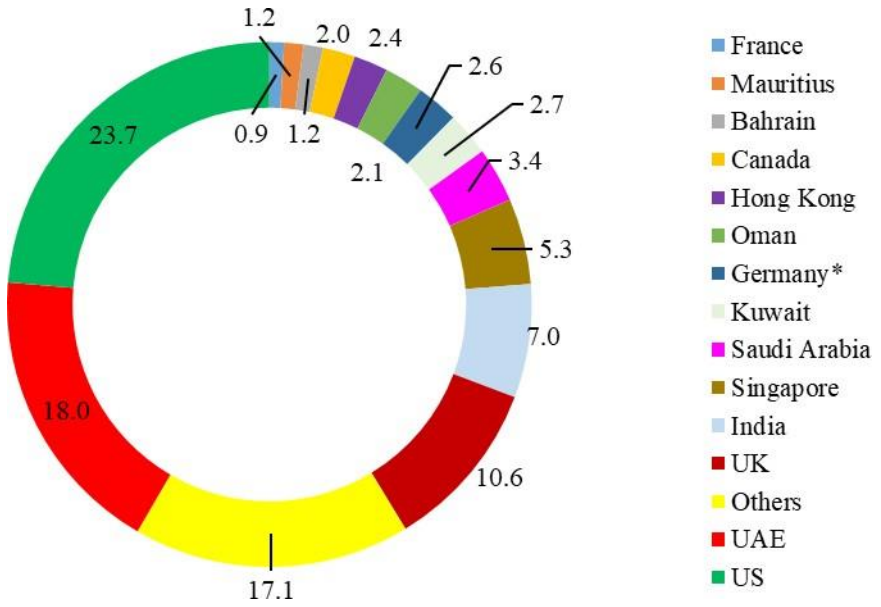
Source: Author's calculation based on International Banking Statistics, Database on Indian Economy, RBI's Data Warehouse.

Country of Residence in International Liabilities

The top three country of residence with the highest share in the international liabilities is the UAE, USA and United Kingdom. Many of these countries host significant part of Indian diaspora abroad and hence, are major source for NRI deposits in India (Chart 5).

Chart 5

Country of Residence in International Liabilities of India (Based on LBS Statements)



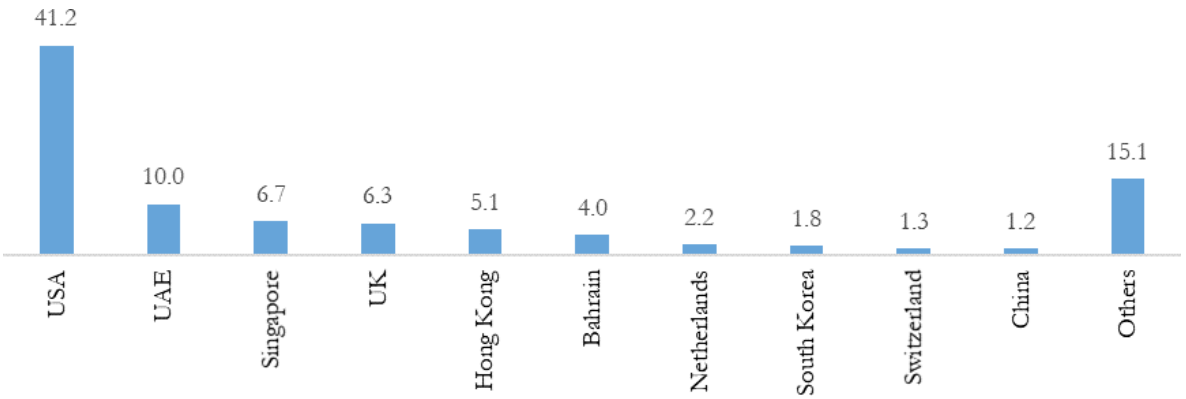
Source: Author's calculation based on International Banking Statistics, Database on Indian Economy, RBI's Data Warehouse.

5.1.1 Consolidated International Claims

The data shows that in the case of consolidated international claims of banks on immediate country risk basis, the highest proportion is that of the USA, followed by UAE, Singapore, UK and Hong Kong (Chart 6). While USA and UK are important international financial centers, Singapore and Hong Kong are important offshore financial centres. Hence, the risk materializing in these economies in general and banking sector in particular, may have potential spillover effects on India.

Chart 6

Share of Country of Transacting Units in Consolidated International Claims of Banks (Based on CBS Statements) in % - on Immediate Country Risk Basis



Source: Author's calculation based on International Banking Statistics, Database on Indian Economy, RBI's Data Warehouse.

Indian Cross-border Banking: An International Comparison

Despite the increasing share of India in global cross-border banking activity, its share remains very low (Chart 7). This may be attributed to the regulations on borrowing and lending across borders. In fact, among BRICS (Brazil, Russia, India, China and South Africa) the share of India is also not very significant (Chart 8). In fact, the share of India in cross-border claims has been more or less the same for the preceding period, during and after the great financial crisis of 2008. Hence, in context of global international banking scenario, the role of India is limited.

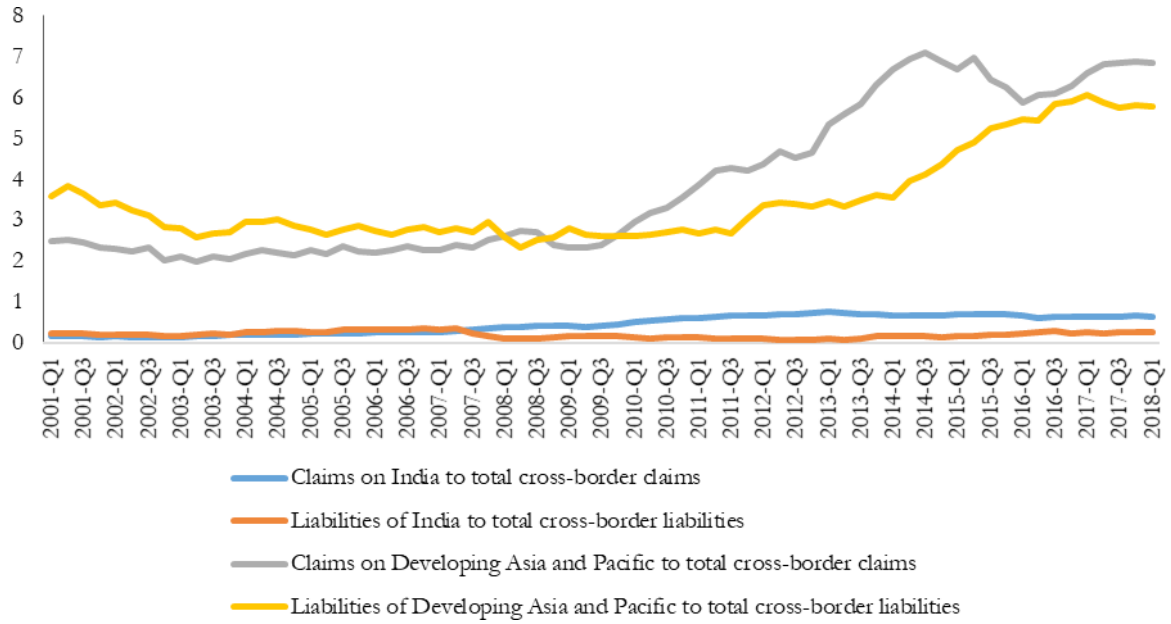
Indian Banking during Recent International Crises

Owing to the regulations on international banking activities in the country, Indian banking remained shielded during international crises of the recent past. The Indian banks continued to operate normally in the aftermath of the global financial crisis as outlined in Kumar and Vashisht (2009) and Sinha (2011). The main reasons cited for the normal functioning was the limited exposure of Indian banks to troubled assets, the prudential regulations by the regulator and limited presence of foreign banks in India (Sinha, 2011). However, indirect effects of the crises impacted Indian banks by putting pressure on domestic liquidity on the back of sudden reversals of foreign capital (Kumar and Vashisht, 2009). The Reserve Bank took a number of measures to ease liquidity conditions to ensure normalcy (see Sinha, 2011 for details

Chart 7

Shares Pertaining to India and Developing Asia and Pacific in

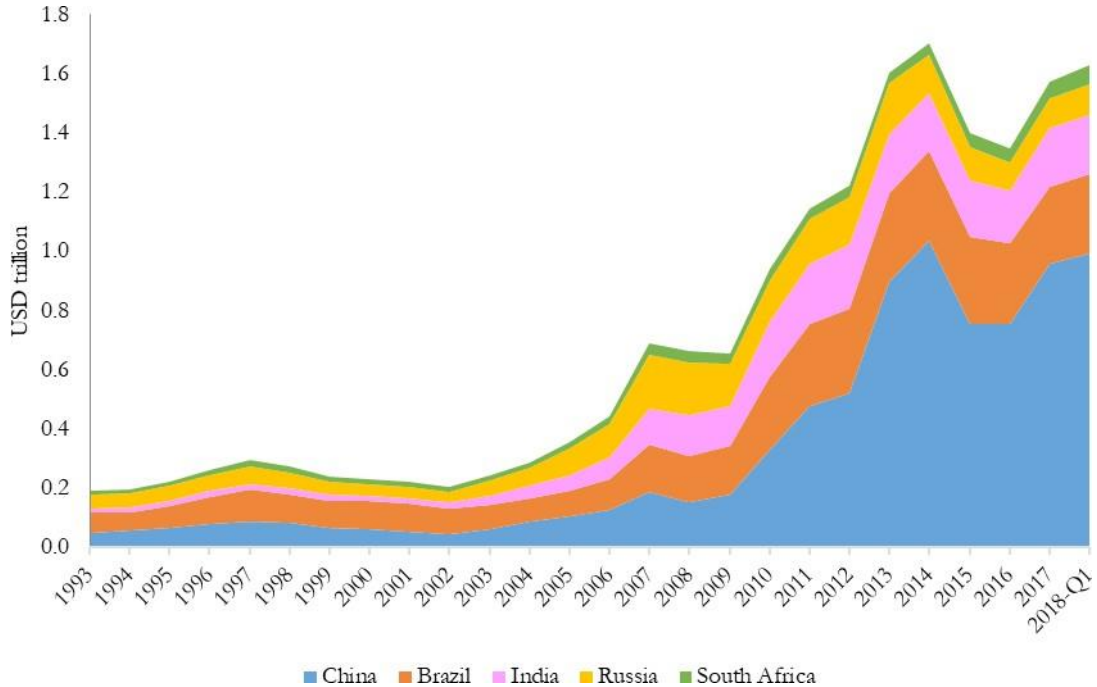
Total Cross-border Positions in % (Based on LBS Statements)



Source: Author's calculation based on Locational Banking Statistics, BIS.

Chart 8

Cross-border Claims on BRICs Countries



Source: Author's calculation based on Locational Banking Statistics, BIS

Network Analysis of Cross-border Banking in the Indian Context

Following the methodology described in Section 4, we now discuss the cross-border banking network keeping India in focus. As discussed in the preceding section, cross-border banking in India remains somewhat muted. We first discuss the network analysis in context of cross-border liabilities, followed by a discussion on cross-border claims. The network created, using the data as described in Section 4, the network for our sample is indicated in Chart 9. Among India's major counter-parties in case of cross-border liabilities, United States, United Kingdom, France, Germany and Japan are the most connected, as indicated by their weighted degrees. The ranking of the top ten countries along with the ranking of India is presented in Table 2. The network connectivity is

0.07 for this case. The network pertaining to cross-border claims is presented in Chart 10, followed by the ranking of major countries and India on different network measures in Table 2. The results as tabulated show that role of India is not that prominent, in spite of the fact that our data was focused on India. The network connectivity is computed to be 0.11. The highest rank of India in case of between centrality is because of the nature of our sample as we have included countries focusing on India. In case of cross-country claims as well, the role of India is depicted in terms of ranks. However, the results of this data come with the caveat that the analysis has been done on a limited number of countries. In the analysis of the entire set of countries, the results may differ from the current results. Overall, countries like United States, United Kingdom, France, Germany and Japan are among the most important players in the cross-border banking network pertaining to India.

Table 2

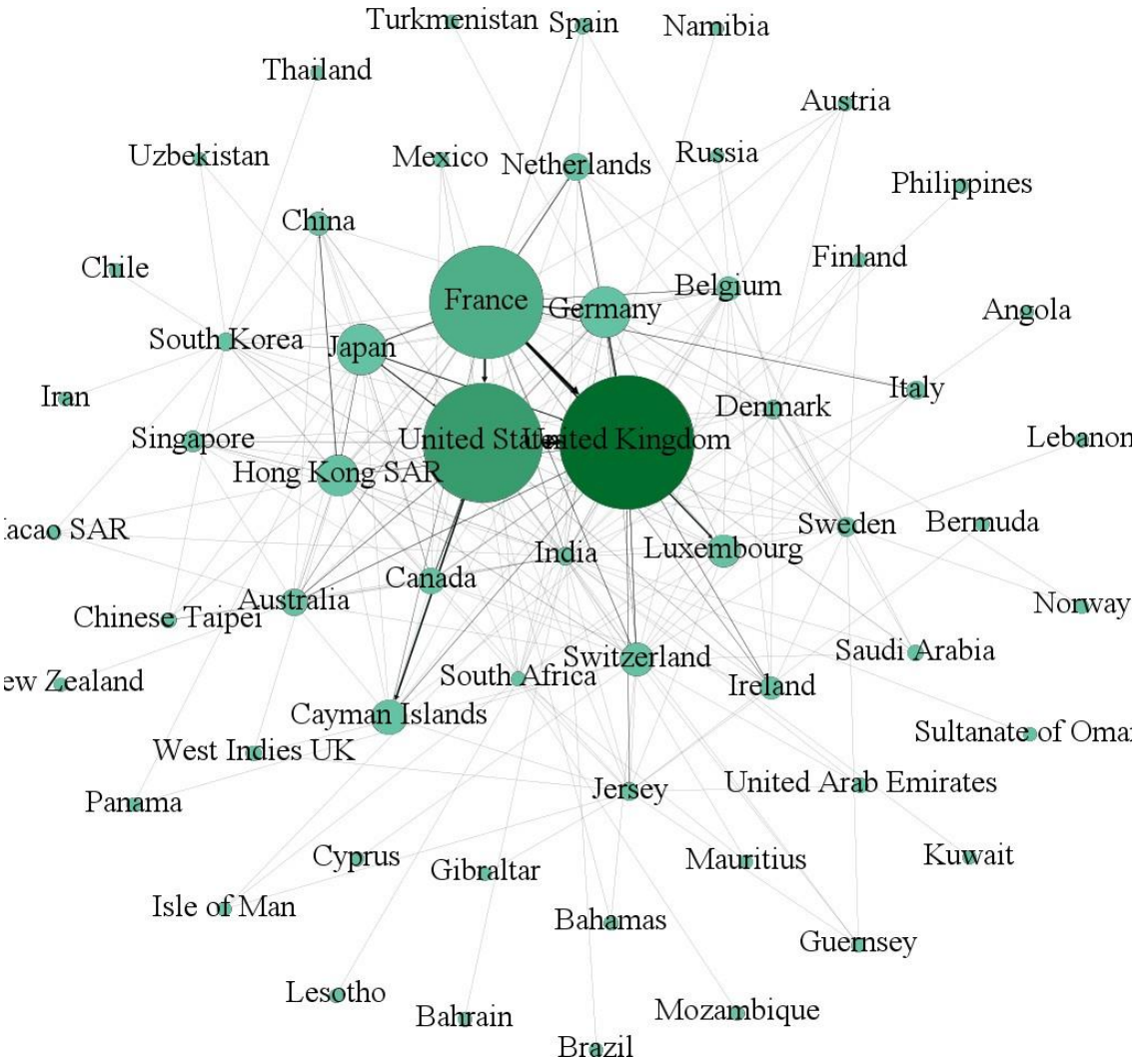
Network Measures for Cross-country Liabilities

Weighted In-Degree	Weighted Out-Degree	Weighted Degree	Betweenness Centrality
United Kingdom	France	United Kingdom	India
United States	United Kingdom	United States	United Kingdom
Cayman Islands	United States	France	Jersey
Germany	Japan	Germany	Germany
Luxembourg	Hong Kong SAR	Japan	Hong Kong
Japan	Germany	Hong Kong	France
Netherlands	Australia	Cayman Islands	South Africa
France	Switzerland	Switzerland	Switzerland
China	Canada	Luxembourg	United States
Ireland	Belgium	Netherlands	Denmark
India's Rank			
24	15	22	1

Source: Author's calculation based on data taken from Locational Banking Statistics, BIS and International Banking Statistics, Database on Indian Economy, RBI's Data Warehouse. The total number of countries in the analysis is 58.

Chart 9

Network Analysis of Cross-border Liabilities in the Indian Context

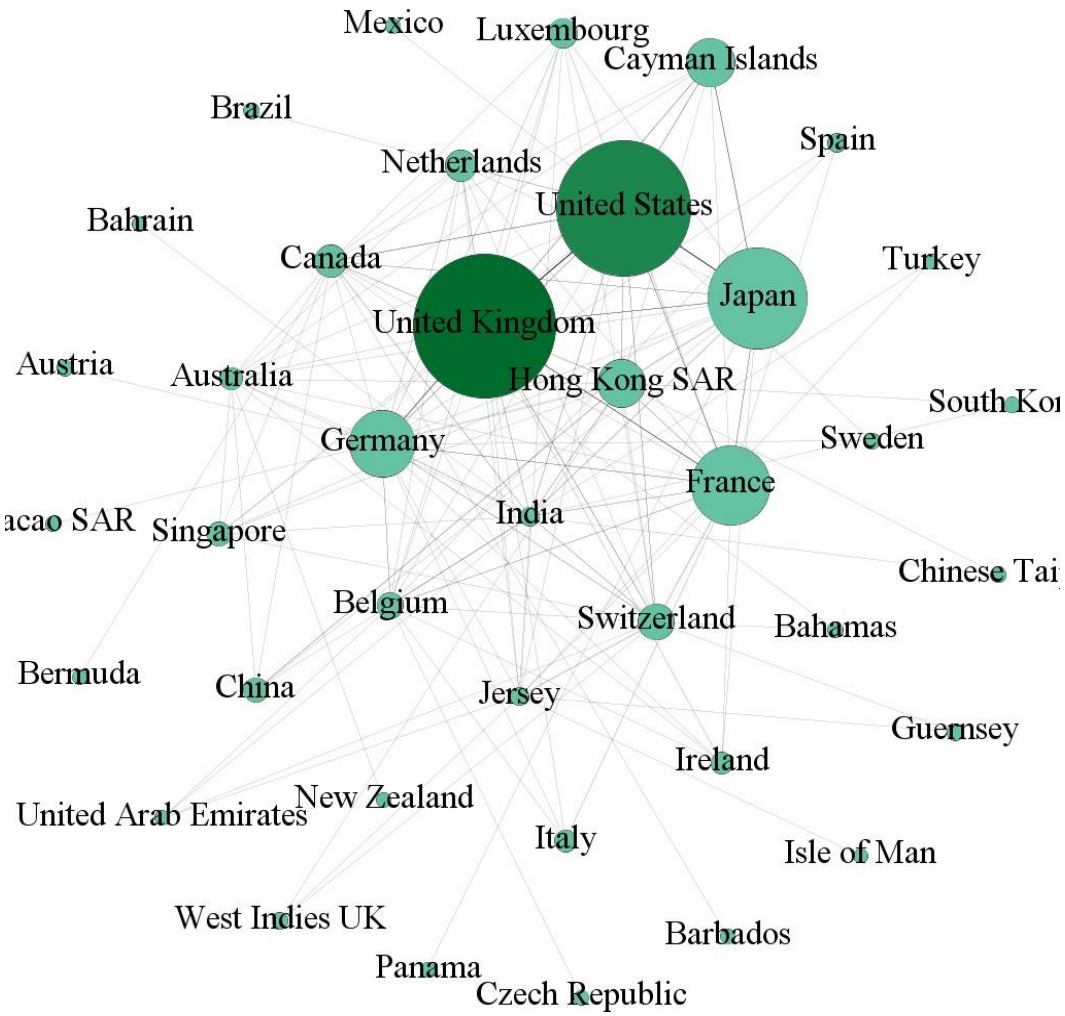


Source: Author's calculation based on data taken from Locational Banking Statistics, BIS and International Banking Statistics, Database on Indian Economy, RBI's Data Warehouse.

Note: The sizes of the nodes are representing weighted degree. The width of the edges represents the scaled weights. Nephi 0.9.2 has been used for the creation of the chart.

Chart 10

Network Analysis of Cross-border Claims in Indian Context



Source: Author's calculation based on data taken from Locational Banking Statistics, BIS and International Banking Statistics, Database on Indian Economy, RBI's Data Warehouse.

Note: The sizes and shades of the nodes are representing weighted degree. The width and shade of the edges represent the scaled weights. Gephi 0.9.2 has been used for the creation of the char.

Table 3

Network Measures for Cross-country Claims

Weighted In-degree	Weighted Out-degree	Weighted Degree	Betweenness Centrality
United States	United Kingdom	United Kingdom	India
United Kingdom	Japan	United States	Switzerland
Cayman Islands	United States	Japan	Germany
France	France	France	United States
Japan	Germany	Germany	Hong Kong SAR
Germany	Hong Kong SAR	Cayman Islands	France
Netherlands	Switzerland	Hong Kong	Canada
Luxembourg	Canada	Switzerland	United Kingdom
China	Australia	Canada	Belgium
Singapore	Belgium	Netherlands	Japan
India's Rank			
18	13	19	1

Source: Author's calculation based on data taken from Locational Banking Statistics, BIS and International Banking Statistics, Database on Indian Economy, RBI's Data Warehouse. The total number of countries in the analysis is 38.

CONCLUSION

In conclusion, cross-border banking is a vital aspect of the global financial system, characterized by its historical evolution and the complex regulatory frameworks that govern it. While significant strides have been made in establishing international regulations and promoting compliance, challenges remain, particularly in terms of regional disparities and the implications of emerging technologies. The identification of research gaps in this area underscores the need for further inquiry into the efficiency of cross-border banking regulations, the competitive dynamics they create, and their adaptability to new technological advancements. Addressing these gaps will not only contribute to a more robust understanding of cross-border banking but also inform the development of policies that enhance financial stability and promote economic growth in a rapidly changing global landscape.

Cross-border banking offers significant benefits, particularly in terms of risk diversification and credit stability, but it also introduces substantial risks, such as contagion and regulatory coordination challenges. The net effect of cross-border banking on financial stability depends on the extent to which a country or region can balance its inward and outward integration and diversify its banking activities. Although highly integrated banking systems are more

exposed to global financial shocks, they are also better equipped to deal with domestic economic downturns through diversification.

The findings of Schoenmaker and Wagner (2011) suggest that policymakers need to carefully manage the balance of cross-border banking to maximize its benefits while minimizing its risks. A fully diversified and balanced banking system can improve financial stability by spreading risks across countries and ensuring that no country or region is overly dependent on foreign banks. Future research should further explore the optimal level of cross-border banking integration and the role of supervision in managing the associated risks.

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