

Developing the Banking System Stability Index (BSSI) : Comparison and Ranking of Banking System of 127 Countries

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Abstract

The paper develops a Banking System Stability Index (BSSI) based on the six IMF Financial Soundness Indicators (FSIs) given in the global financial stability report (GFSR-WB). It further tries to rank 127 countries which are classified by IMF. The study attempts to fill the gap in the literature that exist between bank specific ranking done by Moody's and Financial System ranking done on the basis of FSIs. The six FSIs individually are found to be significantly different over the IMF classification of countries but not significantly different over the time period. The overall rankings without classification are found to offer a much lower rank to advanced economies contrary to the expectations. The BSSI index helps evaluate the banking system of the countries in comparison to the all other countries and within the specific regions helping governments, financial institutions, global investors and retail investor take more informed decisions with respect to their investment in the banking systems, financial governance, economic development, financial stability and countries global ranking in the financial world.

I. Introduction

THE GLOBAL FINANCIAL crisis highlighted the vulnerability of the banking system (Baldassarri, McCallum and Mundell, 1992; Agarwal and Agarwal, 2001, 2004a, 2004c, 2005, 2006, 2008, 2017, 2018; Baldassarri and Capretta, 2007; Agarwal, 2004; 2007; Fromlet, 2008; Agarwal, Solojentsev and Agarwal, 2008; Agarwal, Agarwal and Agarwal, 2016, 2017, 2018). Now un-certain times like Covid-19 tests the banking system resilience in the global financial system. The continuous deregulation and globalisation continue to pose the threat for banking crisis which lead to economic downturns and additional fiscal burden (Caprio and Klingebiel, 1999; Agarwal and Agarwal, 2001, 2004a, 2004c, 2005, 2006, 2008, 2017, 2018; Baldassarri and Capretta, 2007; Agarwal, 2004; 2007). The financial system

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which comprises of the banking network and central bank of different countries potentially creates the network for overall flow of credit. This flow of credit determines the growth of the economy and the world. The risk of a banking system failure poses a greater sovereign risk than a failure of a certain external debt payment by the government. Assessment of the risk of the banking system is an essential part of the external and internal stakeholder of an economy. Several reports by international agencies guide investors and other stakeholders including governments, civic bodies and international agencies into the risk of the global financial system. Interdependence and contagion effect has been observed during the global financial crisis and many currency crisis of the different countries (Agarwal and Agarwal, 2001, 2004a, 2004c, 2005, 2006, 2008, 2017, 2018; Baldassarri and Capretta, 2007; Agarwal, 2004; 2007). Potentially the strength of the economy increases if it has a strong banking system. There are different measures adopted by different countries to evaluate the financial stability of banks but comparison of the banking system is not usually available. The system is understood mostly in isolation and independent of each country. Many countries have also introduced the Financial Stability Report beginning with UK in the early 1990s and have been reviewing this to induce proper regulations within their Banking System, however lack the holistic approach towards the stability of the Banking and Financial System of a dynamically enriched economy. One needs to recognise that the interdependence of credit flows and integrated market systems through exchange of currencies, capital flows and trade makes every country vulnerable to a weak banking system (Baldassarri, McCallum and Mundell, 1992; Agarwal, 2004, 2007; Agarwal and Agarwal, 2001, 2008, 2017, 2018; Agarwal, Agarwal and Agarwal, 2016, 2017).

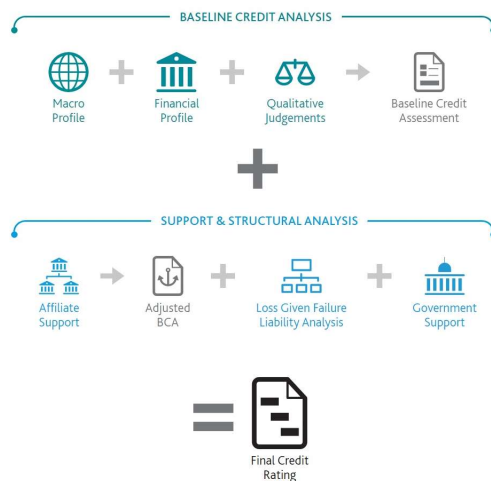
The Banking Sector is one of the key driving component of the financial system. The financial intermediation and the role of banks in economic development is evidenced by several researches (Agarwal and Agarwal, 2001; Levine, 2005; Fromlet, 2008). The strength banking system provides as a key driving force to the financial system plays a vital role in the economic and financial development of an economy (Agarwal and Agarwal, 2005, 2017, 2018). The work on benchmarking financial system by Cihak, Kunt, Feyen and Levine (2012) emphasize that researchers do not have cross country and cross time series data to measure the quality of the financial system in terms of its size, efficiency or stability. They reflect on this quality of the financial system but do not benchmark the banking systems in different economies to understand the key strength of the financial system.

This paper is an attempt to rank the banking systems in the different economies based on the prior classification of the economies in groups as per IMF. The paper is based on certain banking parameters and tries to understand the strength of the banking system. It proposes the establishment of a new index - Banking System Stability Index (BSSI) - using key financial system soundness indicators which then leads to the determination of the ranks of the banking systems in the economies worldwide being classified aprior based on their economic, social and regional developments. The Global Financial Stability database on financial soundness indicators are used to develop the Banking System Stability Index (BSSI). The paper attempts to

study the financial soundness indicators from a period of 2010 to 2018 (as per data available from IMF in GFSR-FSI, 2020) to understand if the health of the banks has improved or become worse in the 9 year period under study. More than a decade later than the global financial crisis had it the World Economy (Baldassarri and Capretta, 2007; Agarwal, 2007), it is important to learn how our banks are placed with-in the bounded constrains of operation of international and domestic economic, political and social developments. Crisis prevention and management is a continuous process where countries have different expertise to upgrade their banks regulation and supervision given the legal environment and governance problems. Kunt, Detragiache and Tressel (2006) refer to the use of the Basel Core Principles for effective banking supervision which make the banking system sounder, where the role of regulation and supervision is critical. Countries which require their banks to regularly report their financial data to regulators and market participants have more sound banks. Cihak, Kunt, Feyen and Levine (2012) developed the measures of benchmarking financial systems on the basis of four characteristics which were (a) Financial Depth; (b) Access (c) Efficiency and (d) Stability. To understand the soundness of the banking system it is important to understand which all parameters from amongst the suggested in the literature can be used to develop the BSSI.

1.1 Moody's Bank Credit Rating Methodology

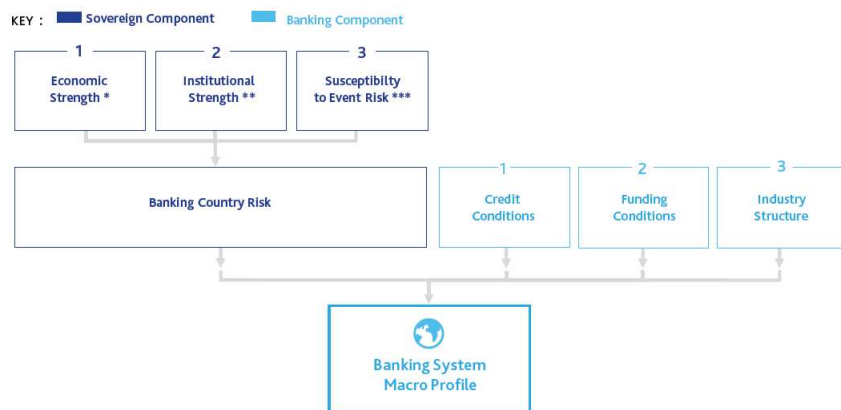
Moody's Bank Credit Rating is a measure to develop a similar rating for US banks based on several parameters. The rating by Moody was based on Baseline Credit Analysis and Support & Structural Analysis which add to given the final rating for individual banks. The rating in the baseline credit analysis uses macro profile, financial profile and qualitative judgements. In the Support & Structural Analysis Moody uses the affiliate support, loss given failure liability analysis and government support (see Figure 1)



Source: Moody's Investor Service Bank Rating Profile (USA)

Figure 1
Moody's Rating Process using
Base Line Credit Analysis + Support & Structural Analysis

Moody's individual bank macro profile helps assess the banking system macro-economic profile which is a factor of sovereign component or country specific components in which they include economic strength, institutional strength, susceptibility to event risk and banking country risk. It also includes three banking conditions namely credit conditions, funding conditions and industry structure (see Figure 2).



Note: * Excluding adjustment to credit Boom
 ** Excluding adjustment to track record for sovereign default
 *** Excluding banking factors

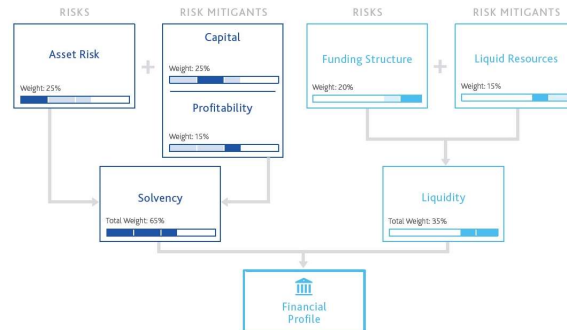
Source: Moody's Investor Service Bank Rating Profile (USA)

Figure 2
Moody's Individual Bank Macro Profile

Demirgüç-Kunt and Detragiache (1998) in their multivariate logit model explored the macro-economic indicators which are associated with the emergence of banking crises. Results of their study indicate that the economic state with low growth, high inflation and high interest rates are usually associated with banking crisis. The study also indicated that countries with explicit deposit insurance schemes were more at risk. Also in studies of Agarwal and Agarwal (2005); Cihak and Scheck (2007); Babihuga (2007) it has been found that business cycle and inflation rate affect the financial soundness indicators and the over all financial development of an economy.

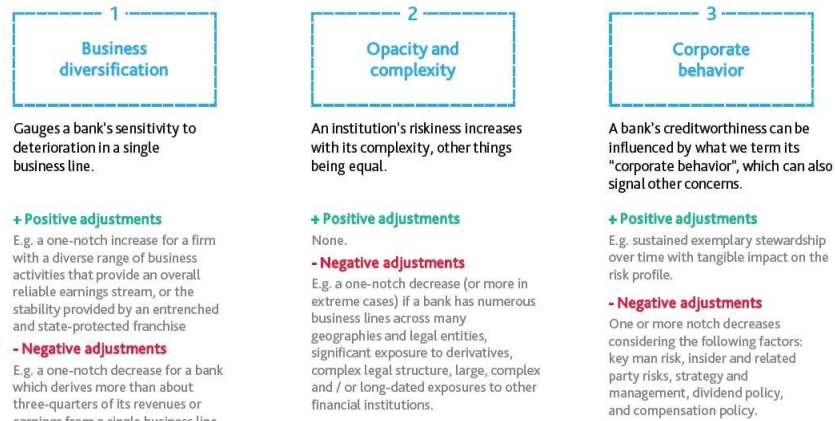
The financial profile outlined in Moody's Bank rating methodology gives weightages to the different financial parameters by dividing it into solvency parameters and liquidity parameters. Here the risk are from the asset risk and risk mitigants like the bank's capital and bank's profitability measuring the solvency of the banks. The liquidity parameters use the funding structure as a risk factor and liquid resources as the risk mitigants. In our paper we concentrate on the financial profile of the banks of the different countries classified by IMF for development of the Banking System Stability Index (BSSI) assuming that the classification would take care of the macro profile and qualitative judgements of the banking system (see Figure 3)

In support Moody's further adjust Baseline Credit Analysis of the bank based on the exposure of the bank to a single business line (business diversification); opacity and complexity; and corporate behaviour (see Figure 4)



Source: Moody's Bank Rating Methodology (USA)

Figure 3
Financial Profile Assessment of Banks



Source: Moody's Bank Rating Methodology (USA)

Figure 4
Qualitative Judgements

In the Support and Structural Analysis consist of affiliate support which includes parent and co-operative group support measured through unsupported ratings; creditworthiness; support probability and dependence (correlation). In the liability side analysis it takes into account legislative and non-legislative measures to meet the liability from depositors and creditors through statutory provisions and other support measures especially in case of bankruptcy and failure. The last measure of the support and structural analysis includes government support which measure the sovereign rating, probability of support, dependence and potential uplift.

Sundarajan, Enoch, Jose, Hilbers, Krueger, Moretti and Slack (2012) and IMF (2019) defined financial soundness indicators as indicators compiled to monitor the health and soundness of financial institutions and markets and of their corporate and household counterpart. Financial Soundness Indicators have two components which include the core indicators and encouraged indicators. The core set has 15 indicators to measure potential vulnerabilities of Deposit-Takers which include parameters on (a) Capital Adequacy; (b) Asset Quality; (c) Earnings and Profitability; (d) Liquidity and (e)

Sensitivity to Market Risk. The encouraged set may be collected in accordance with a country's need (a) including 13 additional indicators for Deposit-Takers; (b) 2 for market liquidity; (c) 2 for Nonfinancial corporations; (d) 5 for Corporate Sector; (e) 2 for households, and 3 for real estate markets. We reproduce the sets of deposit taking institution which are banks and deposit takes and other financial corporations (see Table I).

Table I
Financial Soundness Indicators for Banks and other financial corporation

Deposit Taking Institutions	
Core Set	
(a) Capital Adequacy	- Regulatory Capital to Risk Weighted Asset - Regulatory Tier I Capital to Risk Weighted Asset
(b) Asset Quality	- Non Performing Loans to Total Loans - Non performing loans net provision to Capital - Sectoral Distribution of loans to Total Loans - Large exposure to Capital
(c) Earnings and Profitability	- Return on Assets - Return on Equity - Interest Margin to Gross Income - Non Interest Expenses to Gross Income
(d) Liquidity	- Liquid Assets to Total Assets - Liquid Assets to Short Term Liabilities
(e) Sensitivity to Market Risk	- Duration of Assets - Duration of Liabilities - Net Open position for foreign exchange to capital
Encouraged Set	
Core Set	
(a) Deposit Takers	- Capital to Asset - Large Exposure to Capital - Geographical distribution of Loans to Total Loans - Gross Asset Position in financial derivatives to Capital - Gross Liability Position in Financial Derivatives to Capital - Trading Income to Total Income - Personnel Expenses to Non Interest Expenses - Spread between reference Lending and deposit Rates - Spread between highest and lowest Interbank rates - Customer Deposits to total (non interbank) Loans - Foreign Currency dominated Loans to total loans - Foreign Currency dominated liabilities to total liabilities
(b) Market liquidity	- Net Open Position in equities to Capital - Average bid-ask spread in the securities market* - Average daily turnover ratio in the securities market*
(c) Nonbank financial institutions	- Assets to total financial system assets - Assets to GDP
(d) Corporate sector	- Total debt to equity - Return on equity - Earnings to interest and principal expenses - Corporate net foreign exchange exposure to equity - Number of applications for protection from creditors
(e) Households	- Household debt to GDP - Household debt service and principal payments to income
(f) Real Estate Markets	- Real estate prices - Residential real estate loans to total loans - Commercial real estate loans to total loans

Note : * Or in other markets that are most relevant to bank liquidity, such as foreign exchange markets.

Source: Sundarajan, Enoch, Jose, Hilbers, Krueger, Moretti and Slack (2012)

As per the ADB report on FSI report on Financial Sector (2015) core set is based on the CAMEL framework which includes capital based indicators that check the sufficiency of capital to support any asset side loss measured by risk weighted assets or nonperforming loans. To understand the potential vulnerabilities of Deposit-Takers Sundarajan, Enoch, Jose, Hilbers, Krueger, Moretti and Slack (2012) outline that Asset Quality shows the deposit takers asset composition. It also shows the vulnerabilities to the potential losses from non-performing loans and risk from lack of diversification; while earning and profitability ratio show the efficiency of the banks to utilise their assets; liquidity ratio shows the ability to the deposit taking institution to meet the sudden demand for cash and sensitivity to market risk measure the ability of the capital to cushion the exchange rate volatility.

Cihak and Schaeck (2007) , Laeven and Valencia (2012) and Navajas and Thegeya (2013) results for the period of 1990s crisis, global financial crisis and for period of 2005 to 2012 crisis respectively indicate that there is significant correlation between financial soundness indicators and banking crisis. They found that regulatory capital to risk weighted assets (CAR) and return on equity (ROE) show significant negative correlation with occurrence to banking crisis. They also found that lagged ROE is a leading indicator of crisis. These studies used the FSI which were collected by the international agencies which allow cross country comparisons through consistent accounting, aggregation, and consolidation principles.

Agarwal and Agarwal (2005); Cihak and Scheck (2007) found that FSI fluctuate more with macroeconomic indicators like business cycles and inflation. Demirgüç-Kunt and Detragiache (1998) were the first to use the FSI as explanatory variables to develop models for banking crisis. On the individual bank level Sun (2011) was found the leverage ratio to be most reliable for predicting crisis. Bunn and Redwood (2003) with reference to firm specific factors and financial stability in UK, found negative relationship between profitability and corporate failure. They also found positive relationship between the debt to assets ratio and the probability of failure.

1.2 IMF-FSI Compilation using BIS Basel Capital Accord

Basel Committee on Banking supervision (BCBS) sets the international standard on the basis of which IMF compiles the FSI. Prior to 1988 there was no previous accord for international standard to measure the financial soundness of banks. The Basel Capital Accord was able to introduce internationally accepted definitions to regulatory capital. It also linked capital requirement to risk by giving risk weightages to the assets of the bank. It also established a minimum capital requirement of 8% of risk weighted assets for international banks which became a standard for banks worldwide. Basel I required that the capital requirement be met by Tier I capital and Tier II capital where it only considered credit risk. Basel II requirement continued to maintain the requirement of 8% capital with different weightages given to AAA rated corporate loans to CCC rated corporate bonds. Basel III introduced in 2010 was more comprehensively responsive to the lessons learnt from banking crisis. While retaining the original requirement of 8% as in Basel I and II there was a need for additional capital to risk weighted assets of 2.5% which made the effective capital requirement to 10.25%. Basel III made the requirement of minimum common equity capital Tier I capital of 4.5% which is effectively 7% with 2.5% as the conservative capital to be met through the

common equity Tier I capital. Basel III introduced first time agreed international standards for liquidity not only demanding keeping high quality liquid assets but also focus on liquidity management.

Basel I	Basel II	Basel III
Capital adequacy framework <i>Definition of capital</i> <ul style="list-style-type: none"> • Tier 1 capital (equity and disclosed reserves) • Tier 2 capital (undisclosed and revaluation reserves, general provisions up to 1.25 percent of risk-weighted assets, subordinated debt) • Tier 3 capital (medium-term debt with lock-in provisions) • Supervisory deductions (goodwill and other intangibles) applied to Tier 1 capital • Investment in unconsolidated subsidiaries deducted from total capital 	Capital adequacy framework <i>Definition of capital</i> <ul style="list-style-type: none"> • No changes from Basel I except (i) significant investments in capital instruments of insurance companies and minority investments in the capital instruments of banking, securities and other financial entities are to be deducted 50 percent from Tier 1 and 50 percent from Tier 2 capital; and (ii) banks using the advanced approaches must deduct any shortfall in provisions relative to expected loss from capital (50 percent Tier 1, 50 percent Tier 2), and may include any surplus in Tier 2, to a maximum of 0.6 percent of RWA. 	Capital adequacy framework <i>Definition of capital</i> <ul style="list-style-type: none"> • Common Equity Tier 1 (equity and disclosed reserves) • Additional Tier 1 (subordinated instruments with no maturity) • Tier 2 (long-term subordinated debt) • Wider set of supervisory deductions that apply to CET1 and AT1 • Capital conservation buffer • Countercyclical capital buffer • Systemic risk charge for G-SIFIs • Tier 3 capital is eliminated
Credit risk <ul style="list-style-type: none"> • Simple fixed risk-weights • Four risk categories • From 0 to 100 percent 	Credit risk <ul style="list-style-type: none"> • More sensitive measures of risk • Standardized approach • Internal ratings-based approach • Foundation IRB approach • Advanced IRB approach 	Credit risk <ul style="list-style-type: none"> • More granular Standardized Approach, and introduction of an alternative to external ratings. • Restrict the use of Advanced IRB approach for exposures to banks, financial institutions and certain large corporates. • Equity exposures are subject to the standardized approach only.
Market risk <ul style="list-style-type: none"> • Explicit cushion for price risks, in particular from trading activities 	Market risk <ul style="list-style-type: none"> • No changes from Basel I 	Market risk <ul style="list-style-type: none"> • More Integrated management of market risk • New standardized and simplified standardized approaches • Clearer delineation of the boundary between the trading book and banking book.
	Operational risk <ul style="list-style-type: none"> • Basic indicator approach • Standardized approach • Advanced measurement approach 	Operational risk <ul style="list-style-type: none"> • New Standardized approach replaces all other options
		Leverage ratio <ul style="list-style-type: none"> • Simple, transparent, and non-risk-based leverage ratio
		New liquidity framework <ul style="list-style-type: none"> • Short-term ratio (LCR) • Longer-term ratio (NSFR)
	Supervisory review process <ul style="list-style-type: none"> • Cover other risks (concentration, reputational, etc.) • Supervision should go beyond capital requirements compliance 	Supervisory review process <ul style="list-style-type: none"> • Enhanced oversight of credit and market risks
	Disclosure requirements <ul style="list-style-type: none"> • To encourage market discipline 	Disclosure requirements <ul style="list-style-type: none"> • Additional disclosures for credit, market, and liquidity risk supplement Basel II disclosures

Source: IMF-FSI Compilation Guide 2019

Figure 5
Capital Adequacy Framework (Basel I, Basel II and Basel III)

In the light of the development in the banking sector, it becomes important for different stakeholders to evaluate the banking system of different countries based on the financial soundness indicators besides macro-economic factors to understand if there is risk to their banking system and if there exist a contagion effect. Individual indicators cannot give complete picture of the banking system but a methodology needs to be devised where the index can help evaluate all the parameters together. This study aims at developing the parameters using the same methodology used by UNDP to develop indexes like HDI, HPI, GDI and others. The similar technique is used to develop the new index to evaluate the banking financial system stability with the introduction of the new index - Banking System Stability Index (BSSI).

II. Objectives

The primary objective of the paper is to develop a rank of Banking System of countries based on Banking System Stability Index (BSSI).

To achieve the main objective of ranking the banking systems and to establish the BSSI the following sub-objectives have been identified

- i. to analyse the financial soundness indicators over a period of 9 years (2010-2018) for the changes in different groups of economies.
- ii. to develop a banking system stability index
- iii. to rank the countries on the basis of their Banking system stability index in their given group from 2010 to 2018

III. Data and Research Methodology

Martin, Demirgüç-Kunt, Feyen and Levine (2012) introduce the Global Financial Development Database in their paper as an extensive dataset of financial system characteristics for 205 economies from 1960 to 2010. The database includes measures of (a) size of financial institutions and markets (financial depth), (b) degree to which individuals can and do use financial service financial institutions and markets (stability). The database of Global financial development Report provides for 112 indicators of the financial system which can be evaluated for the different groups of countries identified as High, Upper Middle Income, Lower Income group countries. The Appendix A of the Global Development Report on the Banking Regulation and Supervision (GFDR-WB, 2019) provides for the assessment of the Banks through the use of the z-score based on several parameters but do not allow to evaluate the banking system based on basis of only two parameters at a time which the Regulatory Capital to Total Asset added to the Return on Assets which is then divided by the standard deviation of Return on Asset. In the survey done in the Global Development Report on the most important regulation that needs to be taken into consideration for banking system was regulatory capital. The study presently does not focus on the system per se but does look into the stability factors of the Banking Financial System in different countries. To develop the Banking System Stability Index (BSSI) that includes the FSI Core set we follow a multi-dimensional approach to include the indicators given by IMF in the Global Financial Stability Statistics for 127 countries for a period of 2010 to 2018 i.e 9 years (as per data available from IMF in GFSR-FSI, 2020). The countries have been divided into groups as (a) Advanced Economies; (b) Emerging Economies and (c) Developing Economies. The Emerging economies and developing economies are divided into (a) Central and Eastern Europe; (b) Commonwealth independent states; (c) Developing Asia, Middle East and North Africa Countries; (d) Sub Saharan Africa; (e) Western Hemisphere. The main criteria used by the IMF in country classification are (a) per capita income level ; (b) export diversification ; and (c) degree of integration into the global financial system. The classification helps us to evaluate economies with similar economic and financial conditions which is macro profile in Moody's Credit Rating and also encourage set in the FSI indicators. Similar classifications are used by the study to make uniform understanding of macro-economic profiles.

Amongst the 127 Countries Banking Systems studied the Advanced economies has a set of 33 Countries; in the Central and Eastern Europe there are 10 economies; in the Commonwealth Independent States there are 9 economies;

in Developing Asia there are 19 economies; in Middle East and North Africa there are 7 economies; in Sub Saharan Africa there are 23 economies; and in Western Hemisphere there are 26 economies. Advanced Economies includes Australia, Austria, Belgium, Canada, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong SAR, Ireland, Israel, Italy, Japan, Korea, Latvia, Luxembourg, Malta, Netherlands, Norway, Portugal, San Marino, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, United Kingdom and United States. Central and Eastern Europe includes Bosnia and Herzegovina, Bulgaria, Croatia, Hungary, Kosovo, Lithuania, Macedonia, FYR, Poland, Romania and Turkey. Commonwealth of Independent States includes Armenia, Belarus, Georgia, and Kazakhstan. Moldova, Russia, Tajikistan, Ukraine, Uzbekistan. Developing Asia includes Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, Fiji, India, Indonesia, Macao, Malaysia, Maldives, Myanmar, Philippines, Samoa, Solomon Islands, Sri Lanka, Thailand, Tonga, Vanuatu and Vietnam. Middle East and North Africa includes Afghanistan, Algeria, Lebanon, Pakistan, Saudi Arabia, United Arab Emirates and West Bank and Gaza. Sub-Saharan Africa includes Botswana, Burundi, Cameroon, Central African Republic, Chad, Congo, Equatorial Guinea, Gabon, Ghana, Guinea, Kenya, Lesotho, Madagascar, Mauritius, Namibia, Nigeria, Rwanda, Seychelles, South Africa, Swaziland, Tanzania, Uganda and Zambia. Western Hemisphere includes Argentina, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Trinidad and Tobago and Uruguay.

The following Financial Soundness Indicators (see Table II) are used for developing the Banking System Stability Index (BSSI):

- i. Bank Total Regulatory Capital to Risk Weighted Assets (RWA)
- ii. Bank Capital to Total Asset
- iii. Bank Good Loans to Total Asset (100-Banks Non performing loans to Total Gross Loans Ratio)
- iv. Bank Provision to Non-Performing Asset (NPAs)
- v. Return on Assets (ROA)
- vi. Return on Equity (ROE)

Table II
Sourcing and Compilation on Financial Soundness Indicators

FSI Definition	Source Data	Compilation
i. Ratio of total regulatory capital to risk weighted assets (RWA).	– Supervisory data on aggregated total regulatory capital and RWA	– Regulatory capital refers to a specific definition of capital developed by the Basel Committee on Banking Supervision (BCBS), as adopted by national authorities, with or without adjustments and exercise of national discretion. – RWA measured differently depending on the version of the Basel Accord adopted by national authorities, with or without adjustments.
ii. Bank Capital to Total Assets Ratio of Tier 1 capital to total assets. For economies that have implemented Basel III: Ratio of Tier 1 capital to total exposure.	– Supervisory data on Tier 1 capital, and balance sheet data on total assets. – Average of monthly leverage ratio over the quarter.	– Same as Tier 1 capital to RWA. – For Basel III leverage ratio, exposure includes both on and off balance-sheet items.

iii. Bank Nonperforming Loans to Total Gross Loans Ratio of total NPLs to total gross loans.	– Supervisory data on NPLs and balance sheet data on total gross loans.	– Loans exclude accrued interest on NPLs.
iv. Bank Provisions to Nonperforming Loans Ratio of provisions on NPLs to total NPLs.	– Supervisory data on NPLs and balance sheet data on specific provisions.	– On specific provisions, same as in NPLs net of specific provisions to capital.
v. Return on Assets Ratio of net income to total (financial and nonfinancial) assets.	– Balance sheet data on total assets, and income and expense data on net income	– Annualization method for income should be reported in the metadata. – Total assets are the average of stocks from the beginning of the year until the end of the reporting period. – Gains and losses on the sale of an associate or subsidiary are excluded from income.
vi. Return on Equity Ratio of net income to total capital and reserves	– Balance sheet data on equity (capital and reserves), and income and expense data on net income.	– Annualization method for income should be reported in the metadata. – Total assets are the average of stocks from the beginning of the year until the end of the reporting period. – Gains and losses on the sale of an associate or subsidiary are excluded from income.

Source: IMF FSI Compilation Guide 2019

As in cases of UNDP indexes we initially develop the dimensional index for each dimension of financial soundness indicator for banks in a country. The dimension index for the *i*th dimension, *d_i*, is computed by the following formula.

$$d_i = \frac{A_i - \min_i}{\max_i - \min_i}$$

where, *A_i* The Actual value of dimension *i*
min_i The minimum value of dimension *i*
max_i The Maximum value of dimension *i*

This formula ensures that the value of *d_i* lies between 0 and 1. Higher the value of *d_i* higher is the achievement of the country in respect to that dimension of the financial soundness indicator. For this purpose the original indicator of FSI of Non performing loans to Total Loans is measured as the value of Good loans to the total loans.

In the *n*-dimensional space, the point O = (0,0,0,...0) represents the point indicating the worst situation while the point I = (1,1,1,...,1) represents the highest achievement in all dimensions. The Banking system stability index (BSSI) for the *i*th country is then measured as the normalised inverse normalized inverse Euclidean distance of the point *d_i* from the ideal point I= (1,1,1,...,1). The calculation for the BSSI is as follows

$$BSSI_i = 1 - \frac{\sqrt{(1-d_1)^2 + (1-d_2)^2 + (1-d_3)^2 + (1-d_4)^2 + (1-d_5)^2 + (1-d_6)^2}}{\sqrt{n}} = 1 - \frac{\sqrt{D}}{\sqrt{n}}$$

where, *d_i* the *i*th dimension of the financial soundness indicators
n total number of dimensions used in the index here it is 6

Here in this formula for BSSI the numerator of the second component is the Euclidean distance of *d_i* from the ideal point I, normalizing it by *n* and subtracting by 1 gives the inverse normalized distance. The normalization is

done in order to make the value lie between 0 and 1 and the inverse distance is considered so that higher value of the BSSI which would correspond to higher stability in the banking system.

The individual financial soundness indicators are studied for their mean values represented by the group of countries and variance observed in the group. The BSSI is then developed by using the financial stability indicators for 2010 to 2018 and the countries are ranked in each group. To evaluate all the indicators certain countries like Japan, Germany, United States and other do not have one or the other indicator and hence could not be included in the development of the BSSI and the ranking are obtained for the country classifications and the for the overall banking system.

IV. Empirical Results and Discussion

The financial soundness indicators (FSI) available in the World Bank Global Financial Stability Report are available till 2018 (beginning 2010 for a period of 9 years). Each indicator is to be evaluated to understand how they stand for the specific two groups and further classifications.

4.1 Financial Soundness Indicator Assessment of Different Group of Countries and over Time Span

4.1.1 Banking Regulatory Capital to Risk Weighted Assets

Table III (A to C) and Figure 6 shows that the mean of Bank Regulatory Capital to Risk Weighted Assets has increased in Advanced Economies from 2010 to 2018 by 29.23%; for Central and Eastern Europe by 14.97%; for Sub Saharan Africa by 11.41% and for Western Hemisphere by 0.73%. While it decreased for the same period by 16.54% for Commonwealth for independent states; by 3.74% for Developing Asia and by 0.77% for Middle East and North Africa. The country wise descriptive statistics and year wise descriptive statistics is available in Table III(B) and Table III(C). As per Table III(B) given the p-value and f-value there is a no significant difference between means of different years Bank Regulatory Capital over years which can be at 5% level of significance. As per Table III (C) the p-value and f-values indicate that there is significant difference between the group classifications in the Means of the Bank Regulatory Capital to Risk Weighted Asset at 5% level of significance.

Table III A
Mean of Bank Regulatory Capital to Risk Weighted Asset

	2010	2011	2012	2013	2014	2015	2016	2017	2018	Means	2010-18
Increase/ Decrease											
Advanced Economies	14.61	14.51	14.98	16.03	17.25	18.10	18.79	19.08	18.89	29.23	+
Central and Eastern Europe	16.28	16.14	16.85	17.15	17.92	18.27	18.11	18.49	18.72	14.97	+
Commonwealth of Independent States	21.89	21.14	19.14	17.99	15.83	16.63	17.53	19.49	18.27	(16.54)	-
Developing Asia	19.17	17.55	19.53	20.43	20.55	19.92	19.57	19.11	18.46	(3.74)	-
Middle East and North Africa	18.48	18.92	17.83	18.12	17.66	17.28	18.52	18.58	18.34	(0.77)	-
Sub-Saharan Africa	17.30	17.60	18.31	19.34	19.06	18.76	19.00	19.57	19.28	11.41	+
Western Hemisphere	16.58	16.54	16.76	16.00	16.10	15.89	16.53	16.84	16.70	0.73	+

Source: Self Computed

Table III B
ANOVA Test for Differences of Mean over Years

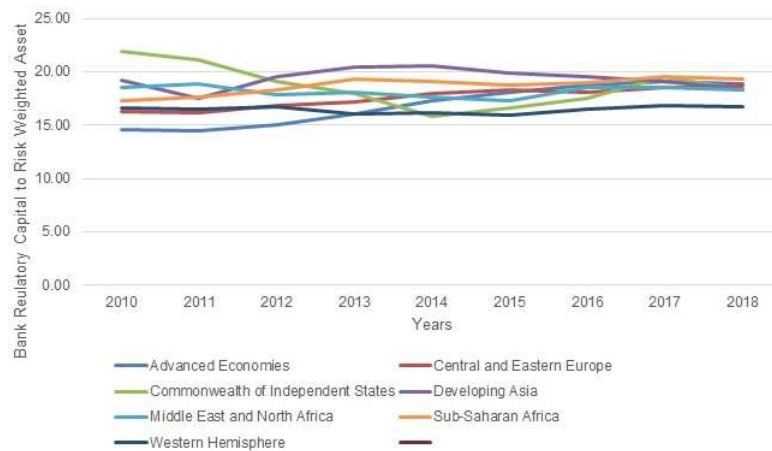
ANOVA Source of Variation	SS	Df	MS	F	P-value	F crit
Between Groups	9.272607	8	1.159076	0.467712	0.873444	2.115223
Within Groups	133.821800	54	2.478182			
Total	143.094400	62				

Source: Self Computed

Table III C
ANOVA Test for Differences in Groups of Economies

ANOVA Source of Variation	SS	Df	MS	F	P-value	F crit
Between Groups	59.59435	6	9.932392	6.661239	2.34E-05	2.265567
Within Groups	83.50007	56	1.491073			
Total	143.0944	62				

Source: Self Computed



Source: Self Formulated

Figure 6
Banking Regulatory Capital to Risk Weighted Assets

4.1.2 Banking Capital to Total Assets

Table IV (A to C) and Figure 7 shows that the mean of Bank Capital to Total Assets is on an increase by 29.92% in Advanced Economies over a period from 2010 to 2018; by 7.14% in Central and Eastern Economies; by 4.45% in Middle East and North Africa Economies; by 17% in Sub Saharan Africa and by 3.77% increase in Western Hemispheres. While we see a decrease in Common Wealth of Independent States by 14.37% and in Developing Asia by 0.049%. Table IV (B) the p-value and f-values shows that there is no significant differences in the means of the Bank Capital to Total Assets in the different years at 5% level of significance. Table IV (C) values of p-value and f-value indicates that there is significant difference in the groups for the Bank Capital to Total Assets.

Table IV A
Mean of Bank Capital to Total Assets

Increase/ Decrease	2010	2011	2012	2013	2014	2015	2016	2017	2018	Means	2010-18
Advanced Economies	6.60	6.54	6.87	7.30	7.93	8.31	8.25	8.62	8.58	29.920	+
Central and Eastern Europe	10.32	10.56	10.90	10.80	11.10	11.10	11.03	11.29	11.06	7.140	+
Commonwealth of Independent States	15.29	14.75	14.86	14.29	12.73	12.20	12.75	13.44	13.09	(14.370)	-
Developing Asia	11.53	10.78	11.99	12.07	11.96	11.93	11.62	11.49	11.52	(0.049)	-
Middle East and North Africa	10.31	9.39	8.59	9.35	9.77	10.02	10.70	10.74	10.77	4.450	+
Sub-Saharan Africa	10.41	11.24	11.42	11.68	11.51	12.06	12.12	12.05	12.18	17.000	+
Western Hemisphere	10.59	10.55	10.68	10.50	10.52	10.37	10.57	10.91	10.99	3.770	+

Source: Self Computed

Table IV B
ANOVA for Mean Differences over Years

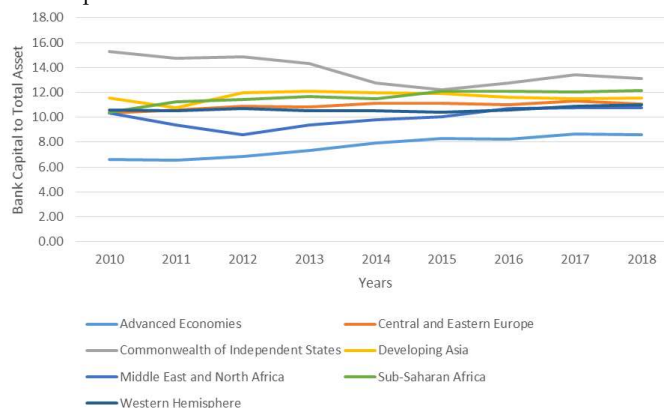
ANOVA	SS	Df	MS	F	P-value	F crit
Source of Variation						
Between Groups	2.650253	8	0.331282	0.086821	0.999453	2.115223
Within Groups	206.046200	54	3.815671			
Total	208.696500	62				

Source: Self Computed

Table IV C
Anova for Mean Difference over Different Groups

ANOVA	SS	Df	MS	F	P-value	F crit
Source of Variation						
Between Groups	183.6104	6	30.60174	68.3128	5.88E-24	2.265567
Within Groups	25.08604	56	0.447965			
Total	208.6965	62				

Source: Self Computed



Source: Self Formulated

Figure 7
Bank Capital to Total Assets

4.1.3 Non Performing Loans to Total Asset

Table V (A to C) and Figure 8 shows that the mean of Non-Performing Loans to Total Asset has seen the highest increase by 38.08% in Commonwealth of Independent States for a period of 2010 to 2018; by 25.37% in Developing Asia; by 42.63% in Sub Saharan Africa; by 17% in Advanced Economies. However, there is a decrease of 10.49% in Western Hemisphere; by 46.82% in Central and Eastern Europe; by 47.76% in Middle East and North Africa. Table V (B) indicates with p-value and f-values that there is no significant difference in the different years for means of the non-performing

assets to total assets at 5% level of significance. Table V (C) indicates with p-value and f-value that there is significant difference in the means of non-performing assets to total asset in the group divisions.

Table V A
Means of Non-Performing Loans to Total Loans

Increase/ Decrease	2010	2011	2012	2013	2014	2015	2016	2017	2018	Means	2010-18
Advanced Economies	4.76	5.92	6.44	7.97	7.97	8.05	7.01	6.65	5.57	17	+
Central and Eastern Europe	10.62	11.55	12.81	13.48	12.26	10.61	8.72	6.79	5.65	(46.82)	-
Commonwealth of Independent States	8.74	8.07	9.09	8.66	9.63	10.26	10.84	14.31	12.07	38.08	+
Developing Asia	3.60	3.40	5.20	5.39	5.00	4.60	4.27	4.54	4.51	25.37	+
Middle East and North Africa	15.71	7.16	7.29	7.32	7.75	7.94	8.30	7.81	8.21	(47.76)	-
Sub-Saharan Africa	7.79	6.09	6.21	7.70	7.66	8.72	10.81	11.37	11.11	42.63	+
Western Hemisphere	2.80	2.57	2.61	2.44	2.41	2.46	2.57	2.60	2.51	(10.49)	-

Source: Self Computed

Table V B
Anova for Testing the difference in Years for Non-Performing Loans to Total Assets

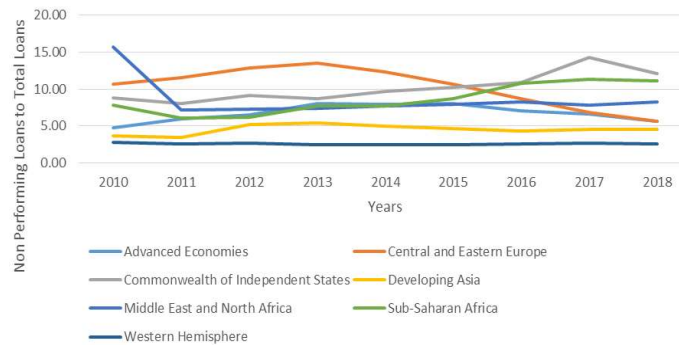
ANOVA Source of Variation	SS	Df	MS	F	P-value	F crit
Between Groups	10.13691	8	1.267114	0.105646	0.998878	2.115223
Within Groups	647.6762	54	11.994			
Total	657.8131	62				

Source: Self Computed

Table V C
ANOVA for Testing Differences in Means for Non-Performing Loans to Total Assets

ANOVA Source of Variation	SS	Df	MS	F	P-value	F crit
Between Groups	462.0717	6	77.01196	22.03249	4.02E-13	2.265567
Within Groups	195.7414	56	3.495382			
Total	657.8131	62				

Source: Self Computed



Source: Self Formulated

Figure 8
Non-Performing Loans to Total Loans

4.1.4 Bank Provision to Non-Performing Loans

Table VI (A to C) and Figure 9 shows that the mean of Bank Provision to Non-Performing Loans have seen a changes of increased provisioning by 15.15% in Central and Eastern Europe from 2010 to 2018; by 10.93% in Commonwealth of Independent States; by 8.34% in Developing Asia; by 7.67% in Advanced Economies. The Provisioning has decreased by 10.73%

in Sub Saharan Africa, by 1.61% in Western Hemisphere; and by 1.19% in Middle East and North Africa. Table VI (B) through p and f values indicates that there is no significant differences in the means of the Bank provision to Non-performing loans over different years at 5% level of significance. Table VI (C) through p and f values indicates that there is significant difference in the means of the Bank Provision to Non-performing Loans over groups.

Table VI A
Means of Bank Provision to Non-Performing Loans

Increase/ Decrease	2010	2011	2012	2013	2014	2015	2016	2017	2018	Means	2010-18
Advanced Economies	39.18	38.07	39.73	38.34	40.11	40.87	40.62	41.52	42.19	7.67	+
Central and Eastern Europe	60.81	64.05	64.51	66.17	64.17	67.28	71.87	71.53	70.02	15.15	+
Commonwealth of Independent States	56.28	56.13	55.24	53.76	54.21	53.71	56.72	60.43	62.43	10.93	+
Developing Asia	58.76	63.17	61.35	67.82	60.01	60.43	60.23	58.92	63.66	8.34	+
Middle East and North Africa	82.52	75.40	76.57	78.33	80.98	79.24	82.15	74.00	81.53	(1.19)	-
Sub-Saharan Africa	62.36	67.92	65.11	58.33	59.77	57.52	56.61	58.44	55.67	(10.73)	-
Western Hemisphere	113.42	117.49	113.28	114.21	110.92	108.65	106.65	107.85	111.59	(1.61)	-

Source: Self Computed

Table VI B
ANOVA Table For Difference in Bank Provision to Non Performing Loans over different Years

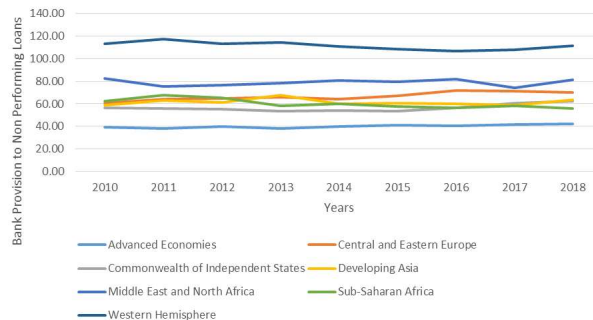
ANOVA Source of Variation	SS	Df	MS	F	P-value	F crit
Between Groups	40.60251	8	5.075314	0.009847	1	2.115223
Within Groups	27833.13	54	515.4282			
Total	27873.73	62				

Source: Self Computed

Table VI C
ANOVA Table for Differences in Bank Provision to Non Performing Loans over different Groups

ANOVA Source of Variation	SS	Df	MS	F	P-value	F crit
Between Groups	27296.2000	6	4549.366	441.1266	3.02E-45	2.265567
Within Groups	577.5315	56	10.31306			
Total	27873.7300	62				

Source: Self Computed



Source: Self Formulated

Figure 9
Bank Provision to Non-Performing Loans

4.1.5 Bank Return on Asset

Table VII (A to C) and Figure 10 shows that the mean of Bank Return on Asset has seen a jump by 299.91 % in Middle East and North Africa from

2010 to 2018 period; by 53.03% in Central and Eastern Europe; by 49.79% jump in Advanced Economies; by 28.78% jump in Commonwealth of Independent States and by 1.70 % in Western Hemisphere. The Bank Return on Assets has declined by 23.01 % in Developing Asia and 12.21% in Sub Saharan Africa. Table VII (B) the p-value and f-values indicate that there is no significant differences in the means of the different years at 5% level of Significance. Table VII (C) p-value and f-value indicates that there is significant differences in the means of the groups.

Table VII A
Bank Return on Assets

	2010	2011	2012	2013	2014	2015	2016	2017	2018	Means	2010-18
Increase/Decrease											
Advanced Economies	0.38	-0.08	0.19	0.26	0.51	0.71	0.73	0.70	0.76	49.79	+
Central and Eastern Europe	0.73	0.80	0.68	0.69	0.61	0.91	1.40	1.52	1.54	53.03	+
Commonwealth of Independent States	1.47	1.58	1.49	1.77	0.59	0.68	0.06	1.18	2.09	28.78	+
Developing Asia	2.07	1.98	1.92	2.13	1.89	1.81	1.79	1.54	1.68	(23.01)	-
Middle East and North Africa	-2.82	1.33	1.42	1.48	1.49	1.30	1.44	1.29	1.41	299.91	+
Sub-Saharan Africa	2.90	2.97	3.12	2.70	2.70	2.82	2.52	2.71	2.59	(12.21)	-
Western Hemisphere	2.03	2.07	2.06	2.02	1.99	1.98	1.80	1.81	2.06	1.70	+

Source : Self Computed

Table VII B
ANOVA for Difference in Means of Return on Assets for different Years

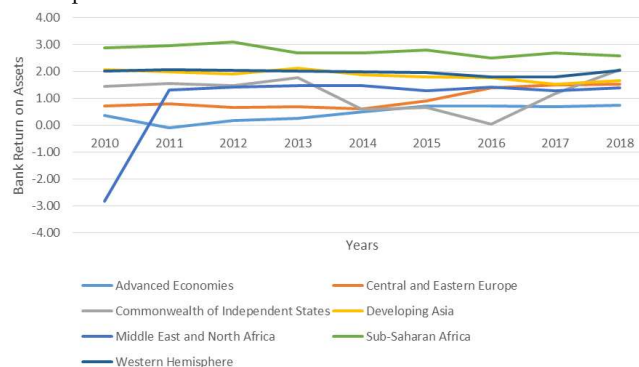
ANOVA Source of Variation	SS	Df	MS	F	P-value	F crit
Between Groups	2.536268	8	0.317033	0.323427	0.953585	2.115223
Within Groups	52.93246	54	0.980231			
Total	55.46873	62				

Source : Self Computed

Table VII C
ANOVA for Differences in Means of Return on Assets for Groups

ANOVA Source of Variation	SS	Df	MS	F	P-value	F crit
Between Groups	33.68387	6	5.613979	14.43126	7.24E-10	2.265567
Within Groups	21.78486	56	0.389015			
Total	55.46873	62				

Source : Self Computed



Source: Self Formulated

Figure 10
Bank Return on Assets

4.1.6 Bank Return on Equity

Table VIII (A to C) and Figure 11 shows that the mean of Bank Return on Equity increased by 115.12% in Central and Eastern Europe from 2010 to 2018; by 61.86% in Commonwealth of Independent States; 35.93% in Advanced Economies. There is decrease by 118.29% in Middle East and Africa countries from 2010 to 2018; by 20.514% in Sub Saharan Africa and 18.01% in Developing Asia; and 0.582% in Western Hemisphere. Table VIII (B) with the p-value and f-values indicates that there is no significant differences in the mean of Bank Return on Equity over years at 5% level of significance. Table VIII (C) with the p-value and f-value indicates that there is significant difference in the country-wise groups.

Table VIII A
Bank Return on Equity

Increase/ Decrease	2010	2011	2012	2013	2014	2015	2016	2017	2018	Means	2010-18
Advanced Economies	6.67	3.29	3.96	3.30	6.50	8.54	8.85	8.65	9.06	35.930	+
Central and Eastern Europe	6.47	7.30	6.11	6.43	5.41	8.58	12.47	13.63	13.92	115.120	+
Commonwealth of Independent States	9.70	10.90	10.14	12.00	4.54	2.29	-2.96	8.26	15.70	61.860	+
Developing Asia	17.20	17.92	16.43	17.43	15.96	14.51	14.74	12.74	14.10	(18.010)	-
Middle East and North Africa	-70.93	3.00	16.48	15.93	15.76	12.92	14.15	12.11	12.97	(118.290)	-
Sub-Saharan Africa	26.36	24.92	25.39	22.86	21.96	20.82	19.20	20.87	20.96	(20.514)	-
Western Hemisphere	17.64	18.36	18.04	18.04	17.51	17.77	15.78	15.83	17.74	(0.582)	-

Source: Self Computed

Table VIII B
ANOVA testing the Differences of Return to Equity in Years

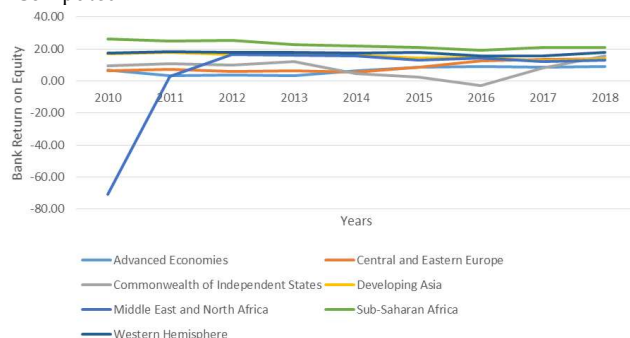
ANOVA Source of Variation	SS	Df	MS	F	P-value	F crit
Between Groups	830.6112	8	103.8264	0.654677	0.72834	2.115223
Within Groups	8563.953	54	158.5917			
Total	9394.564	62				

Source: Self Computed

Table VIII C
ANOVA testing Differences of Return on Equity between Countrywise Groups

ANOVA Source of Variation	SS	Df	MS	F	P-value	F crit
Between Groups	2536.953	6	422.8254	3.452839	0.005675	2.265567
Within Groups	6857.611	56	122.4573			
Total	9394.564	62				

Source: Self Computed



Source: Self Formulated

Figure 11
Bank Return on Equity

4.1.7 FSI Overall Assessment of Different Group of Countries and over Time Span

In the overall assessment of FSIs it has been found that there does exist distinct difference in the means of the different groups of countries formed by the classification of IMF for banking financial soundness indicator. However, over the years the Banking System financial soundness indicators are found to have not significantly changed over years. The ranking hence for the banking system can be assessed along with classification to meet for the economic development, regulatory and supervision differences along with transparency and other macroeconomic aggregates as specified by IMF so we attempt to rank the system through these financial soundness indicator which this paper attempts through the Banking System stability Index for the advanced and developing countries.

4.2 BSSI Calibration and Ranking of Countries

We present in the following tables (Table IX to Table XVII) the Dimension values calculated for developing the Banking System Stability Indicator (BSSI) and Ranks of the different countries. While calculating the final index for some countries in different years the data for all 6 financial soundness indicators was not available and hence these countries were not included in developing the BSSI and also in ranking these countries. It is found that on the basis of Moody's Rating and Financial Soundness Indicators (FSI) the macroeconomic profile of the countries also effect the overall strength of the economies banking system. The exchange rate, GDP, per capita incomes, balance of payment status, foreign exchange reserves and overall global financial integration and other asset prices contribute to the financial soundness of the financial system to which the banking system is a component. However, in this study we take the 6 indicators for bank system health which define the overall banking health. We use the IMF classification of the countries to proxy for the other indicators. However, if we look at the entire set of the financial soundness indicators the results of the overall ranking would differ primarily because the strength of the system is directly a result of the Banking specific indicators which are used to measure the global financial stability. However, these indicators do not have benchmarks which can define the financial health of the economy and hence it was not needed to collect GDP data, inflation, current account deficit and other and evaluate if they were bringing strength or weakness in the economy. Though the classification based on the IMF category does give an idea of the perception of the strength of the economies which is used in the study to Rank Countries through 2010 to 2018 within their groups. The overall ranking indicators is also made available to understand that on these 6 indicators how the countries fair for these are important indicator for global financial stability. The surprising results where the advanced economies fairly low is dependent on the 6 financial indicators only and not overall financial soundness indicators as data from IMF sources are also not complete to cover in this study. The results are given in the following Tables from Table IX to Table XVII.

4.2.1 BSSI and Ranking of Countries for Year 2010

Table IX
BSSI and Ranking of Countries for Year 2010

2010	D1	D2	D3	D4	D5	D6	D	BSSI	Rank within Country Groups	Overall Ranking
World										
Advanced Economies										
Australia	0.34	0.89	0.96	0.07	0.89	0.77	1.38	0.5202	25	98
Austria	0.48	0.90	0.95	0.32	0.90	0.78	0.81	0.6331	1	40
Belgium	0.61	0.90	0.95	0.20	0.90	0.78	0.85	0.6229	3	52
Canada	0.48	0.93	0.98	0.08	0.93	0.80	1.16	0.5597	17	89
Cyprus	0.37	0.91	0.90	0.19	0.91	0.79	1.13	0.5655	15	82
Czech Republic	0.47	0.92	0.91	0.20	0.92	0.80	0.98	0.5957	9	70
Denmark	0.50	0.89	0.93	0.25	0.89	0.77	0.91	0.6114	4	58
Estonia	0.71	0.89	0.91	0.18	0.89	0.78	0.83	0.6270	2	46
France	0.38	0.91	0.94	0.28	0.91	0.78	0.97	0.5982	8	69
Greece	0.37	0.89	0.84	0.17	0.89	0.77	1.19	0.5549	18	90
Ireland	0.44	0.81	0.77	0.16	0.81	0.69	1.24	0.5457	22	94
Italy	0.36	0.89	0.83	0.16	0.89	0.78	1.22	0.5488	21	93
Korea	0.44	0.90	0.99	0.15	0.90	0.79	1.10	0.5721	13	80
Latvia	0.42	0.85	0.72	0.16	0.85	0.71	1.24	0.5453	23	95
Luxembourg	0.55	0.91	1.00	0.16	0.91	0.79	0.96	0.5991	6	66
Malta	0.45	0.92	0.88	0.09	0.92	0.81	1.20	0.5531	19	91
Norway	0.43	0.91	0.97	0.12	0.91	0.80	1.15	0.5615	16	86
Portugal	0.30	0.90	0.91	0.27	0.90	0.78	1.10	0.5718	14	81
San Marino	0.48	0.88	0.79	0.09	0.88	0.76	1.21	0.5504	20	92
Singapore	0.59	0.91	0.98	0.16	0.91	0.81	0.93	0.6056	5	62
Slovak Republic	0.38	0.91	0.90	0.24	0.91	0.80	1.02	0.5872	11	75
Slovenia	0.33	0.88	0.86	0.14	0.88	0.76	1.29	0.5366	24	96
Spain	0.35	0.90	0.92	0.29	0.90	0.78	0.99	0.5931	10	72
Switzerland	0.53	0.89	0.98	0.18	0.89	0.77	0.96	0.5990	7	67
United Kingdom	0.49	0.90	0.93	0.13	0.90	0.78	1.08	0.5751	12	79
Emerging and Developing Economies										
Central and Eastern Europe										
Bosnia and Herzegovina	0.50	0.88	0.80	0.18	0.88	0.75	1.06	0.5801	8	78
Bulgaria	0.54	0.90	0.79	0.27	0.90	0.79	0.85	0.6243	5	49
Croatia	0.59	0.90	0.81	0.15	0.90	0.80	0.98	0.5956	7	71
Hungary	0.42	0.89	0.83	0.15	0.89	0.77	1.16	0.5603	9	88
Kosovo	0.59	0.91	0.90	0.39	0.91	0.81	0.60	0.6839	2	18
Lithuania	0.46	0.88	0.60	0.13	0.88	0.76	1.31	0.5327	10	97
Macedonia, FYR	0.50	0.90	0.84	0.48	0.90	0.79	0.61	0.6805	3	22
Poland	0.42	0.91	0.92	0.33	0.91	0.80	0.85	0.6235	6	51
Romania	0.46	0.88	0.79	0.37	0.88	0.76	0.81	0.6330	4	41
Turkey	0.60	0.93	0.94	0.39	0.93	0.86	0.57	0.6919	1	16
Commonwealth of Independent States										
Armenia	0.71	0.91	0.95	0.07	0.91	0.85	1.00	0.5927	9	73
Belarus	0.65	0.91	0.94	0.13	0.91	0.83	0.92	0.6081	8	60
Georgia	0.54	0.91	0.90	0.30	0.91	0.83	0.76	0.6451	4	38
Kazakhstan	0.54	0.93	0.64	0.29	0.93	0.85	0.88	0.6162	7	55
Moldova	0.99	0.89	0.77	0.17	0.89	0.78	0.82	0.6309	6	42
Russia	0.57	0.91	0.86	0.34	0.91	0.83	0.68	0.6628	3	31
Tajikistan	0.88	0.89	0.87	0.33	0.89	0.79	0.54	0.6995	1	15
Ukraine	0.66	0.87	0.74	0.30	0.87	0.72	0.79	0.6376	5	39
Uzbekistan	0.76	0.91	0.98	0.26	0.91	0.82	0.66	0.6685	2	27
Developing Asia										
Brunei Darussalam	0.67	0.91	0.88	0.29	0.91	0.82	0.68	0.6642	3	30
Cambodia	1.00	0.90	0.95	0.22	0.90	0.82	0.66	0.6678	2	29
China	0.36	0.92	0.98	0.60	0.92	0.80	0.62	0.6791	1	23
Fiji	0.62	0.92	0.92	0.14	0.92	0.85	0.93	0.6062	9	61
India	0.47	0.90	0.96	0.25	0.90	0.80	0.91	0.6098	8	59
Indonesia	0.50	0.93	0.96	0.25	0.93	0.85	0.85	0.6241	7	50

Macao	0.44	0.92	0.99	0.43	0.92	0.79	0.69	0.6606	4	32
Malaysia	0.55	0.91	0.94	0.12	0.91	0.81	1.04	0.5836	12	77
Philippines	0.52	0.91	0.94	0.32	0.91	0.82	0.74	0.6491	5	35
Solomon Islands	0.92	0.96	0.84	0.04	0.96	1.00	0.97	0.5984	11	68
Thailand	0.50	0.91	0.93	0.19	0.91	0.81	0.96	0.6004	10	65
Vanuatu	0.80	0.92	0.92	0.18	0.92	0.84	0.75	0.6464	6	37
Vietnam	0.33	0.92	0.96	0.18	0.92	0.81	1.16	0.5603	13	87
Middle East and North Africa										
Algeria	0.76	0.93	0.68	0.33	0.93	0.83	0.64	0.6736	3	24
Lebanon	0.41	0.00	0.00	0.00	0.00	0.77	4.41	0.1430	6	99
Pakistan	0.43	0.90	0.74	0.30	0.90	0.80	0.95	0.6024	5	64
Saudi Arabia	0.55	0.91	0.95	0.59	0.91	0.83	0.42	0.7357	1	7
United Arab Emirates	0.61	0.90	0.91	0.29	0.90	0.81	0.72	0.6542	4	34
West Bank and Gaza	0.69	0.92	0.95	0.32	0.92	0.83	0.61	0.6815	2	21
Sub-Saharan Africa										
Burundi	0.63	0.94	0.84	0.41	0.94	0.88	0.54	0.6997	3	14
Cameroon	0.24	0.92	0.83	0.39	0.92	0.80	1.02	0.5868	17	76
Central African Republic	0.51	0.93	0.78	0.46	0.93	0.88	0.60	0.6834	5	19
Chad	0.38	0.94	0.83	0.37	0.94	0.87	0.84	0.6269	12	47
Congo	0.39	0.94	0.98	0.50	0.94	0.84	0.65	0.6714	7	25
Equatorial Guinea	0.64	0.90	0.92	0.54	0.90	0.80	0.41	0.7394	1	5
Gabon	0.80	0.91	0.95	0.42	0.91	0.85	0.41	0.7377	2	6
Ghana	0.61	0.92	0.69	0.32	0.92	0.88	0.74	0.6476	9	36
Kenya	0.66	0.94	0.89	0.00	0.94	0.90	1.14	0.5641	20	85
Lesotho	0.45	0.96	0.95	0.25	0.96	0.88	0.88	0.6177	14	54
Madagascar	0.48	0.92	0.83	0.26	0.92	0.83	0.89	0.6154	15	57
Mauritius	0.50	0.92	0.95	0.20	0.92	0.81	0.94	0.6038	16	63
Namibia	0.47	0.94	0.97	0.45	0.94	0.86	0.61	0.6824	6	20
Rwanda	0.80	0.92	0.87	0.14	0.92	0.86	0.83	0.6285	10	43
Seychelles	0.69	0.94	0.91	0.00	0.94	0.86	1.13	0.5653	19	84
South Africa	0.46	0.92	0.90	0.12	0.92	0.80	1.13	0.5655	18	83
Swaziland	0.74	0.94	0.86	0.15	0.94	0.87	0.83	0.6284	11	45
Tanzania	0.57	0.91	0.86	0.23	0.91	0.82	0.85	0.6247	13	48
Uganda	0.64	0.93	0.97	0.29	0.93	0.87	0.66	0.6679	8	28
Zambia	0.71	0.93	0.74	0.37	0.93	0.83	0.59	0.6870	4	17
Western Hemisphere										
Argentina	0.55	0.95	0.96	0.70	0.95	0.89	0.31	0.7724	4	4
Brazil	0.53	0.91	0.95	0.81	0.91	0.82	0.31	0.7737	3	3
Chile	0.43	0.92	0.95	0.43	0.92	0.82	0.69	0.6605	12	33
Colombia	0.54	0.93	0.95	0.87	0.93	0.87	0.26	0.7927	1	1
Costa Rica	0.55	0.90	0.97	0.49	0.90	0.80	0.52	0.7047	10	13
Dominican Republic	0.50	0.92	0.95	0.61	0.92	0.83	0.45	0.7266	5	8
Ecuador	0.58	0.90	0.94	0.54	0.90	0.81	0.45	0.7259	6	9
El Salvador	0.56	0.90	0.93	0.51	0.90	0.79	0.50	0.7122	8	11
Guatemala	0.49	0.92	0.96	0.28	0.92	0.83	0.83	0.6284	13	44
Honduras	0.47	0.92	0.94	0.57	0.92	0.82	0.51	0.7076	9	12
Mexico	0.53	0.91	0.96	1.00	0.91	0.82	0.27	0.7869	2	2
Panama	0.50	0.91	0.95	0.24	0.91	0.82	0.89	0.6157	15	56
Paraguay	0.39	0.94	0.98	0.50	0.94	0.85	0.65	0.6713	11	26
Peru	0.43	0.93	0.95	0.66	0.93	0.84	0.49	0.7147	7	10
Trinidad and Tobago	0.78	0.92	0.89	0.12	0.92	0.84	0.87	0.6197	14	53
Uruguay	0.43	0.90	0.96	0.21	0.90	0.79	1.02	0.5883	16	74

Source: Self Computed

In 2010 the following countries namely in Advanced Economies namely Finland, Germany, Hongkong, SAR, Japan, Netherlands, Sweden and United States could not be considered for lack of one or the other indicator. Amongst Developing Asia namely Bangladesh, Bhutan, Maldives, Myanmar, Somoa, and Tonga could not be considered for missing information on one of the indicators. In Middle East and North Africa namely Afghanistan and United Arab Emirates could not be considered. Sub Saharan Africa namely Bostawana and Guinea could not be considered for the same reason.

In overall BSSI based Ranking of the countries in Table IX that faired the first three top ranks are Columbia, Mexico and Brazil respectively. The countries that fared poorly are Australia, Lithuania and Slovenia with 98, 97 and 96 ranks respectively. In group wise classification in Advanced Economies the first rank went to Austria and the last rank went to Slovenia. Among the Central and Eastern Europe the first rank went to Turkey and the last rank went to Lithuania. Among Commonwealth of Independent States the first rank went to Tajikistan and the last rank went to Armenia. Among Developing Asia the first rank went to China and last rank to Vietnam. Middle East and North Africa the first rank went to Saudi Arabia and the last rank to Lebanon. Among Sub Saharan Africa the first rank went to Equatorial Guinea and the last rank went to Kenya. In Western Hemisphere the first rank went to Columbia and the last rank to Uruguay.

4.2.2 BSSI and Ranking of Countries for Year 2011

Table X
BSSI and Ranking of Countries for Year 2011

2011	D1	D2	D3	D4	D5	D6	D	BSSI	Rank within Country Groups	Overall Ranking
World										
Advanced Economies										
Australia	0.24	0.07	0.97	0.05	0.85	0.73	2.45	0.3610	19	93
Austria	0.41	0.17	0.95	0.32	0.67	0.65	1.73	0.4629	4	67
Belgium	0.51	0.03	0.94	0.18	0.67	0.65	2.08	0.4115	12	84
Canada	0.41	0.05	0.99	0.08	0.86	0.72	2.19	0.3952	15	89
Cyprus	0.26	0.07	0.83	0.15	0.16	0.38	3.26	0.2630	22	97
Czech Republic	0.37	0.14	0.91	0.19	0.81	0.73	1.91	0.4351	6	76
Denmark	0.46	0.06	0.94	0.20	0.65	0.64	2.07	0.4133	11	83
Estonia	0.52	0.27	0.93	0.16	0.94	0.88	1.50	0.5006	1	56
France	0.27	0.04	0.93	0.25	0.73	0.67	2.21	0.3936	16	90
Greece	0.19	0.09	0.75	0.17	0.43	0.00	3.56	0.2302	23	98
Ireland	0.53	0.13	0.72	0.16	0.57	0.58	2.11	0.4070	13	86
Israel	0.34	0.13	0.94	0.16	0.76	0.73	2.04	0.4173	8	80
Italy	0.28	0.08	0.80	0.14	0.55	0.59	2.52	0.3521	21	95
Korea	0.33	0.22	0.99	0.13	0.77	0.72	1.93	0.4323	7	78
Latvia	0.44	0.32	0.76	0.29	0.57	0.57	1.71	0.4656	3	65
Luxembourg	0.43	0.05	0.99	0.06	0.70	0.66	2.30	0.3807	18	92
Malta	0.39	0.18	0.88	0.06	0.81	0.73	2.04	0.4164	10	82
Portugal	0.17	0.07	0.87	0.22	0.61	0.62	2.47	0.3589	20	94
Singapore	0.42	0.24	0.98	0.13	0.78	0.72	1.81	0.4511	5	71
Slovak Republic	0.31	0.37	0.90	0.23	0.72	0.69	1.65	0.4753	2	62
Spain	0.26	0.10	0.90	0.24	0.67	0.65	2.17	0.3982	14	88
Switzerland	0.44	0.08	0.99	0.16	0.72	0.68	2.04	0.4166	9	81
United Kingdom	0.40	0.06	0.93	0.12	0.71	0.66	2.21	0.3932	17	91
Emerging and Developing Economies										
Central and Eastern Europe										
Bosnia & Herzegovina	0.46	0.52	0.80	0.29	0.71	0.69	1.25	0.5437	4	34
Bulgaria	0.48	0.37	0.74	0.25	0.71	0.69	1.49	0.5023	6	55
Croatia	0.59	0.52	0.79	0.15	0.73	0.73	1.32	0.5316	5	42
Kosovo	0.48	0.30	0.90	0.41	0.78	0.74	1.23	0.5467	3	33
Lithuania	0.35	0.37	0.67	0.12	0.81	0.76	1.81	0.4512	9	70
Macedonia, FYR	0.44	0.38	0.84	0.51	0.69	0.67	1.16	0.5595	2	30
Poland	0.30	0.21	0.92	0.32	0.79	0.73	1.70	0.4680	7	63
Romania	0.37	0.22	0.75	0.39	0.64	0.63	1.70	0.4676	8	64
Turkey	0.44	0.42	0.96	0.37	0.82	0.80	1.13	0.5654	1	28
Commonwealth of Independent States										
Armenia	0.50	0.72	0.94	0.05	0.77	0.81	1.31	0.5321	8	41
Belarus	0.76	0.54	0.93	0.12	0.82	0.79	1.12	0.5676	5	26
Georgia	0.46	0.69	0.92	0.32	0.82	0.86	0.92	0.6092	2	13
Kazakhstan	0.47	0.53	0.64	0.20	0.75	0.73	1.39	0.5185	9	47
Moldova	0.98	0.65	0.82	0.13	0.76	0.78	1.03	0.5859	3	21

Russia	0.36	0.43	0.89	0.33	0.80	0.81	1.26	0.5408	7	36
Tajikistan	0.75	0.83	0.88	0.37	0.64	0.62	0.78	0.6397	1	6
Ukraine	0.53	0.59	0.74	0.30	0.62	0.60	1.25	0.5437	6	35
Uzbekistan	0.74	0.45	0.99	0.25	0.78	0.77	1.04	0.5838	4	23
Developing Asia										
Bangladesh	0.21	0.16	0.90	0.30	0.95	0.86	1.86	0.4432	12	72
Bhutan	0.49	0.58	0.93	0.43	0.00	0.00	2.77	0.3202	16	96
Brunei Darussalam	0.53	0.27	0.90	0.34	0.76	0.72	1.35	0.5263	5	44
Cambodia	0.77	0.73	0.96	0.21	0.75	0.80	0.85	0.6233	2	10
China	0.28	0.00	0.98	0.83	0.83	0.73	1.64	0.4769	9	61
Fiji	0.44	0.30	0.93	0.15	0.84	0.83	1.60	0.4844	8	59
India	0.30	0.15	0.95	0.11	0.77	0.70	2.15	0.4020	15	87
Indonesia	0.42	0.38	0.96	0.26	0.87	0.84	1.32	0.5315	4	43
Macao	0.34	0.00	0.99	0.39	0.83	0.70	1.93	0.4335	14	77
Malaysia	0.48	0.27	0.95	0.09	0.80	0.75	1.74	0.4620	10	68
Philippines	0.46	0.39	0.96	0.30	0.79	0.75	1.27	0.5402	3	37
Solomon Islands	1.00	0.84	0.90	0.17	0.89	1.00	0.75	0.6473	1	4
Sri Lanka	0.42	0.26	0.93	0.24	0.90	0.81	1.53	0.4955	7	57
Thailand	0.37	0.21	0.95	0.20	0.78	0.75	1.78	0.4557	11	69
Tonga	0.00	0.23	0.00	0.00	0.78	0.82	3.68	0.2165	17	99
Vanuatu	0.48	0.44	0.86	0.22	0.70	0.69	1.39	0.5181	6	48
Vietnam	0.29	0.29	0.95	0.13	0.80	0.75	1.87	0.4416	13	73
Middle East and North Africa										
Algeria	0.72	0.21	0.75	0.32	0.87	0.79	1.28	0.5384	3	38
Lebanon	0.24	0.20	0.94	0.27	0.80	0.73	1.87	0.4413	4	75
Pakistan	0.36	0.00	0.72	0.29	0.79	0.74	2.10	0.4081	5	85
Saudi Arabia	0.48	0.44	0.96	0.67	0.79	0.79	0.79	0.6368	1	7
West Bank and Gaza	0.62	0.39	0.95	0.26	0.80	0.77	1.16	0.5598	2	29
Sub-Saharan Africa										
Burundi	0.56	0.50	0.87	0.37	0.98	0.98	0.85	0.6227	4	12
Central African Republic	0.79	1.00	0.79	0.44	0.86	0.99	0.42	0.7340	1	1
Chad	0.57	0.56	0.87	0.42	0.82	0.82	0.80	0.6355	3	8
Congo	0.17	0.17	0.98	0.45	0.95	0.79	1.72	0.4648	18	66
Equatorial Guinea	0.50	0.51	0.92	0.63	0.86	0.84	0.68	0.6635	2	3
Gabon	0.29	0.35	0.95	0.60	0.87	0.83	1.13	0.5662	9	27
Ghana	0.47	0.53	0.76	0.35	0.83	0.91	1.03	0.5865	6	19
Kenya	0.55	0.51	0.92	0.00	0.93	0.95	1.46	0.5066	16	53
Lesotho	0.40	0.33	0.96	0.31	1.00	0.91	1.29	0.5355	11	39
Madagascar	0.42	0.30	0.81	0.26	0.87	0.81	1.47	0.5050	17	54
Mauritius	0.40	0.18	0.95	0.15	0.81	0.73	1.87	0.4415	19	74
Namibia	0.34	0.21	0.97	0.54	0.93	0.86	1.30	0.5343	12	40
Nigeria	0.49	0.36	0.90	0.28	0.69	0.66	1.41	0.5156	13	49
Rwanda	0.77	0.63	0.90	0.13	0.79	0.86	1.02	0.5887	5	18
Seychelles	0.74	0.27	0.86	0.10	0.95	0.87	1.44	0.5102	15	52
South Africa	0.38	0.18	0.92	0.11	0.84	0.75	1.96	0.4289	20	79
Swaziland	0.60	0.45	0.94	0.27	0.88	0.88	1.03	0.5860	7	20
Tanzania	0.46	0.33	0.91	0.22	0.83	0.81	1.42	0.5133	14	50
Uganda	0.58	0.48	0.96	0.20	0.96	1.00	1.08	0.5754	8	24
Zambia	0.54	0.27	0.82	0.35	0.96	0.88	1.22	0.5491	10	32
Western Hemisphere										
Argentina	0.40	0.39	0.98	0.89	0.97	0.91	0.75	0.6456	2	5
Brazil	0.43	0.33	0.94	0.78	0.79	0.76	0.92	0.6075	5	14
Chile	0.33	0.21	0.96	0.48	0.83	0.75	1.44	0.5106	14	51
Colombia	0.45	0.56	0.96	0.96	0.85	0.87	0.54	0.7003	1	2
Costa Rica	0.48	0.33	0.97	0.50	0.74	0.74	1.11	0.5700	10	25
Dominican Republic	0.47	0.30	0.95	0.61	0.79	0.77	1.03	0.5858	9	22
Ecuador	0.50	0.44	0.94	0.59	0.76	0.76	0.85	0.6229	4	11
El Salvador	0.47	0.54	0.94	0.53	0.75	0.75	0.84	0.6264	3	9
Guatemala	0.39	0.14	0.97	0.33	0.85	0.79	1.63	0.4794	16	60
Honduras	0.38	0.35	0.95	0.69	0.83	0.78	0.97	0.5971	7	16
Mexico	0.40	0.32	0.96	1.00	0.79	0.75	0.93	0.6073	6	15
Panama	0.38	0.39	0.96	0.28	0.78	0.76	1.38	0.5208	13	46
Paraguay	0.37	0.18	0.97	0.49	0.92	0.83	1.36	0.5237	12	45
Peru	0.32	0.36	0.95	0.73	0.86	0.80	1.00	0.5909	8	17
Trinidad and Tobago	0.77	0.54	0.89	0.07	0.80	0.81	1.21	0.5502	11	31
Uruguay	0.42	0.33	0.97	0.20	0.75	0.72	1.57	0.4881	15	58

Source: Self Computed

In 2011 the following countries namely in Advanced Economies namely Finland, Germany, Hongkong SAR, Japan, Netherlands, Norway, San Marino, Slovenia, Sweden and United States could not be considered for lack of one or the other indicator. Amongst the Central and Eastern Europe namely Hungary could not be considered. In Developing Asia namely Maldives, Myanmar and Samoa could not be considered for missing information on one of the indicators. In Middle East and North Africa namely Afghanistan and United Arab Emirates could not be considered. In Sub Saharan Africa namely Botswana and Guinea could not be considered for the same reason.

In overall BSSI based Ranking of the countries in Table X that faired the first three ranks are Central African Republic, Columbia, Equatorial Guinea respectively. The countries that faired poorly are Greece, Cyprus and Bhutan with 98, 97 and 96 ranks respectively. In group wise classification in Advanced Economies the first rank went to Estonia and the last rank went to Greece. Amongst the Central and Eastern Europe the first rank went to Turkey and the last rank went to Lithuania. In the Commonwealth of Independent States the first rank went to Tajikistan and the last rank went to Kazakhstan. Amongst Developing Asia the first rank went to Solomon Islands and last rank to Tonga. In Middle East and North Africa the first rank went to Saudi Arabia and the last rank to Pakistan. Amongst Sub Saharan Africa the first rank went to Central African Republic and the last rank went to South Africa. In Western Hemisphere the first rank went to Columbia and the last rank to El Salvador.

4.2.3 BSSI and Ranking of Countries for Year 2012

Table XI
BSSI and Ranking of Countries for Year 2012

2012	D1	D2	D3	D4	D5	D6	D	BSSI	Rank within Country Groups	Overall Ranking
World										
Advanced Economies										
Australia	0.19	0.06	0.97	0.06	0.83	0.54	2.67	0.33299	18	93
Austria	0.36	0.20	0.95	0.34	0.66	0.45	1.90	0.43667	5	69
Belgium	0.40	0.09	0.94	0.18	0.64	0.43	2.31	0.379906	11	85
Canada	0.33	0.05	0.99	0.03	0.83	0.53	2.53	0.35079	16	91
Czech Republic	0.32	0.15	0.91	0.19	0.80	0.56	2.07	0.412003	6	77
Denmark	0.43	0.07	0.90	0.17	0.62	0.42	2.38	0.3697	12	87
Estonia	0.44	0.31	0.95	0.11	0.74	0.63	1.79	0.454137	3	61
France	0.28	0.06	0.93	0.24	0.66	0.45	2.40	0.367396	13	88
Israel	0.29	0.14	0.94	0.16	0.72	0.50	2.28	0.383865	10	84
Italy	0.24	0.07	0.76	0.14	0.60	0.40	2.75	0.32313	19	94
Korea	0.27	0.22	0.99	0.15	0.69	0.49	2.23	0.390695	9	82
Latvia	0.35	0.34	0.85	0.33	0.68	0.50	1.67	0.471779	1	55
Luxembourg	0.43	0.12	1.00	0.17	0.71	0.48	2.14	0.403395	7	78
Malta	0.33	0.19	0.87	0.06	0.79	0.57	2.23	0.390916	8	80
Portugal	0.21	0.14	0.82	0.22	0.55	0.38	2.58	0.344037	17	92
San Marino	0.08	0.13	0.65	0.15	0.39	0.17	3.50	0.23587	21	96
Singapore	0.40	0.26	0.98	0.14	0.77	0.57	1.89	0.439436	4	67
Slovak Republic	0.32	0.41	0.91	0.23	0.69	0.52	1.74	0.461773	2	59
Spain	0.18	0.09	0.87	0.31	0.40	0.26	2.90	0.304508	20	95
Switzerland	0.36	0.08	0.99	0.17	0.63	0.43	2.41	0.365769	14	89
United Kingdom	0.36	0.08	0.94	0.13	0.64	0.43	2.46	0.36013	15	90
Emerging and Developing Economies										
Central and Eastern Europe										
Bosnia & Herzegovina	0.36	0.54	0.77	0.29	0.66	0.49	1.55	0.491886	3	47
Bulgaria	0.35	0.32	0.71	0.27	0.67	0.49	1.87	0.442398	7	65
Croatia	0.49	0.54	0.76	0.15	0.67	0.51	1.59	0.484551	5	51
Kosovo	0.39	0.30	0.87	0.42	0.67	0.48	1.59	0.48526	4	50
Lithuania	0.32	0.44	0.74	0.10	0.69	0.53	1.98	0.4254	8	73
Macedonia, FYR	0.37	0.38	0.82	0.54	0.64	0.46	1.45	0.508	2	37
Poland	0.29	0.25	0.91	0.31	0.74	0.54	1.84	0.446263	6	64
Romania	0.29	0.21	0.68	0.41	0.55	0.34	2.20	0.394242	9	79
Turkey	0.39	0.43	0.95	0.35	0.80	0.67	1.27	0.539415	1	24

Commonwealth of Independent States										
Armenia	0.35	0.63	0.94	0.05	0.75	0.69	1.62	0.480356	9	52
Belarus	0.49	0.55	0.90	0.10	0.75	0.66	1.46	0.506669	5	38
Georgia	0.36	0.67	0.94	0.25	0.68	0.56	1.38	0.521124	4	31
Kazakhstan	0.38	0.56	0.66	0.24	0.74	0.62	1.48	0.502601	6	41
Moldova	0.61	0.70	0.75	0.23	0.65	0.50	1.28	0.539017	2	25
Russia	0.25	0.41	0.90	0.33	0.78	0.68	1.52	0.496396	7	44
Tajikistan	0.66	0.87	0.84	0.35	0.61	0.43	1.05	0.580898	1	12
Ukraine	0.40	0.58	0.71	0.29	0.64	0.47	1.55	0.49249	8	46
Uzbekistan	0.61	0.39	0.99	0.25	0.76	0.62	1.29	0.536784	3	26
Developing Asia										
Brunei Darussalam	0.50	0.27	0.91	0.34	0.68	0.49	1.59	0.485817	7	49
Cambodia	0.61	0.65	0.96	0.22	0.72	0.67	1.08	0.575999	4	14
Fiji	0.32	0.26	0.93	0.12	0.85	0.72	1.89	0.438794	10	68
India	0.23	0.16	0.94	0.21	0.74	0.52	2.24	0.389525	13	83
Indonesia	0.37	0.44	0.97	0.21	0.85	0.76	1.42	0.513663	6	34
Malaysia	0.38	0.29	0.97	0.10	0.77	0.59	1.93	0.433159	12	71
Maldives	1.00	0.64	0.64	0.34	0.79	0.81	0.78	0.640193	1	3
Philippines	0.39	0.41	0.96	0.35	0.76	0.61	1.35	0.525299	5	29
Solomon Islands	0.91	0.70	0.94	0.15	0.87	0.97	0.83	0.627064	2	5
Sri Lanka	0.29	0.24	0.94	0.22	0.88	0.68	1.80	0.452906	9	63
Thailand	0.33	0.20	0.96	0.23	0.75	0.59	1.91	0.436043	11	70
Tonga	0.86	1.00	0.75	0.17	0.74	0.74	0.91	0.610716	3	8
Vanuatu	0.42	0.50	0.86	0.24	0.61	0.41	1.68	0.471426	8	56
Vietnam	0.19	0.31	0.94	0.09	0.69	0.50	2.32	0.378743	14	86
Middle East and North Africa										
Afghanistan	0.53	0.19	0.91	0.24	0.55	0.37	2.06	0.413557	5	76
Algeria	0.59	0.21	0.80	0.32	0.83	0.63	1.48	0.502899	3	40
Saudi Arabia	0.40	0.46	0.97	0.76	0.75	0.65	0.89	0.61481	1	7
United Arab Emirates	0.48	0.00	0.88	0.29	0.70	0.58	2.05	0.414788	4	75
West Bank and Gaza	0.47	0.36	0.95	0.26	0.76	0.61	1.44	0.509634	2	35
Sub-Saharan Africa										
Botswana	0.49	0.16	0.95	0.42	0.97	0.85	1.32	0.530469	9	28
Burundi	0.47	0.54	0.86	0.36	0.85	0.81	0.97	0.597467	3	9
Cameroon	0.00	0.15	0.80	0.46	0.85	0.60	2.23	0.39086	22	81
Central African Republic	0.55	0.96	0.83	0.47	0.81	0.91	0.56	0.695613	1	1
Chad	0.40	0.58	0.87	0.28	0.76	0.65	1.24	0.544749	7	21
Congo	0.22	0.19	0.97	0.43	0.88	0.62	1.74	0.461332	19	60
Equatorial Guinea	0.61	0.35	0.90	0.75	0.82	0.68	0.78	0.639711	2	4
Gabon	0.15	0.30	0.96	0.55	0.83	0.66	1.54	0.4932	15	45
Ghana	0.41	0.57	0.77	0.36	0.86	0.95	1.01	0.590028	4	10
Kenya	0.50	0.51	0.92	0.00	0.93	0.93	1.51	0.497561	14	43
Lesotho	0.25	0.40	0.96	0.33	0.99	0.90	1.39	0.519238	11	33
Madagascar	0.33	0.31	0.81	0.29	0.86	0.70	1.58	0.486372	16	48
Mauritius	0.36	0.24	0.94	0.15	0.78	0.57	1.94	0.430649	20	72
Namibia	0.27	0.21	0.98	0.52	0.91	0.76	1.45	0.509033	12	36
Nigeria	0.40	0.36	0.94	0.32	0.79	0.68	1.38	0.520969	10	32
Rwanda	0.59	0.60	0.91	0.10	0.76	0.77	1.25	0.543089	8	23
Seychelles	0.68	0.31	0.84	0.08	1.00	0.83	1.48	0.503402	13	39
South Africa	0.32	0.20	0.93	0.14	0.81	0.58	2.05	0.415077	21	74
Swaziland	0.50	0.45	0.82	0.01	0.85	0.80	1.62	0.479674	17	53
Tanzania	0.37	0.32	0.89	0.15	0.82	0.72	1.70	0.467196	18	58
Uganda	0.53	0.46	0.93	0.17	0.93	1.00	1.21	0.551537	6	20
Zambia	0.51	0.37	0.86	0.34	0.90	0.80	1.14	0.563384	5	15
Western Hemisphere										
Argentina	0.37	0.40	0.97	0.74	0.98	0.89	0.85	0.62427	2	6
Brazil	0.34	0.33	0.94	0.79	0.73	0.57	1.19	0.553941	6	17
Chile	0.24	0.21	0.96	0.51	0.77	0.57	1.68	0.470947	14	57
Colombia	0.40	0.57	0.95	0.87	0.81	0.76	0.66	0.667781	1	2
Costa Rica	0.36	0.32	0.97	0.52	0.71	0.58	1.37	0.521485	11	30
Dominican Republic	0.40	0.29	0.94	0.51	0.75	0.61	1.31	0.532855	10	27
Ecuador	0.41	0.43	0.94	0.54	0.70	0.56	1.18	0.556497	5	16
El Salvador	0.38	0.54	0.95	0.57	0.72	0.59	1.03	0.585664	3	11
Guatemala	0.28	0.14	0.98	0.34	0.81	0.63	1.87	0.442231	16	66
Honduras	0.29	0.36	0.94	0.63	0.82	0.65	1.20	0.552278	7	18
Mexico	0.33	0.35	0.96	1.00	0.78	0.62	1.08	0.576217	4	13
Panama	0.32	0.34	0.97	0.28	0.75	0.60	1.65	0.476379	13	54
Paraguay	0.33	0.19	0.96	0.45	0.87	0.71	1.51	0.498378	12	42
Peru	0.27	0.34	0.94	0.71	0.82	0.66	1.21	0.551628	8	19
Trinidad and Tobago	0.62	0.54	0.91	0.14	0.78	0.70	1.25	0.544103	9	22
Uruguay	0.33	0.32	0.98	0.22	0.73	0.55	1.79	0.453283	15	62

Source: Self Computed

In 2012 the following countries namely in Advanced Economies namely Cyprus, Finland, Germany, Greece, Hongkong SAR, Japan, Netherlands, Norway, Slovenia, Sweden and United States could not be considered for lack of one or the other indicator. Amongst the Central and Eastern Europe namely Hungary could not be considered. In Developing Asia namely Bangladesh, Bhutan, China, Myanmar and Samoa could not be considered for missing information on one of the indicators. In Middle East and North Africa namely United Arab Emirates could not be considered. Amongst Sub Saharan Africa namely Guinea could not be considered for the same reason.

In overall BSSI based Ranking of the countries in Table XI that faired the first three ranks are Central African Republic, Columbia, Maldives respectively. The countries that faired poorly are San Marino, Spain and Italy with 96, 95 and 94 ranks respectively. In group wise classification in Advanced Economies the first rank went to Latvia and the last rank went to Greece. Amongst the Central and Eastern Europe the first rank went to Turkey and the last rank went to Bulgaria. In Commonwealth of Independent States the first rank went to Tajikistan and the last rank went to Ukraine. Amongst Developing Asia the first rank went to Maldives and last rank to Vietnam. In Middle East and North Africa the first rank went to Saudi Arabia and the last rank to Afghanistan. Amongst Sub Saharan Africa the first rank went to Central African Republic and the last rank went to Cameroon. In Western Hemisphere the first rank went to Columbia and the last rank to El Salvador.

4.2.4 BSSI and Ranking of Countries for Year 2013

Table XII
BSSI and Ranking of Countries for Year 2013

2013	D1	D2	D3	D4	D5	D6	D	BSSI	Rank within Country	Overall Ranking
World										
Advanced Economies										
Australia	0.11	0.07	0.98	0.04	0.82	0.63	2.74	0.324096	20	98
Austria	0.30	0.22	0.95	0.24	0.65	0.53	2.02	0.419187	4	67
Belgium	0.33	0.14	0.93	0.11	0.75	0.60	2.22	0.391845	6	78
Canada	0.19	0.07	0.99	0.00	0.79	0.61	2.71	0.327742	19	97
Cyprus	0.19	0.14	0.33	0.05	0.38	0.32	3.60	0.225931	23	101
Czech Republic	0.26	0.18	0.91	0.14	0.75	0.61	2.19	0.395594	5	76
Denmark	0.34	0.17	0.92	0.11	0.65	0.53	2.27	0.385546	10	85
Estonia	0.36	0.38	0.97	0.05	0.76	0.70	1.84	0.446666	2	50
France	0.23	0.11	0.92	0.15	0.70	0.56	2.40	0.367363	15	91
Greece	0.17	0.19	0.45	0.13	0.00	0.63	3.54	0.231674	22	100
Ireland	0.38	0.20	0.55	0.13	0.60	0.50	2.38	0.370007	14	90
Israel	0.21	0.16	0.95	0.13	0.73	0.59	2.32	0.37881	12	87
Italy	0.18	0.09	0.71	0.10	0.57	0.47	2.87	0.308749	21	99
Korea	0.20	0.23	0.99	0.06	0.67	0.55	2.44	0.362803	16	92
Latvia	0.31	0.38	0.89	0.22	0.70	0.59	1.75	0.460396	1	40
Luxembourg	0.39	0.14	1.00	0.05	0.71	0.57	2.29	0.382384	11	86
Malta	0.26	0.22	0.85	0.06	0.77	0.63	2.26	0.386257	8	83
Portugal	0.16	0.16	0.82	0.15	0.57	0.47	2.62	0.339821	18	96
Singapore	0.26	0.23	0.99	0.07	0.75	0.62	2.22	0.391729	7	79
Slovak Republic	0.26	0.42	0.91	0.15	0.72	0.62	1.84	0.44562	3	53
Spain	0.16	0.16	0.84	0.16	0.68	0.56	2.45	0.360604	17	93
Switzerland	0.33	0.12	0.99	0.11	0.67	0.55	2.33	0.37669	13	88
United Kingdom	0.35	0.13	0.95	0.12	0.67	0.54	2.26	0.386037	9	84
Emerging and Developing Economies										
Central and Eastern Europe										
Bosnia & Herzegovina	0.30	0.53	0.74	0.19	0.64	0.52	1.78	0.454888	3	44
Bulgaria	0.27	0.33	0.71	0.19	0.68	0.57	2.00	0.422665	8	66
Croatia	0.39	0.51	0.73	0.12	0.66	0.55	1.79	0.454548	4	45
Kosovo	0.27	0.27	0.85	0.26	0.71	0.59	1.88	0.439576	5	58
Lithuania	0.29	0.45	0.80	0.05	0.71	0.62	1.98	0.426257	6	64
Macedonia, FYR	0.27	0.38	0.81	0.33	0.68	0.57	1.69	0.469897	1	32
Poland	0.24	0.27	0.91	0.20	0.72	0.61	2.00	0.422685	7	65
Romania	0.23	0.21	0.62	0.28	0.65	0.53	2.22	0.391073	9	81
Turkey	0.22	0.36	0.95	0.23	0.76	0.67	1.77	0.456844	2	43

Commonwealth of Independent States										
Armenia	0.27	0.58	0.92	0.04	0.72	0.66	1.84	0.446167	8	51
Belarus	0.23	0.51	0.92	0.09	0.75	0.70	1.82	0.449329	7	47
Georgia	0.28	0.65	0.95	0.16	0.75	0.73	1.47	0.504913	3	18
Kazakhstan	0.30	0.48	0.66	0.19	0.75	0.69	1.70	0.468338	4	34
Moldova	0.47	0.57	0.80	0.17	0.71	0.64	1.41	0.514632	1	14
Russia	0.17	0.39	0.90	0.21	0.74	0.66	1.88	0.439801	6	56
Tajikistan	0.45	0.78	0.77	0.12	0.69	0.62	1.42	0.514318	2	15
Ukraine	0.31	0.57	0.78	0.17	0.66	0.55	1.71	0.465543	4	35
Uzbekistan	0.49	0.38	0.99	0.16	0.76	0.67	1.52	0.497053	2	23
Developing Asia										
Bangladesh	0.09	0.12	0.85	0.11	0.79	0.67	2.58	0.343978	16	95
Brunei Darussalam	0.38	0.39	0.92	0.21	0.73	0.63	1.60	0.484366	6	29
Cambodia	0.49	0.65	0.96	0.13	0.72	0.70	1.30	0.535127	4	10
Fiji	0.21	0.25	0.95	0.13	0.81	0.72	2.06	0.413434	9	69
India	0.13	0.16	0.93	0.12	0.72	0.58	2.49	0.356237	15	94
Indonesia	0.36	0.44	0.97	0.13	0.81	0.75	1.58	0.487446	5	27
Macao	0.21	0.00	1.00	0.39	0.81	0.60	2.19	0.395279	12	77
Malaysia	0.20	0.30	0.97	0.06	0.75	0.64	2.22	0.391584	13	80
Maldives	1.00	0.62	0.70	0.25	0.84	1.00	0.83	0.628544	1	1
Philippines	0.28	0.30	0.96	0.25	0.76	0.66	1.76	0.459124	8	42
Solomon Islands	0.74	0.63	0.88	0.03	0.80	0.82	1.24	0.545543	3	6
Sri Lanka	0.25	0.23	0.90	0.09	0.79	0.66	2.14	0.403007	11	74
Thailand	0.23	0.24	0.96	0.14	0.75	0.65	2.09	0.409296	10	73
Tonga	0.79	1.00	0.82	0.14	0.73	0.74	0.96	0.599225	2	2
Vanuatu	0.48	0.46	0.76	0.05	0.71	0.65	1.74	0.462068	7	39
Vietnam	0.17	0.29	0.95	0.07	0.68	0.57	2.35	0.374609	14	89
Middle East and North Africa										
Afghanistan	0.55	0.40	0.92	0.22	0.69	0.57	1.45	0.507744	2	17
Algeria	0.41	0.19	0.82	0.20	0.77	0.65	1.86	0.443662	4	55
Pakistan	0.21	0.26	0.78	0.24	0.73	0.61	2.03	0.418211	5	68
Saudi Arabia	0.30	0.49	0.98	0.53	0.74	0.67	1.14	0.564249	1	5
West Bank and Gaza	0.37	0.33	0.95	0.16	0.77	0.67	1.72	0.464596	3	36
Sub-Saharan Africa										
Botswana	0.35	0.23	0.94	0.18	0.87	0.80	1.73	0.463013	11	37
Burundi	0.43	0.54	0.83	0.26	0.74	0.69	1.27	0.539191	2	7
Cameroon	0.00	0.23	0.82	0.23	1.00	0.80	2.25	0.387237	23	82
Central African Republic	0.94	1.00	0.51	0.12	0.61	0.43	1.50	0.499981	6	20
Chad	0.43	0.55	0.83	0.19	0.78	0.73	1.34	0.527048	4	12
Congo	0.12	0.29	0.98	0.30	0.83	0.70	1.88	0.439652	18	57
Equatorial Guinea	0.43	0.37	0.65	0.11	0.74	0.64	1.83	0.447891	14	48
Gabon	0.13	0.32	0.95	0.32	0.77	0.66	1.84	0.446058	16	52
Ghana	0.32	0.55	0.79	0.24	0.85	0.98	1.31	0.531912	3	11
Guinea	0.24	0.33	0.89	0.18	0.77	0.68	1.89	0.439277	19	59
Kenya	0.46	0.53	0.91	0.00	0.85	0.87	1.56	0.490189	7	26
Lesotho	0.13	0.39	0.94	0.14	0.93	0.88	1.89	0.439229	20	60
Madagascar	0.22	0.35	0.80	0.17	0.84	0.75	1.85	0.444009	17	54
Mauritius	0.28	0.25	0.93	0.10	0.75	0.62	2.09	0.410055	21	72
Namibia	0.20	0.24	0.98	0.34	0.85	0.75	1.73	0.462873	12	38
Nigeria	0.28	0.34	0.94	0.15	0.77	0.69	1.83	0.447205	15	49
Rwanda	0.46	0.50	0.90	0.07	0.72	0.71	1.58	0.486397	8	28
Seychelles	0.55	0.28	0.84	0.09	0.83	0.72	1.69	0.469635	10	33
South Africa	0.23	0.21	0.94	0.11	0.77	0.63	2.19	0.396251	22	75
Swaziland	0.43	0.41	0.88	0.07	0.79	0.75	1.66	0.47465	9	31
Tanzania	0.31	0.35	0.91	0.13	0.78	0.72	1.79	0.453529	13	46
Uganda	0.45	0.43	0.90	0.19	0.77	0.75	1.41	0.515689	5	16
Zambia	0.57	0.49	0.88	0.26	0.80	0.76	1.11	0.569014	1	4
Western Hemisphere										
Argentina	0.17	0.42	0.97	0.50	0.93	0.89	1.29	0.536373	3	9
Brazil	0.25	0.28	0.95	0.55	0.73	0.63	1.50	0.499173	6	21
Chile	0.16	0.22	0.96	0.35	0.77	0.64	1.91	0.435093	12	61
Colombia	0.27	0.55	0.95	0.54	0.77	0.73	1.06	0.57959	1	3
Costa Rica	0.26	0.30	0.97	0.31	0.70	0.62	1.75	0.459926	11	41
Dominican Republic	0.27	0.27	0.96	0.48	0.76	0.67	1.51	0.498497	7	22
Ecuador	0.30	0.43	0.94	0.36	0.69	0.60	1.48	0.502605	5	19
El Salvador	0.30	0.53	0.96	0.40	0.72	0.65	1.28	0.538046	2	8
Guatemala	0.21	0.16	0.98	0.22	0.79	0.67	2.09	0.410199	16	71
Honduras	0.21	0.35	0.94	0.41	0.78	0.68	1.56	0.490796	9	25
Mexico	0.23	0.33	0.94	0.49	0.77	0.68	1.45	0.509035	4	16
Panama	0.21	0.31	0.97	0.20	0.73	0.63	1.96	0.42834	14	63
Paraguay	0.21	0.17	0.96	0.29	0.83	0.73	1.93	0.432903	13	62
Peru	0.18	0.32	0.94	0.42	0.78	0.67	1.63	0.478788	10	30
Trinidad and Tobago	0.46	0.52	0.93	0.08	0.75	0.68	1.53	0.495289	8	24
Uruguay	0.23	0.28	0.98	0.12	0.75	0.64	2.07	0.412885	15	70

Source: Self Computed

In 2013 the following countries namely in Advanced Economies namely Finland, Germany, Greece, Hong Kong SAR, Japan, Netherlands, Norway, Slovenia, Sweden and United States could not be considered for lack of one or the other indicator. Amongst the Central and Eastern Europe namely Hungary could not be considered. In Developing Asia namely Bhutan, China, Myanmar and Samoa could not be considered for missing information on one of the indicators. In Middle East and North Africa namely United Arab Emirates could not be considered.

In overall BSSI based Ranking of the countries in Table XII that faired the first three ranks are Maldives, Tonga, Columbia respectively. The countries that faired poorly are Cyprus, Greece and Italy with 101, 100 and 99 ranks respectively. In group wise classification in Advanced Economies the first rank went to Latvia and the last rank went to Cyprus. Among the Central and Eastern Europe the first rank went to Macedonia FYR and the last rank went to Bulgaria. Amongst Commonwealth of Independent States the first rank went to Moldova and the last rank went to Armenia. In Developing Asia the first rank went to Maldives and last rank to Bangladesh. Middle East and North Africa the first rank went to Saudi Arabia and the last rank to Pakistan. Amongst Sub Saharan Africa the first rank went to Zambia and the last rank went to Cameroon. In the Western Hemisphere the first rank went to Columbia and the last rank to Guatemala.

4.2.5 BSSI and Ranking of Countries for Year 2014

Table XIII
BSSI and Ranking of Countries for Year 2014

2014	D1	D2	D3	D4	D5	D6	D	BSSI	Rank within Country Groups	Overall Ranking
World										
Advanced Economies										
Australia	0.08	0.07	0.98	0.03	0.68	0.51	2.98	0.2954	17	93
Austria	0.20	0.15	0.94	0.21	0.36	0.38	2.79	0.3183	12	84
Belgium	0.23	0.14	0.93	0.11	0.49	0.45	2.69	0.3303	8	80
Canada	0.14	0.06	0.99	0.00	0.68	0.50	2.98	0.2948	18	94
Cyprus	0.17	0.31	0.22	0.06	0.41	0.40	3.35	0.2530	20	98
Czech Republic	0.22	0.17	0.90	0.14	0.60	0.51	2.44	0.3618	5	72
Denmark	0.25	0.17	0.92	0.11	0.38	0.39	2.80	0.3167	15	88
Estonia	0.75	0.37	0.98	0.04	0.55	0.56	1.78	0.4547	1	26
France	0.20	0.08	0.93	0.16	0.45	0.42	2.85	0.3110	16	90
Greece	0.13	0.21	0.42	0.18	0.27	0.31	3.41	0.2459	22	100
Ireland	0.38	0.43	0.64	0.14	0.46	0.44	2.19	0.3965	4	60
Israel	0.14	0.16	0.96	0.17	0.54	0.47	2.61	0.3404	7	78
Italy	0.14	0.11	0.69	0.13	0.36	0.38	3.19	0.2711	19	96
Korea	0.13	0.21	0.99	0.09	0.47	0.44	2.79	0.3178	14	86
Latvia	0.29	0.30	0.92	0.28	0.53	0.50	1.98	0.4257	2	42
Malta	0.15	0.17	0.84	0.08	0.58	0.50	2.71	0.3277	9	81
Portugal	0.09	0.19	0.79	0.22	0.18	0.27	3.36	0.2521	21	99
San Marino	0.06	0.12	0.25	0.06	0.13	0.23	4.46	0.1381	23	102
Singapore	0.19	0.22	0.99	0.07	0.56	0.50	2.57	0.3457	6	77
Slovak Republic	0.23	0.39	0.91	0.15	0.53	0.51	2.17	0.3986	3	59
Spain	0.12	0.17	0.85	0.19	0.47	0.44	2.74	0.3242	10	82
Switzerland	0.21	0.15	0.99	0.13	0.42	0.41	2.79	0.3182	13	85
United Kingdom	0.23	0.09	0.97	0.15	0.47	0.43	2.75	0.3226	11	83

Emerging and Developing Economies										
Central and Eastern Europe										
Bosnia & Herzegovina	0.20	0.51	0.75	0.24	0.46	0.47	2.09	0.4098	5	53
Bulgaria	0.36	0.37	0.71	0.15	0.49	0.48	2.15	0.4014	6	57
Croatia	0.35	0.49	0.71	0.16	0.45	0.46	2.07	0.4132	4	50
Kosovo	0.24	0.34	0.86	0.34	0.65	0.60	1.75	0.4595	1	25
Lithuania	0.34	0.44	0.86	0.05	0.52	0.51	2.15	0.4011	7	58
Macedonia, FYR	0.18	0.34	0.81	0.41	0.49	0.47	2.04	0.4173	3	47
Poland	0.15	0.25	0.92	0.24	0.55	0.50	2.32	0.3781	8	68
Romania	0.23	0.18	0.76	0.24	0.24	0.27	3.00	0.2933	9	95
Turkey	0.20	0.37	0.95	0.26	0.58	0.56	1.96	0.4291	2	40
Commonwealth of Independent States										
Armenia	0.15	0.47	0.88	0.04	0.48	0.49	2.49	0.3560	6	75
Belarus	0.23	0.46	0.92	0.09	0.59	0.59	2.06	0.4145	4	49
Georgia	0.23	0.65	0.95	0.19	0.61	0.68	1.64	0.4778	1	17
Kazakhstan	0.24	0.47	0.79	0.16	0.68	0.67	1.82	0.4497	3	28
Moldova	0.13	0.45	0.80	0.23	0.47	0.48	2.25	0.3875	5	64
Russia	0.09	0.23	0.88	0.25	0.49	0.49	2.52	0.3522	7	76
Tajikistan	0.21	0.48	0.65	0.20	0.15	0.10	3.19	0.2710	8	97
Ukraine	0.18	0.36	0.67	0.22	0.00	0.00	3.81	0.2031	9	101
Uzbekistan	0.41	0.38	0.99	0.18	0.62	0.58	1.72	0.4641	2	22
Developing Asia										
Bangladesh	0.04	0.10	0.84	0.11	0.62	0.53	2.89	0.3061	17	92
Brunei Darussalam	0.34	0.38	0.93	0.17	0.57	0.55	1.90	0.4377	7	36
Cambodia	0.31	0.51	0.97	0.16	0.59	0.67	1.71	0.4669	4	20
China	0.11	0.17	0.98	1.00	0.62	0.51	1.87	0.4411	6	34
Fiji	0.15	0.24	0.96	0.18	0.70	0.64	2.20	0.3951	10	61
India	0.09	0.16	0.92	0.15	0.52	0.46	2.79	0.3177	15	87
Indonesia	0.27	0.43	0.96	0.16	0.66	0.65	1.81	0.4505	5	27
Macao	0.14	0.00	1.00	0.23	0.75	0.49	2.65	0.3353	14	79
Malaysia	0.17	0.30	0.97	0.05	0.58	0.54	2.47	0.3581	13	74
Maldives	1.00	0.83	0.70	0.24	0.64	0.79	0.87	0.6203	1	1
Philippines	0.19	0.30	0.97	0.26	0.59	0.54	2.07	0.4130	8	51
Solomon Islands	0.63	0.65	0.92	0.04	0.64	0.71	1.40	0.5173	3	7
Sri Lanka	0.21	0.21	0.93	0.15	0.69	0.58	2.24	0.3896	11	63
Thailand	0.20	0.26	0.96	0.15	0.58	0.56	2.28	0.3841	12	65
Tonga	0.86	1.00	0.82	0.05	0.53	0.65	1.31	0.5331	2	6
Vanuatu	0.39	0.41	0.81	0.05	0.51	0.53	2.11	0.4070	9	55
Vietnam	0.07	0.24	0.95	0.11	0.44	0.42	2.88	0.3068	16	91
Middle East and North Africa										
Afghanistan	0.49	0.39	0.87	0.27	0.49	0.48	1.73	0.4635	2	23
Algeria	0.19	0.20	0.84	0.22	0.69	0.58	2.21	0.3937	5	62
Lebanon	0.16	0.00	0.93	0.17	0.56	0.50	2.84	0.3120	6	89
Pakistan	0.22	0.30	0.79	0.29	0.60	0.54	2.03	0.4186	4	44
Saudi Arabia	0.24	0.47	0.98	0.77	0.58	0.59	1.25	0.5438	1	4
West Bank and Gaza	0.28	0.32	0.96	0.21	0.61	0.56	1.97	0.4272	3	41
Sub-Saharan Africa										
Botswana	0.26	0.26	0.94	0.14	0.71	0.66	2.03	0.4183	16	46
Burundi	0.23	0.46	0.81	0.35	0.49	0.51	1.84	0.4456	10	32
Cameroon	0.03	0.22	0.83	0.32	0.67	0.58	2.31	0.3797	20	67
Central African Republic	0.94	0.86	0.52	0.18	0.44	0.48	1.50	0.4997	4	10
Chad	0.12	0.33	0.80	0.24	0.64	0.60	2.15	0.4019	19	56
Congo	0.19	0.28	0.96	0.22	0.69	0.59	2.05	0.4154	17	48
Equatorial Guinea	0.46	0.38	0.66	0.14	0.61	0.58	1.86	0.4433	11	33
Ghana	0.24	0.50	0.80	0.24	0.80	1.00	1.47	0.5048	2	8
Guinea	0.26	0.35	0.90	0.23	0.59	0.56	1.94	0.4308	14	38
Kenya	0.28	0.50	0.91	0.20	0.77	0.83	1.50	0.5000	3	9
Lesotho	0.12	0.35	0.93	0.22	0.90	0.80	1.84	0.4459	9	30
Madagascar	0.13	0.36	0.82	0.21	0.88	0.79	1.88	0.4397	12	35
Mauritius	0.22	0.27	0.91	0.09	0.59	0.53	2.37	0.3719	21	69
Namibia	0.15	0.31	0.97	0.36	0.83	0.73	1.71	0.4668	8	21
Nigeria	0.22	0.32	0.95	0.22	0.66	0.63	1.93	0.4325	13	37
Rwanda	0.42	0.47	0.91	0.18	0.59	0.66	1.58	0.4876	6	14
Seychelles	0.35	0.22	0.86	0.12	0.76	0.63	2.02	0.4199	15	43
South Africa	0.15	0.19	0.94	0.15	0.63	0.53	2.47	0.3588	22	73
Swaziland	0.44	0.42	0.88	0.11	0.75	0.77	1.56	0.4894	5	11
Tanzania	0.22	0.32	0.89	0.10	0.68	0.68	2.10	0.4078	18	54
Uganda	0.37	0.44	0.93	0.15	0.67	0.73	1.62	0.4797	7	16
Zambia	0.50	0.48	0.89	0.28	0.65	0.66	1.29	0.5357	1	5

(Contd....)

Table XIII (Continued)

Western Hemisphere										
Argentina	0.15	0.42	0.97	0.57	1.00	0.97	1.24	0.5445	2	3
Brazil	0.21	0.25	0.95	0.64	0.56	0.52	1.73	0.4626	8	24
Chile	0.11	0.20	0.96	0.44	0.64	0.54	2.07	0.4122	13	52
Colombia	0.22	0.53	0.95	0.62	0.64	0.67	1.21	0.5504	1	2
Costa Rica	0.21	0.29	0.97	0.44	0.50	0.51	1.95	0.4300	11	39
Dominican Republic	0.19	0.26	0.97	0.86	0.60	0.57	1.56	0.4893	3	12
Ecuador	0.28	0.41	0.94	0.47	0.51	0.51	1.65	0.4759	6	18
El Salvador	0.22	0.49	0.96	0.48	0.51	0.52	1.61	0.4815	5	15
Guatemala	0.15	0.16	0.98	0.25	0.65	0.58	2.30	0.3805	14	66
Honduras	0.16	0.34	0.94	0.51	0.73	0.67	1.57	0.4878	4	13
Mexico	0.18	0.34	0.95	0.54	0.59	0.55	1.69	0.4696	7	19
Panama	0.15	0.30	0.96	0.10	0.58	0.54	2.41	0.3660	16	71
Paraguay	0.17	0.16	0.97	0.34	0.74	0.64	2.03	0.4185	12	45
Peru	0.14	0.33	0.93	0.45	0.62	0.57	1.82	0.4495	9	29
Trinidad and Tobago	0.37	0.45	0.93	0.12	0.56	0.57	1.84	0.4456	10	31
Uruguay	0.16	0.26	0.98	0.19	0.51	0.48	2.41	0.3667	15	70

Source: Self Computed

In 2014 the following countries namely in Advanced Economies namely Finland, Germany, Hong Kong SAR, Japan, Netherlands, Norway, Slovenia, Sweden and United States could not be considered for lack of one or the other indicator. Amongst the Central and Eastern Europe namely Hungary could not be considered. In Developing Asia namely Bhutan, Myanmar and Samoa could not be considered for missing information on one of the indicators. In Middle East and North Africa namely United Arab Emirates could not be considered. In Sub Saharan Africa namely Gabon could not be considered.

In overall BSSI based Ranking of the countries in Table XIII that faired the first three ranks are Maldives, Tonga, Columbia respectively. The countries that faired poorly are San Marino, Ukraine, and Greece with 102, 101 and 100 ranks respectively. In group wise classification in Advanced Economies the first rank went to Estonia and the last rank went to Greece. Among the Central and Eastern Europe the first rank went to Kosovo and the last rank went to Romania. Amongst Commonwealth of Independent States the first rank went to Georgia and the last rank went to Ukraine. In Developing Asia the first rank went to Maldives and last rank to Bangladesh. Middle East and North Africa the first rank went to Saudi Arabia and the last rank to Lebanon. Amongst Sub Saharan Africa the first rank went to Zambia and the last rank went to South Africa. In the Western Hemisphere the first rank went to Columbia and the last rank to Uruguay.

4.2.6 BSSI and Ranking of Countries for Year 2015

Table XIV
BSSI and Ranking of Countries for Year 2015

2015	D1	D2	D3	D4	D5	D6	D	BSSI	Rank within Country Groups	Overall Ranking
World										
Advanced Economies										
Australia	0.18	0.09	0.98	0.04	0.73	0.60	2.6614	0.3340	18	95
Austria	0.27	0.16	0.94	0.27	0.60	0.52	2.1683	0.3988	8	78
Belgium	0.34	0.13	0.93	0.15	0.62	0.53	2.2763	0.3841	10	82
Canada	0.19	0.04	0.99	0.00	0.71	0.56	2.8453	0.3114	19	97
Czech Republic	0.30	0.17	0.91	0.18	0.67	0.58	2.1505	0.4013	6	75

Denmark	0.38	0.18	0.93	0.15	0.61	0.52	2.1575	0.4003	7	76
Estonia	0.65	0.34	0.98	0.07	0.73	0.74	1.5653	0.4892	2	36
France	0.29	0.08	0.93	0.21	0.59	0.51	2.3947	0.3682	14	88
Greece	0.27	0.30	0.37	0.31	0.30	0.26	2.9558	0.2981	20	98
Ireland	0.53	0.50	0.74	0.14	0.58	0.56	1.6439	0.4766	3	41
Israel	0.19	0.14	0.97	0.34	0.65	0.56	2.1454	0.4020	5	74
Italy	0.21	0.10	0.69	0.17	0.56	0.50	2.6598	0.3342	17	94
Latvia	0.44	0.30	0.92	0.37	0.64	0.58	1.5092	0.4985	1	32
Malta	0.22	0.16	0.88	0.12	0.66	0.57	2.4084	0.3664	15	89
Portugal	0.17	0.22	0.79	0.31	0.56	0.50	2.2695	0.3850	9	81
San Marino	0.14	0.14	0.19	0.07	0.46	0.42	3.6291	0.2223	21	99
Singapore	0.25	0.24	0.98	0.05	0.65	0.58	2.3309	0.3767	12	86
Slovak Republic	0.31	0.35	0.92	0.22	0.63	0.59	1.8077	0.4511	4	53
Spain	0.21	0.16	0.89	0.16	0.59	0.52	2.4342	0.3631	16	90
Switzerland	0.29	0.16	0.99	0.16	0.56	0.50	2.3820	0.3699	13	87
United Kingdom	0.37	0.13	0.98	0.16	0.57	0.50	2.2840	0.3830	11	83
Emerging and Developing Economies										
Central and Eastern Europe										
Bosnia and Herzegovina	0.22	0.51	0.76	0.33	0.55	0.50	1.8104	0.4507	6	54
Bulgaria	0.46	0.40	0.75	0.19	0.60	0.57	1.7146	0.4654	5	46
Croatia	0.42	0.44	0.72	0.27	0.47	0.38	1.9422	0.4310	8	67
Kosovo	0.35	0.41	0.89	0.45	0.73	0.70	1.2455	0.5444	1	10
Lithuania	0.54	0.35	0.91	0.14	0.61	0.57	1.7136	0.4656	4	45
Macedonia, FYR	0.24	0.34	0.82	0.56	0.62	0.57	1.5735	0.4879	2	37
Poland	0.25	0.26	0.92	0.32	0.61	0.55	1.9235	0.4338	7	66
Romania	0.36	0.20	0.77	0.25	0.63	0.58	1.9813	0.4253	9	68
Turkey	0.24	0.35	0.95	0.35	0.65	0.60	1.7109	0.4660	3	44
Commonwealth of Independent States										
Armenia	0.26	0.54	0.86	0.07	0.51	0.43	2.2099	0.3931	7	80
Belarus	0.34	0.44	0.88	0.14	0.62	0.59	1.8111	0.4506	5	55
Georgia	0.30	0.50	0.95	0.23	0.68	0.70	1.5129	0.4978	2	33
Kazakhstan	0.25	0.32	0.86	0.30	0.65	0.62	1.8055	0.4514	4	52
Moldova	0.21	0.44	0.75	0.25	0.61	0.57	1.8954	0.4380	6	61
Russia	0.14	0.24	0.86	0.27	0.55	0.50	2.3097	0.3796	8	85
Tajikistan	0.26	0.45	0.67	0.28	0.69	0.70	1.6807	0.4707	3	43
Ukraine	0.13	0.19	0.51	0.29	0.00	0.00	4.1464	0.1687	9	100
Uzbekistan	0.50	0.36	0.99	0.26	0.68	0.65	1.4286	0.5120	1	20
Developing Asia										
Bangladesh	0.08	0.06	0.85	0.12	0.67	0.60	2.8071	0.3160	17	96
Bhutan	0.34	0.69	0.89	0.37	0.69	0.76	1.0892	0.5739	3	6
Brunei Darussalam	0.44	0.46	0.99	0.23	0.64	0.61	1.4782	0.5036	7	27
Cambodia	0.39	0.52	0.97	0.19	0.67	0.72	1.4418	0.5098	6	22
China	0.17	0.22	0.97	1.00	0.66	0.57	1.6071	0.4825	8	38
Fiji	0.24	0.22	0.98	0.34	0.74	0.70	1.7852	0.4545	9	49
India	0.14	0.15	0.90	0.17	0.59	0.51	2.5513	0.3479	16	93
Indonesia	0.43	0.48	0.96	0.21	0.68	0.67	1.4359	0.5108	5	21
Malaysia	0.26	0.32	0.97	0.06	0.64	0.58	2.1902	0.3958	14	79
Maldives	0.95	0.84	0.76	0.45	0.72	0.86	0.4929	0.7134	1	1
Philippines	0.23	0.30	0.97	0.32	0.65	0.59	1.8375	0.4466	10	59
Solomon Islands	0.76	0.58	0.93	0.07	0.70	0.77	1.2399	0.5454	4	8
Sri Lanka	0.17	0.19	0.94	0.27	0.73	0.64	2.0862	0.4103	12	72
Thailand	0.29	0.30	0.95	0.22	0.63	0.59	1.9149	0.4351	11	63
Tonga	0.93	1.00	0.87	0.08	0.64	0.73	1.0640	0.5789	2	4
Vanuatu	0.44	0.36	0.79	0.04	0.58	0.53	2.0996	0.4084	13	73
Vietnam	0.15	0.21	0.96	0.17	0.58	0.51	2.4538	0.3605	15	91
Middle East and North Africa										
Afghanistan	0.38	0.26	0.79	0.32	0.55	0.49	1.9030	0.4368	5	62
Algeria	0.34	0.24	0.83	0.27	0.71	0.64	1.7927	0.4534	4	50
Lebanon	0.22	0.00	0.93	0.21	0.65	0.58	2.5295	0.3507	6	92
Pakistan	0.30	0.21	0.80	0.41	0.66	0.61	1.7616	0.4581	3	48
Saudi Arabia	0.32	0.50	0.98	0.90	0.66	0.65	0.9664	0.5987	1	2
West Bank and Gaza	0.33	0.28	0.96	0.31	0.66	0.60	1.7242	0.4639	2	47
Sub-Saharan Africa										
Botswana	0.38	0.22	0.94	0.23	0.68	0.64	1.8221	0.4489	17	57
Burundi	0.32	0.48	0.69	0.37	0.63	0.64	1.4972	0.5005	11	31
Cameroon	0.06	0.21	0.84	0.44	0.71	0.62	2.0754	0.4119	21	70
Central African Republic	1.00	0.87	0.47	0.31	0.50	0.40	1.3810	0.5202	5	17
Chad	0.21	0.38	0.71	0.25	0.66	0.62	1.9193	0.4344	20	65
Congo	0.37	0.48	0.94	0.34	0.70	0.67	1.3083	0.5330	2	12
Equatorial Guinea	0.51	0.47	0.71	0.22	0.65	0.62	1.4760	0.5040	9	26
Ghana	0.31	0.53	0.75	0.32	0.72	0.88	1.3176	0.5314	3	13

(Contd....)

Table XIV (Continued)

Guinea	0.27	0.33	0.89	0.35	0.71	0.68	1.6166	0.4809	13	39
Kenya	0.44	0.53	0.90	0.24	0.75	0.82	1.2158	0.5499	1	7
Lesotho	0.23	0.32	0.93	0.27	0.87	0.86	1.6319	0.4785	14	40
Madagascar	0.18	0.38	0.84	0.27	0.88	0.87	1.6501	0.4756	15	42
Mauritius	0.33	0.32	0.88	0.17	0.64	0.58	1.9185	0.4345	19	64
Namibia	0.20	0.35	0.97	0.39	1.00	0.89	1.4629	0.5062	8	25
Nigeria	0.31	0.42	0.92	0.34	0.70	0.69	1.4481	0.5087	7	23
Rwanda	0.47	0.54	0.90	0.18	0.67	0.73	1.3704	0.5221	4	15
Seychelles	0.56	0.35	0.87	0.14	0.56	0.50	1.7984	0.4525	16	51
South Africa	0.19	0.14	0.95	0.19	0.71	0.61	2.2919	0.3820	22	84
Swaziland	0.47	0.45	0.89	0.07	0.80	0.88	1.5261	0.4957	12	34
Tanzania	0.35	0.35	0.85	0.07	0.72	0.73	1.8780	0.4405	18	60
Uganda	0.42	0.45	0.91	0.15	0.72	0.79	1.4935	0.5011	10	30
Zambia	0.42	0.36	0.87	0.32	0.71	0.68	1.4124	0.5148	6	19
Western Hemisphere										
Argentina	0.16	0.41	0.97	0.80	0.93	1.00	1.0870	0.5744	2	5
Brazil	0.26	0.22	0.94	0.84	0.66	0.60	1.4552	0.5075	8	24
Chile	0.14	0.17	0.97	0.63	0.68	0.59	1.8305	0.4477	13	58
Colombia	0.28	0.51	0.95	0.84	0.69	0.70	0.9681	0.5983	1	3
Costa Rica	0.26	0.28	0.97	0.64	0.60	0.57	1.5475	0.4921	11	35
Dominican Republic	0.25	0.25	0.97	0.90	0.67	0.64	1.3780	0.5208	6	16
Ecuador	0.39	0.45	0.92	0.53	0.60	0.57	1.2400	0.5454	3	9
El Salvador	0.29	0.50	0.96	0.61	0.60	0.57	1.2508	0.5434	4	11
Guatemala	0.19	0.13	0.98	0.38	0.69	0.62	2.0273	0.4187	14	69
Honduras	0.20	0.32	0.95	0.67	0.77	0.72	1.3445	0.5266	5	14
Mexico	0.22	0.32	0.96	0.75	0.66	0.62	1.3970	0.5175	7	18
Panama	0.22	0.31	0.96	0.11	0.65	0.60	2.1670	0.3990	16	77
Paraguay	0.26	0.15	0.96	0.38	0.76	0.69	1.8160	0.4498	12	56
Peru	0.20	0.30	0.93	0.61	0.71	0.66	1.4931	0.5012	10	29
Trinidad and Tobago	0.46	0.51	0.94	0.15	0.63	0.70	1.4862	0.5023	9	28
Uruguay	0.20	0.22	0.97	0.27	0.64	0.57	2.0819	0.4110	15	71

Source: Self Computed

In 2015 the following countries namely in Advanced Economies namely Cyprus, Finland, Germany, Hongkong SAR, Japan, Netherlands, Norway, Slovenia, Sweden and United States could not be considered for lack of one or the other indicator. Amongst the Central and Eastern Europe namely Hungary could not be considered. In Developing Asia namely Macao, Myanmar and Samoa could not be considered for missing information on one of the indicators. In Middle East and North Africa namely United Arab Emirates could not be considered. In Sub Saharan Africa namely Gabon could not be considered.

In overall BSSI based Ranking of the countries in Table XIV that faired the first three ranks are Maldives, Argentina, and Columbia respectively. The countries that faired poorly are San Marino, Greece, and Canada with 99, 98 and 97 ranks respectively. In group wise classification in Advanced Economies the first rank went to Latvia and the last rank went to San Marino. Amongst the Central and Eastern Europe the first rank went to Kosovo and the last rank went to Romania. In the Commonwealth of Independent States the first rank went to Uzbekistan and the last rank went to Ukraine. Amongst Developing Asia the first rank went to Maldives and last rank to Bangladesh. In the Middle East and North Africa the first rank went to Saudi Arabia and the last rank to Lebanon. Among Sub Saharan Africa the first rank went to Kenya and the last rank went to South Africa. In the Western Hemisphere the first rank went to Columbia and the last rank to Panama.

4.2.7 BSSI and Ranking of Countries for Year 2016

Table XV
BSSI and Ranking of Countries for Year 2016

2016	D1	D2	D3	D4	D5	D6	D	BSSI	Rank within Country Groups	Overall Ranking
World										
Advanced Economies										
Australia	0.15	0.10	0.98	0.09	0.73	0.74	2.4935	0.3553	19	94
Austria	0.27	0.14	0.95	0.30	0.70	0.73	1.9126	0.4354	7	72
Belgium	0.29	0.12	0.94	0.20	0.72	0.74	2.0683	0.4129	12	83
Canada	0.18	0.03	0.99	0.04	0.77	0.76	2.6368	0.3371	21	96
Czech Republic	0.26	0.14	0.92	0.23	0.75	0.77	1.9889	0.4243	9	78
Denmark	0.35	0.15	0.94	0.19	0.73	0.74	1.9519	0.4296	8	73
Estonia	0.65	0.33	0.99	0.11	0.73	0.79	1.4802	0.5033	3	37
France	0.26	0.06	0.93	0.24	0.70	0.72	2.1829	0.3968	16	87
Greece	0.24	0.32	0.37	0.35	0.67	0.71	2.0447	0.4162	11	81
Ireland	0.52	0.47	0.76	0.17	0.71	0.76	1.4000	0.5170	2	31
Israel	0.18	0.14	0.97	0.42	0.74	0.75	1.8800	0.4402	6	69
Italy	0.16	0.05	0.70	0.25	0.62	0.67	2.5233	0.3515	20	95
Latvia	0.33	0.28	0.94	0.48	0.76	0.79	1.3456	0.5264	1	24
Luxembourg	0.45	0.15	0.97	0.16	0.73	0.75	1.8694	0.4418	5	67
Malta	0.22	0.15	0.91	0.18	0.75	0.77	2.1234	0.4051	15	86
Portugal	0.12	0.20	0.80	0.35	0.63	0.67	2.1114	0.4068	14	85
San Marino	0.16	0.13	0.25	0.10	0.59	0.64	3.1381	0.2768	22	97
Singapore	0.23	0.24	0.98	0.12	0.73	0.76	2.0771	0.4116	13	84
Slovak Republic	0.27	0.34	0.92	0.29	0.74	0.78	1.5961	0.4842	4	48
Spain	0.18	0.17	0.90	0.19	0.70	0.72	2.1845	0.3966	17	88
Switzerland	0.22	0.13	0.99	0.18	0.68	0.71	2.2087	0.3933	18	89
United Kingdom	0.35	0.13	0.98	0.20	0.69	0.71	2.0004	0.4226	10	80
Emerging and Developing Economies										
Central and Eastern Europe										
Bosnia and Herzegovina	0.21	0.51	0.80	0.39	0.71	0.76	1.4221	0.5132	3	33
Bulgaria	0.39	0.37	0.77	0.24	0.72	0.78	1.5282	0.4953	4	41
Croatia	0.40	0.50	0.76	0.36	0.74	0.80	1.1933	0.5540	1	15
Kosovo	0.00	0.00	0.00	0.00	0.67	0.00	5.1121	0.0770	9	99
Lithuania	0.31	0.21	0.94	0.19	0.74	0.77	1.8842	0.4396	8	70
Macedonia, FYR	0.20	0.32	0.89	0.63	0.74	0.78	1.3808	0.5203	2	27
Poland	0.25	0.26	0.93	0.36	0.72	0.75	1.6717	0.4722	6	53
Romania	0.32	0.23	0.83	0.28	0.72	0.76	1.7447	0.4608	7	60
Turkey	0.21	0.32	0.95	0.40	0.76	0.81	1.5453	0.4925	5	44
Commonwealth of Independent States										
Armenia	0.33	0.61	0.88	0.14	0.70	0.76	1.4983	0.5003	2	39
Belarus	0.29	0.46	0.78	0.14	0.73	0.79	1.6897	0.4693	5	56
Georgia	0.19	0.45	0.94	0.28	0.79	0.88	1.5467	0.4923	4	45
Kazakhstan	0.23	0.34	0.88	0.37	0.76	0.81	1.5305	0.4949	3	42
Moldova	0.60	0.67	0.72	0.34	0.73	0.81	0.9081	0.6110	1	6
Russia	0.14	0.30	0.84	0.35	0.72	0.77	1.8131	0.4503	6	64
Tajikistan	0.00	0.00	0.00	-0.06	0.67	0.00	5.2335	0.0661	9	100
Ukraine	0.13	0.27	0.47	0.38	0.00	0.00	3.9609	0.1875	8	98
Uzbekistan	0.42	0.32	0.00	0.32	0.76	0.81	2.3480	0.3744	7	92
Developing Asia										
Bhutan	0.33	0.57	0.88	0.45	0.69	0.74	1.1195	0.5680	5	12
Brunei Darussalam	0.38	0.46	0.92	0.24	0.72	0.75	1.3968	0.5175	8	30
Cambodia	0.35	0.51	0.96	0.23	0.74	0.84	1.3563	0.5245	7	25
China	0.14	0.18	0.97	0.99	0.71	0.73	1.5675	0.4889	9	46
Fiji	0.23	0.24	0.96	0.24	0.79	0.84	1.8120	0.4505	12	63
India	0.13	0.14	0.84	0.19	0.69	0.72	2.3564	0.3733	16	93
Indonesia	0.40	0.51	0.95	0.29	0.74	0.82	1.2043	0.5520	6	17
Malaysia	0.23	0.34	0.97	0.10	0.73	0.78	1.9636	0.4279	15	75
Maldives	1.00	1.00	0.82	0.47	0.77	0.96	0.3662	0.7530	1	1
Philippines	0.17	0.27	0.97	0.36	0.74	0.78	1.7439	0.4609	11	59
Samoa	0.45	0.62	0.94	0.45	0.73	0.81	0.8553	0.6224	2	4
Solomon Islands	0.67	0.61	0.93	0.13	0.79	0.89	1.0836	0.5750	4	10

(Contd....)

Table XV (Continued)

Sri Lanka	0.17	0.17	0.95	0.36	0.80	0.81	1.8659	0.4423	14	66
Thailand	0.27	0.31	0.95	0.26	0.72	0.78	1.6930	0.4688	10	57
Tonga	0.60	0.87	0.93	0.17	0.75	0.91	0.9425	0.6037	3	7
Vanuatu	0.37	0.37	0.80	0.04	0.76	0.82	1.8507	0.4446	13	65
Middle East and North Africa										
Afghanistan	0.55	0.36	0.81	0.46	0.75	0.79	1.0439	0.5829	2	8
Algeria	0.30	0.28	0.80	0.27	0.77	0.81	1.6759	0.4715	4	55
Lebanon	0.23	0.00	0.92	0.21	0.74	0.77	2.3424	0.3752	6	91
Pakistan	0.22	0.17	0.83	0.45	0.74	0.77	1.7471	0.4604	5	61
Saudi Arabia	0.31	0.53	0.98	1.00	0.73	0.80	0.7975	0.6354	1	2
West Bank and Gaza	0.27	0.28	0.96	0.33	0.75	0.78	1.6090	0.4822	3	50
Sub-Saharan Africa										
Botswana	0.31	0.20	0.92	0.25	0.78	0.83	1.7684	0.4571	17	62
Burundi	0.39	0.48	0.64	0.48	0.73	0.80	1.1558	0.5611	3	14
Cameroon	0.03	0.15	0.82	0.47	0.79	0.80	2.0666	0.4131	21	82
Central African Republic	0.66	0.77	0.56	0.43	0.69	0.75	0.8555	0.6224	1	5
Chad	0.14	0.31	0.64	0.28	0.74	0.78	1.9780	0.4258	19	76
Congo	0.30	0.55	0.92	0.32	0.82	0.92	1.1972	0.5533	4	16
Equatorial Guinea	0.53	0.55	0.57	0.18	0.73	0.80	1.3951	0.5178	7	29
Ghana	0.27	0.45	0.70	0.37	0.76	0.91	1.3872	0.5192	6	28
Guinea	0.27	0.34	0.84	0.31	0.77	0.82	1.5687	0.4887	12	47
Kenya	0.30	0.51	0.80	0.22	0.81	0.92	1.4231	0.5130	9	34
Lesotho	0.27	0.45	0.94	0.27	1.00	0.76	1.4216	0.5132	8	32
Madagascar	0.15	0.32	0.86	0.33	0.86	0.92	1.6757	0.4715	15	54
Mauritius	0.28	0.32	0.87	0.23	0.74	0.78	1.7139	0.4655	16	58
Namibia	0.19	0.34	0.97	-0.06	0.84	0.90	2.2450	0.3883	22	90
Nigeria	0.18	0.36	0.78	0.22	0.72	0.77	1.8771	0.4407	18	68
Rwanda	0.41	0.52	0.88	0.20	0.74	0.84	1.3352	0.5283	5	22
Seychelles	0.51	0.38	0.88	0.16	0.68	0.72	1.5255	0.4958	11	40
South Africa	0.21	0.19	0.95	0.20	0.79	0.80	1.9966	0.4231	20	79
Swaziland	0.39	0.44	0.83	0.08	0.81	0.93	1.6105	0.4819	13	51
Tanzania	0.30	0.42	0.83	0.14	0.79	0.87	1.6634	0.4735	14	52
Uganda	0.32	0.37	0.82	0.30	0.75	0.84	1.4644	0.5060	10	35
Zambia	0.50	0.39	0.83	0.36	0.78	0.84	1.1277	0.5665	2	13
Western Hemisphere										
Argentina	0.24	0.35	0.97	0.76	0.90	1.00	1.0776	0.5762	2	9
Brazil	0.25	0.25	0.93	0.85	0.73	0.76	1.2907	0.5362	6	20
Chile	0.16	0.20	0.97	0.75	0.74	0.77	1.5382	0.4937	12	43
Colombia	0.26	0.61	0.95	0.86	0.77	0.87	0.7997	0.6349	1	3
Costa Rica	0.23	0.25	0.97	0.83	0.70	0.75	1.3382	0.5277	8	23
Dominican Republic	0.25	0.24	0.97	0.94	0.75	0.80	1.2543	0.5428	4	18
Ecuador	0.24	0.33	0.93	0.47	0.69	0.74	1.4686	0.5053	10	36
El Salvador	0.25	0.46	0.96	0.65	0.70	0.75	1.1184	0.5683	3	11
Guatemala	0.16	0.14	0.97	0.35	0.77	0.80	1.9609	0.4283	15	74
Honduras	0.17	0.30	0.95	0.65	0.83	0.81	1.3684	0.5224	9	26
Mexico	0.18	0.31	0.96	0.84	0.75	0.79	1.2712	0.5397	5	19
Panama	0.19	0.31	0.95	0.15	0.73	0.77	1.9793	0.4256	16	77
Paraguay	0.27	0.18	0.95	0.44	0.79	0.82	1.6053	0.4827	13	49
Peru	0.19	0.36	0.93	0.61	0.77	0.81	1.3142	0.5320	7	21
Trinidad and Tobago	0.38	0.43	0.95	0.16	0.75	0.85	1.4927	0.5012	11	38
Uruguay	0.22	0.24	0.96	0.26	0.68	0.72	1.9032	0.4368	14	71

Source: Self Computed

In 2016 the following countries namely in Advanced Economies namely Cyprus, Finland, Germany, Hong Kong SAR, Japan, Netherlands, Norway, Slovenia, Sweden and United States could not be considered for lack of one or the other indicator. Amongst the Central and Eastern Europe namely Hungary could not be considered. In the Developing Asia namely Bangladesh, Macao, Myanmar and Vietnam could not be considered for missing information on one of the indicators. In Middle East and North Africa namely United Arab Emirates could not be considered. In Sub Saharan Africa namely Equatorial Guinea, Gabon could not be considered.

In overall BSSI based Ranking of the countries in Table XV that faired the first three ranks are Maldives, Argentina, and Columbia respectively. The countries that faired poorly are Tajikistan, Kosovo, Ukraine with 100, 99 and 98 ranks respectively. In group wise classification in Advanced Economies the first rank went to Latvia and the last rank went to San Marino. Amongst the Central and Eastern Europe the first rank went to Croatia and the last rank went to Kosovo. In the Commonwealth of Independent States the first rank went to Moldova and the last rank went to Tajikistan. Amongst Developing Asia the first rank went to Maldives and last rank to Malaysia. In the Middle East and North Africa the first rank went to Saudi Arabia and the last rank to Lebanon. Amongst Sub Saharan Africa the first rank went to Central African Republic and the last rank went to Namibia. In the Western Hemisphere the first rank went to Columbia and the last rank to Panama.

4.2.8 BSSI and Ranking of Countries for Year 2017

Table XVI
BSSI and Ranking of Countries for Year 2017

2017	D1	D2	D3	D4	D5	D6	D	BSSI	Rank within Country Groups	Overall Ranking
World										
Advanced Economies										
Australia	0.14	0.12	0.98	0.12	0.57	0.49	2.7400	0.3242	11	68
Austria	0.26	0.14	0.96	0.30	0.45	0.42	2.4104	0.3662	9	64
Canada	0.15	0.02	0.99	0.08	0.65	0.47	2.9243	0.3019	14	71
Cyprus	0.19	0.22	0.42	0.25	0.07	0.11	3.8036	0.2038	16	73
Czech Republic	0.24	0.09	0.93	0.27	0.58	0.47	2.4047	0.3669	8	62
Denmark	0.36	0.11	0.96	0.25	0.52	0.43	2.3279	0.3771	7	61
Estonia	0.56	0.41	0.99	0.12	0.48	0.52	1.8265	0.4483	1	32
Greece	0.21	0.37	0.16	0.27	0.25	0.26	3.3606	0.2516	15	72
Ireland	0.45	0.49	0.79	0.19	0.38	0.43	1.9683	0.4272	2	39
Israel	0.14	0.13	0.98	0.07	0.52	0.45	2.8922	0.3057	12	69
Latvia	0.32	0.33	0.90	0.24	0.44	0.46	2.1172	0.4060	4	50
Luxembourg	0.46	0.18	0.99	0.20	0.41	0.40	2.2881	0.3825	5	58
Portugal	0.16	0.15	0.76	0.27	0.33	0.34	2.9092	0.3037	13	70
Singapore	0.21	0.23	0.97	0.23	0.52	0.50	2.3008	0.3807	6	59
Slovak Republic	0.26	0.31	0.93	0.35	0.45	0.47	2.0346	0.4177	3	45
United Kingdom	0.31	0.10	0.99	0.25	0.41	0.37	2.5905	0.3429	10	67
Emerging and Developing Economies										
Central and Eastern Europe										
Bosnia and Herzegovina	0.17	0.48	0.82	0.42	0.45	0.53	1.8474	0.4451	3	33
Bulgaria	0.35	0.34	0.81	0.27	0.44	0.49	1.9918	0.4238	4	42
Croatia	0.39	0.52	0.79	0.39	0.40	0.47	1.6677	0.4728	1	20
Lithuania	0.27	0.24	0.94	0.19	0.49	0.47	2.3125	0.3792	7	60
Macedonia, FYR	0.17	0.31	0.89	0.61	0.51	0.53	1.7838	0.4547	2	29
Poland	0.24	0.27	0.93	0.40	0.42	0.42	2.1619	0.3997	6	54
Romania	0.29	0.21	0.88	0.32	0.49	0.51	2.1004	0.4083	5	49
Commonwealth of Independent States										
Armenia	0.25	0.56	0.90	0.17	0.42	0.52	2.0051	0.4219	5	43
Belarus	0.25	0.51	0.76	0.19	0.49	0.58	1.9592	0.4286	4	37
Georgia	0.27	0.41	0.95	0.30	0.68	0.81	1.5045	0.4992	2	14
Kazakhstan	0.35	0.40	0.83	0.49	0.29	0.32	2.0462	0.4160	6	47
Moldova	0.61	0.64	0.66	0.37	0.47	0.61	1.2239	0.5484	1	7
Russia	0.07	0.30	0.82	0.39	0.41	0.46	2.4080	0.3665	7	63
Uzbekistan	0.26	0.39	0.98	0.30	0.57	0.60	1.7516	0.4597	3	27
Developing Asia										
Brunei Darussalam	0.24	0.31	0.93	0.37	0.47	0.54	1.9389	0.4315	6	36
Cambodia	0.35	0.47	0.96	0.25	0.43	0.54	1.8096	0.4508	5	31
Fiji	0.16	0.21	0.96	0.27	0.68	0.71	2.0496	0.4155	8	48

(Contd....)

Table XVI (Continued)

Indonesia	0.38	0.54	0.95	0.30	0.55	0.69	1.3802	0.5204	4	12
Malaysia	0.23	0.33	0.97	0.15	0.50	0.53	2.2287	0.3905	11	57
Maldives	1.00	1.00	0.81	0.47	0.54	0.90	0.5401	0.7000	1	1
Philippines	0.14	0.27	0.97	0.37	0.51	0.51	2.1559	0.4006	10	52
Solomon Islands	0.67	0.64	0.92	0.16	0.68	0.94	1.0611	0.5795	2	2
Sri Lanka	0.16	0.19	0.95	0.39	0.71	0.62	1.9787	0.4257	7	41
Thailand	0.24	0.31	0.94	0.29	0.43	0.50	2.1423	0.4025	9	51
Tonga	0.49	0.79	0.93	0.18	0.55	0.82	1.2190	0.5493	3	6
Middle East and North Africa										
Afghanistan	0.58	0.36	0.78	0.31	0.36	0.39	1.8978	0.4376	2	34
Saudi Arabia	0.31	0.55	0.97	0.84	0.50	0.62	1.1098	0.5699	1	3
Sub-Saharan Africa										
Botswana	0.35	0.20	0.90	0.30	0.56	0.61	1.9091	0.4359	11	35
Burundi	0.38	0.38	0.74	0.46	0.69	0.82	1.2467	0.5442	1	8
Cameroon	0.00	0.16	0.80	0.52	0.77	0.65	2.1602	0.4000	15	53
Central African Republic	0.70	0.83	0.58	0.52	0.36	0.44	1.2469	0.5441	2	9
Chad	0.24	0.36	0.53	0.30	0.36	0.39	2.4885	0.3560	18	66
Congo	0.37	0.62	0.76	0.23	0.45	0.57	1.6749	0.4717	5	21
Equatorial Guinea	0.63	0.59	0.50	0.22	0.42	0.51	1.7255	0.4637	9	26
Ghana	0.17	0.16	0.60	0.43	0.60	1.00	2.0424	0.4166	14	46
Guinea	0.20	0.43	0.80	0.38	0.57	0.63	1.7062	0.4667	7	23
Kenya	0.21	0.54	0.82	0.40	0.65	0.83	1.3777	0.5208	4	11
Lesotho	0.23	0.33	0.92	0.30	0.62	0.68	1.7838	0.4547	10	30
Madagascar	0.00	0.28	0.86	0.34	1.00	1.00	1.9630	0.4280	12	38
Mauritius	0.26	0.27	0.87	0.28	0.54	0.55	2.0341	0.4177	13	44
Namibia	0.16	0.24	0.95	0.16	0.61	0.78	2.1740	0.3981	16	55
Rwanda	0.34	0.47	0.87	0.26	0.48	0.62	1.7067	0.4667	8	24
South Africa	0.19	0.21	0.95	0.23	0.63	0.57	2.1999	0.3945	17	56
Swaziland	-0.28	###	1.00	0.00	0.27	0.29	5.2237	0.0669	19	74
Tanzania	0.29	0.39	0.79	0.23	0.65	0.82	1.6768	0.4713	6	22
Zambia	0.48	0.33	0.78	0.37	0.67	0.73	1.3475	0.5261	3	10
Western Hemisphere										
Argentina	0.17	0.35	0.97	0.77	0.91	0.98	1.1801	0.5565	2	5
Brazil	0.24	0.27	0.93	0.90	0.52	0.53	1.5704	0.4884	4	15
Chile	0.12	0.19	0.97	0.71	0.54	0.51	1.9765	0.4261	11	40
Colombia	0.26	0.58	0.92	0.74	0.51	0.65	1.1564	0.5610	1	4
Costa Rica	0.19	0.25	0.96	0.27	0.39	0.44	2.4498	0.3610	12	65
Dominican Republic	0.25	0.24	0.97	0.89	0.52	0.56	1.5915	0.4850	6	17
El Salvador	0.20	0.44	0.97	0.67	0.40	0.45	1.7118	0.4659	9	25
Honduras	0.12	0.32	0.96	0.76	0.62	0.62	1.5781	0.4872	5	16
Mexico	0.17	0.29	0.96	0.85	0.62	0.63	1.5031	0.4995	3	13
Paraguay	0.25	0.17	0.95	0.47	0.63	0.67	1.7804	0.4553	10	28
Peru	0.16	0.38	0.91	0.58	0.58	0.63	1.5920	0.4849	7	18
Trinidad and Tobago	0.32	0.43	0.95	0.21	0.60	0.70	1.6549	0.4748	8	19

Source: Self Computed

In 2017 the following countries namely in Advanced Economies namely Belgium, Finland, Germany, Hong Kong SAR, Japan, Netherlands, Norway, Slovenia, Spain, Sweden and United States could not be considered for lack of one or the other indicator. Amongst the Central and Eastern Europe namely Hungary and Turkey could not be considered. In Developing Asia namely Bangladesh, Bhutan, China, India Macao, Myanmar, Samoa, Vanuatu and Vietnam could not be considered for missing information on one of the indicators. In Middle East and North Africa namely Algeria, United Arab Emirates and West Bank and Gaza could not be considered. In the Sub Saharan Africa namely Gabon, Rwanda and Uganda could not be considered. For the same reason in the Western Hemisphere namely Ecuador, Guatemala, Panama and Uruguay could not be considered.

In overall BSSI based Ranking of the countries in Table XVI that faired the first three ranks are Maldives, Soloman Island, Saudi Arabia respectively. The countries that faired poorly are Cyprus, Greece, and Canada with 73, 72 and 71 ranks respectively. In group wise classification in Advanced Economies the first rank went to Estonia and the last rank went to Greece. Amongst the Central and Eastern Europe the first rank went to Croatia and the last rank went to Lithuania. In the Commonwealth of Independent States the first rank went to Moldova and the last rank went to Russia. Amongst Developing Asia the first rank went to Maldives and last rank to Malaysia. Middle East and North Africa the first rank went to Saudi Arabia and the last rank to Afghanistan. In the Sub Saharan Africa the first rank went to Burundi and the last rank went to Swaziland. In the Western Hemisphere the first rank went to Columbia and the last rank to Costa Rica.

4.2.9 BSSI and Ranking of Countries for Year 2018

Table XVII
BSSI and Ranking of Countries for Year 2018

2018	D1	D2	D3	D4	D5	D6	D	BSSI	Rank within Country Groups	Overall Ranking
World										
Advanced Economies										
Australia	0.13	0.14	0.99	0.11	0.55	0.39	2.8803	0.3071	16	82
Austria	0.23	0.17	0.97	0.31	0.41	0.30	2.6029	0.3414	9	74
Belgium	0.24	0.16	0.96	0.24	0.38	0.27	2.7714	0.3204	12	77
Canada	0.14	0.04	0.99	0.11	0.60	0.36	3.0423	0.2879	22	90
Cyprus	0.20	0.19	0.63	0.26	0.35	0.26	2.9370	0.3004	20	87
Czech Republic	0.23	0.11	0.94	0.28	0.52	0.35	2.5683	0.3457	7	70
Denmark	0.33	0.13	0.97	0.12	0.41	0.27	2.8563	0.3100	15	81
Estonia	0.53	0.42	1.00	0.19	0.46	0.45	1.8017	0.4520	1	24
France	0.24	0.11	0.95	0.27	0.35	0.24	2.8944	0.3054	19	85
Greece	0.16	0.32	0.21	0.27	0.25	0.17	3.5713	0.2285	24	95
Ireland	0.44	0.54	0.90	0.20	0.35	0.32	2.0583	0.4143	2	40
Italy	0.16	0.10	0.85	0.28	0.35	0.25	3.0407	0.2881	21	89
Korea	0.15	0.18	1.00	0.25	0.41	0.30	2.8158	0.3150	14	79
Latvia	0.35	0.43	0.90	0.21	0.40	0.36	2.1448	0.4021	3	49
Luxembourg	0.43	0.18	0.99	0.15	0.37	0.27	2.6573	0.3345	10	75
Malta	0.23	0.20	0.94	0.22	0.38	0.29	2.7423	0.3239	11	76
Norway	0.35	0.09	0.99	0.53	0.44	0.38	2.1753	0.3979	5	53
Portugal	0.14	0.00	0.83	0.28	0.36	0.28	3.2193	0.2675	23	92
San Marino	0.05	0.09	0.00	0.31	0.00	0.00	5.1977	0.0693	25	96
Singapore	0.19	0.23	0.98	0.21	0.45	0.36	2.5787	0.3444	8	71
Slovak Republic	0.24	0.31	0.95	0.37	0.41	0.34	2.2377	0.3893	6	56
Slovenia	0.22	0.32	0.89	0.38	0.43	0.40	2.1523	0.4011	4	51
Spain	0.15	0.16	0.93	0.34	0.38	0.27	2.7860	0.3186	13	78
Switzerland	0.24	0.20	0.99	0.20	0.33	0.24	2.8816	0.3070	17	83
United Kingdom	0.32	0.12	0.98	0.16	0.37	0.26	2.8833	0.3068	18	84
Emerging and Developing Economies										
Central and Eastern Europe										
Bosnia and Herzegovina	0.21	0.45	0.84	0.42	0.40	0.38	2.0400	0.4169	5	38
Bulgaria	0.29	0.33	0.86	0.27	0.44	0.42	2.1512	0.4012	7	50
Croatia	0.37	0.49	0.82	0.38	0.40	0.39	1.8103	0.4507	2	25
Hungary	0.24	0.00	0.96	0.37	0.55	0.48	2.4551	0.3603	10	67
Kosovo	0.19	0.40	0.96	0.48	0.54	0.53	1.7163	0.4652	1	17
Lithuania	0.24	0.26	0.96	0.18	0.51	0.41	2.3791	0.3703	8	64
Macedonia, FYR	0.18	0.33	0.91	0.64	0.50	0.44	1.8266	0.4482	3	27
Poland	0.23	0.27	0.93	0.37	0.37	0.28	2.4349	0.3630	9	65
Romania	0.30	0.25	0.91	0.31	0.48	0.42	2.1373	0.4032	6	47
Turkey	0.20	0.33	0.93	0.37	0.52	0.45	2.0320	0.4180	4	37

(Contd....)

Table XVII (Continued)

Commonwealth of Independent States										
Armenia	0.21	0.54	0.91	0.30	0.37	0.36	2.1216	0.4054	5	44
Belarus	0.21	0.52	0.91	0.22	0.46	0.49	2.0161	0.4203	4	36
Georgia	0.23	0.44	0.95	0.29	0.62	0.65	1.6815	0.4706	3	16
Kazakhstan	0.34	0.38	0.86	0.40	0.65	0.66	1.4396	0.5102	1	7
Moldova	0.47	0.66	0.77	0.36	0.43	0.49	1.4421	0.5097	2	8
Russia	0.05	0.28	0.81	0.39	0.46	0.42	2.4529	0.3606	7	66
Tajikistan	0.00	0.00	0.00	0.00	0.00	0.18	5.6720	0.0277	9	98
Ukraine	0.17	0.32	0.00	0.46	0.48	0.42	3.0344	0.2889	8	88
Uzbekistan	0.15	0.41	0.98	0.25	0.50	0.49	2.1314	0.4040	6	46
Developing Asia										
Brunei Darussalam	0.23	0.40	0.92	0.28	0.48	0.44	2.0619	0.4138	3	41
Cambodia	0.35	0.49	0.97	0.27	0.39	0.42	1.9299	0.4329	2	33
China	0.11	0.24	0.97	1.00	0.44	0.32	2.1619	0.3997	5	52
Fiji	0.19	0.28	0.95	0.19	0.63	0.60	2.1218	0.4053	4	45
India	0.07	0.16	0.82	0.36	0.25	0.18	3.2577	0.2631	12	93
Indonesia	0.37	0.55	0.96	0.31	0.51	0.56	1.5109	0.4982	1	12
Macao	0.13	0.00	1.00	0.34	0.58	0.33	2.8207	0.3143	10	80
Malaysia	0.23	0.35	0.98	0.22	0.45	0.40	2.3042	0.3803	7	59
Philippines	0.13	0.32	0.97	0.34	0.45	0.38	2.3405	0.3754	8	61
Solomon Islands	0.00	0.00	0.00	0.00	0.25	0.00	5.5601	0.0374	13	97
Thailand	0.22	0.33	0.95	0.28	0.40	0.45	2.2472	0.3880	6	57
Vanuatu	0.24	0.30	0.94	0.19	0.50	0.38	2.3473	0.3745	9	63
Vietnam	0.04	0.16	0.97	0.27	0.43	0.32	2.9313	0.3010	11	86
Middle East and North Africa										
Algeria	0.25	0.33	0.76	0.27	0.60	0.55	1.9627	0.4281	2	34
Lebanon	0.22	-0.23	0.81	0.33	0.46	0.37	3.3150	0.2567	6	94
Pakistan	0.17	0.14	0.85	0.45	0.42	0.30	2.5822	0.3440	4	72
Saudi Arabia	0.29	0.55	0.97	0.84	0.47	0.50	1.2564	0.5424	1	4
United Arab Emirates	0.21	-0.23	0.90	0.38	0.42	0.42	3.2122	0.2683	5	91
West Bank and Gaza	0.18	0.29	0.95	0.47	0.49	0.41	2.0580	0.4143	3	39
Sub-Saharan Africa										
Burundi	0.40	0.36	0.76	0.44	0.53	0.52	1.5803	0.4868	8	14
Cameroon	0.01	0.22	0.77	0.49	0.60	0.47	2.3464	0.3746	18	62
Central African Republic	0.53	0.87	0.71	0.53	0.40	0.48	1.1755	0.5574	1	1
Chad	0.19	0.35	0.46	0.30	0.47	0.43	2.4646	0.3591	19	68
Congo	0.43	0.69	0.66	0.24	0.51	0.64	1.4843	0.5026	6	11
Equatorial Guinea	0.56	0.58	0.31	0.19	0.44	0.49	2.0752	0.4119	12	42
Gabon	0.01	0.22	0.77	0.49	0.62	0.47	2.3345	0.3762	17	60
Ghana	0.34	0.58	0.66	0.38	0.60	0.70	1.3572	0.5244	3	6
Kenya	0.24	0.51	0.78	0.43	0.55	0.70	1.4766	0.5039	4	9
Lesotho	0.22	0.36	0.93	0.28	0.63	0.59	1.8403	0.4462	10	28
Madagascar	0.09	0.32	0.87	0.33	0.92	0.85	1.7884	0.4540	9	23
Mauritius	0.26	0.37	0.88	0.28	0.68	0.43	1.9004	0.4372	11	30
Namibia	0.19	0.31	0.94	0.17	0.49	0.61	2.2357	0.3896	15	55
Rwanda	0.45	0.60	0.89	0.37	0.57	0.62	1.2045	0.5519	2	2
Seychelles	0.30	0.29	0.92	0.10	0.52	0.76	2.0910	0.4097	13	43
South Africa	0.17	0.20	0.93	0.24	0.84	0.44	2.2496	0.3877	16	58
Tanzania	0.20	0.38	0.82	0.29	0.45	0.48	2.1410	0.4026	14	48
Uganda	0.33	0.49	0.94	0.29	0.57	0.73	1.4775	0.5038	5	10
Zambia	0.34	0.34	0.80	0.46	0.61	0.57	1.5217	0.4964	7	13
Western Hemisphere										
Argentina	0.16	0.34	0.95	0.65	1.00	1.00	1.2680	0.5403	2	5
Brazil	0.22	0.29	0.95	0.97	0.48	0.42	1.7249	0.4638	6	20
Chile	0.08	0.20	0.97	0.69	0.49	0.38	2.2133	0.3926	14	54
Colombia	0.24	0.63	0.92	0.74	0.50	0.57	1.2277	0.5477	1	3
Costa Rica	0.18	0.27	0.96	0.29	0.35	0.32	2.5901	0.3430	16	73
Dominican Republic	0.19	0.26	0.97	0.92	0.51	0.47	1.7186	0.4648	5	19
Ecuador	0.19	0.38	0.95	0.66	0.45	0.47	1.7478	0.4603	7	21
El Salvador	0.18	0.44	0.97	0.69	0.39	0.35	1.8703	0.4417	10	29
Guatemala	0.16	0.13	0.96	0.33	0.49	0.40	2.5224	0.3516	15	69
Honduras	0.10	0.34	0.96	0.75	0.54	0.46	1.8123	0.4504	9	26
Mexico	0.16	0.32	0.97	0.82	0.58	0.51	1.6147	0.4812	3	15
Panama	0.15	0.41	0.97	0.54	0.46	0.41	1.9178	0.4346	11	31
Paraguay	0.21	0.20	0.96	0.43	0.56	0.53	2.0108	0.4211	13	35
Peru	0.13	0.41	0.94	0.56	0.53	0.51	1.7699	0.4569	8	22
Trinidad and Tobago	0.31	0.39	0.95	0.28	0.58	0.59	1.7182	0.4649	4	18
Uruguay	0.27	0.35	0.96	0.28	0.56	0.51	1.9206	0.4342	12	32

Source: Self Computed

In 2018 the following countries namely in Advanced Economies namely Finland, Germany, Hong Kong SAR, Japan, Netherlands, Spain, Sweden and United States could not be considered for lack of one or the other indicator. Amongst Developing Asia namely Bangladesh, Bhutan, Maldives, Myanmar Samoa, Sri Lanka and Tonga could not be considered for missing information on one of the indicators. In Middle East and North Africa namely Afghanistan and United Arab Emirates could not be considered. In Sub Saharan Africa namely Botswana, Guinea, Nigeria and Swaziland could not be considered.

In overall BSSI based Ranking of the countries in Table XVI that faired the first three ranks are Central African Republic, Columbia, Rwanda respectively. The countries that faired poorly are Tajikistan, San Marino with 98, 97 and 96 ranks respectively. In group wise classification in Advanced Economies the first rank went to Estonia and the last rank went to San Marino. Amongst the Central and Eastern Europe the first rank went to Kosovo and the last rank went to Hungary. In the Commonwealth of Independent States the first rank went to Kazakhstan and the last rank went to Tajikistan. Amongst Developing Asia the first rank went to Indonesia and last rank to Solomon Islands. In the Middle East and North Africa the first rank went to Saudi Arabia and the last rank to Afghanistan. Amongst Sub-Saharan Africa the first rank went to Burundi and the last rank went to Chad. In the Western Hemisphere the first rank went to Columbia and the last rank to Guatemala.

4.3 BSSI Calibration & Overall Rank for Countries from 2010 to 2018 based on IMF Classification

The empirical studies on bank crisis determinant by Demirguc-Kunt and Detragiache (1998, 2002) and Agarwal and Agarwal (2001, 2004c) indicate that economies which have better institution and regulatory frameworks are less likely to suffer from banking crises. Institutional variables of rule of law and quality of bureaucracy which indicate supervision and regulation are important determinants for banking soundness. Barth, Caprio, and Levine (2001) work on cross country database for supervisory and regulatory control indicate that the good practices force accurate information disclosure which ensure better private sector monitoring of banks promoting better performance and stability.

Good Regulatory and supervision practices enables deeper credit markets, less non-performing assets and less possibility of crisis but they support market mechanism over excess powers being given to the regulators. Barth, Caprio and Levine (2001) work was supported by Podpiera (2004) but not supported by Sundarajan, Martson and Basu (2001). The issues of transparency and financial crisis are pertinent which is worked on by Patel, Balic, and Bwakira (2002) in support of which Mitton (2002) argue that transparency is an important factor that helps weather away financial crisis. Also the better information to IMF helps in reducing borrowing costs, Glennerster and Shin (2003), attract foreign portfolio investments Gelos and Wei, 2005.

The comparison for the countries for past 9 years in their ranks for the classification is available in Table XVII. The ranking for the different countries in the region indicates that they do not same within the group of countries. This is a more relevant list as this specifically controls for various macroeconomic indicators on the basis of which the classification is made. It is also important to note that the financial system works on trust and perception which is an essential element for stability as the entire system is based on

credit. Demirguc-Kunt, Detragiache and Tressel (2006) emphasize the importance of transparency in making supervisory processes effective and strengthening market discipline. They also find positive relationship between compliance with information provision and bank soundness, which is robust to controlling broad indexes of institutional quality, macroeconomic variables, sovereign ratings, as well as reverse causality. An important element that is not considered any of these studies is the change in perception or existing perception about the economy that affects foreign flows and overall credit ratings. Economies macroeconomic indicators can positively or adversely affect the financial system where banking system is a part of the system. A simple example is the contagion effect of the global financial crisis which originated from the United States however the system enjoyed the confidence of the world and international investors and did not receive adverse ranking from international agencies as other countries in the similar state would have received. Compliance with international agencies are often found to have a positive impact on sovereign rating and overall credit frameworks as the mechanism of banking or financial system is based on trust.

Table XVIII
Rank for Countries from 2010 to 2018 based on Classification

World	2010	2011	2012	2013	2014	2015	2016	2017	2018
Advanced Economies									
Australia	25	19	17	20	18	17	19	13	16
Austria	1	3	5	4	15	8	7	11	9
Belgium	3	12	11	7	8	9	12	—	12
Canada	17	13	16	19	17	19	21	15	22
Cyprus	15	22	—	23	22	—	—	16	20
Czech Republic	8	7	6	5	5	6	9	9	7
Denmark	4	11	13	10	14	5	8	7	15
Estonia	2	1	1	2	1	1	3	2	1
Finland	—	—	—	—	—	—	—	—	—
France	9	16	14	14	16	15	16	—	19
Germany	—	—	—	—	—	—	—	—	—
Greece	19	23	—	22	21	20	19	12	24
Hong Kong SAR	—	—	—	—	—	—	—	—	—
Ireland	23	17	—	17	4	3	2	3	2
Israel	—	9	10	12	7	7	6	5	—
Italy	22	21	19	21	19	18	20	—	21
Japan	—	—	—	—	—	—	—	—	—
Korea	13	6	8	15	12	—	—	—	14
Latvia	21	5	3	1	2	2	1	1	3
Luxembourg	6	18	7	11	—	—	5	6	10
Malta	20	8	9	9	9	14	13	—	11
Netherlands	—	—	—	—	—	—	—	—	—
Norway	16	—	—	—	—	—	—	—	5
Portugal	14	20	18	18	20	12	14	14	23
San Marino	18	—	21	—	23	21	22	—	25
Singapore	5	4	4	6	6	11	11	8	8
Slovak Republic	11	2	2	3	3	4	4	4	6
Slovenia	24	—	—	—	—	—	—	—	4
Spain	10	15	20	16	11	16	15	—	13
Sweden	—	—	—	—	—	—	—	—	—
Switzerland	7	10	12	13	13	13	17	—	17
United Kingdom	12	14	15	8	10	10	10	11	18
United States	—	—	—	—	—	—	—	—	—
Emerging and Developing Economies									
Central and Eastern Europe									
Bosnia and Herzegovina	8	4	4	4	6	6	3	1	5
Bulgaria	5	6	8	8	7	4	4	4	7
Croatia	7	5	5	3	4	8	1	3	2
Hungary	9	—	—	—	—	—	—	—	10
Kosovo	2	3	3	5	1	1	9	—	1
Lithuania	10	9	7	6	5	3	8	7	8

Macedonia, FYR	3	2	2	1	3	2	2	2	3
Poland	6	7	6	7	8	7	6	6	9
Romania	4	8	9	9	9	9	7	5	6
Turkey	1	1	1	2	2	5	5	—	4
Commonwealth of Independent States									
Armenia	9	6	6	8	6	7	2	6	5
Belarus	8	5	4	7	4	4	5	4	4
Georgia	5	2	3	3	1	2	3	2	3
Kazakhstan	7	9	9	5	3	5	4	5	1
Moldova	6	4	5	1	5	6	1	1	2
Russia	3	7	7	6	7	8	6	7	7
Tajikistan	1	1	1	2	8	3	9	—	9
Ukraine	4	8	8	4	9	9	8	—	8
Uzbekistan	2	3	2	2	2	1	7	3	6
Developing Asia									
Bangladesh	—	13	—	16	17	17	—	—	—
Bhutan	—	16	—	—	—	3	5	—	—
Brunei Darussalam	3	5	7	6	6	7	8	5	3
Cambodia	1	2	2	4	4	6	7	6	2
China	2	10	—	—	7	8	9	—	5
Fiji	8	8	10	9	10	9	12	7	4
India	9	15	13	15	15	16	16	—	12
Indonesia	7	4	6	5	5	5	6	4	1
Macao	4	14	—	13	14	—	—	—	10
Malaysia	12	9	11	12	13	14	15	10	7
Maldives	—	—	4	1	1	1	1	1	—
Myanmar	—	—	—	—	—	—	—	—	—
Philippines	6	3	5	8	8	10	11	8	8
Samoa	—	—	—	—	—	—	2	—	—
Solomon Islands	10	1	1	3	3	4	4	2	13
Sri Lanka	—	7	9	11	11	13	14	11	—
Thailand	11	11	12	10	12	11	10	9	6
Tonga	—	17	3	2	2	2	3	3	—
Vanuatu	5	6	8	7	9	12	13	—	9
Vietnam	13	12	14	14	16	15	—	—	11
Middle East and North Africa									
Afghanistan	—	—	4	2	2	5	2	2	—
Algeria	2	3	3	4	5	3	4	—	2
Lebanon	5	4	—	—	6	6	6	—	6
Pakistan	4	5	—	5	4	4	5	—	4
Saudi Arabia	1	1	1	1	1	1	1	1	1
United Arab Emirates	—	—	—	—	—	—	—	—	5
West Bank and Gaza	3	2	2	3	3	2	3	—	3
Sub-Saharan Africa									
Botswana	—	—	9	11	16	17	17	18	—
Burundi	3	4	3	2	10	12	4	12	8
Cameroon	17	—	21	23	21	21	21	9	18
Central African Republic	5	1	1	10	7	11	1	1	1
Chad	13	3	8	4	19	20	20	17	19
Congo	8	18	19	19	17	2	3	2	6
Equatorial Guinea	2	2	2	20	12	10	9	3	12
Gabon	1	9	15	15	—	—	—	—	17
Ghana	9	8	7	3	2	4	8	11	3
Guinea	—	—	—	18	14	14	12	13	—
Kenya	18	13	13	6	3	1	7	5	4
Lesotho	15	11	11	16	9	13	6	6	10
Madagascar	14	17	18	17	11	15	15	15	9
Mauritius	16	19	20	21	20	19	16	16	11
Namibia	6	12	14	12	8	9	22	14	15
Nigeria	—	15	12	14	13	7	18	—	—
Rwanda	10	5	6	7	5	3	5	7	2
Seychelles	20	16	14	9	15	16	11	—	13
South Africa	19	20	21	22	22	22	19	19	16
Swaziland	11	6	16	8	4	8	13	8	—
Tanzania	12	14	16	13	18	18	14	10	14
Uganda	7	7	5	5	6	6	10	—	5
Zambia	4	10	5	1	1	5	2	4	7
Western Hemisphere									
Argentina	3	2	2	3	2	2	2	1	2
Brazil	4	5	8	8	8	9	6	7	6

(Contd....)

Table XVIII (Continued)

Chile	12	14	14	12	13	13	12	11	14
Colombia	1	1	1	1	1	1	1	2	1
Costa Rica	10	10	11	11	11	11	8	12	16
Dominican Republic	6	9	10	7	4	7	4	4	5
Ecuador	5	4	6	5	6	3	11	—	7
El Salvador	7	3	3	2	5	4	3	8	10
Guatemala	13	16	16	16	14	14	16	—	15
Honduras	9	7	7	9	3	5	9	9	9
Mexico	2	6	4	4	7	8	5	3	3
Panama	15	12	13	14	15	16	15	—	11
Paraguay	11	13	12	13	12	12	13	10	13
Peru	8	8	9	10	10	10	7	5	8
Trinidad and Tobago	14	11	5	6	9	6	10	6	4
Uruguay	16	15	15	15	16	15	14	—	12

Note: — Not Available

Source: Self Computed

V. Conclusion

The financial soundness indicators which benchmark the financial systems are clearly identified by the IMF which includes encourage set that enables the assessment of the financial system of which deposit taking institution like the Banks are identified by the GFSR financial soundness indicators. Banks are an important part of the overall financial system. It is long debated that the banking systems are dependent on the regulation and supervision of the central banks which are advised to follow the Basel norms. The norms help in banking supervision and control to ensure a healthy banking system. However neither the IMF nor the Basel III norms provide for a consolidated index which can make comparable estimates between countries of their banking system. It was also found that Moody's Rating mechanism was able to rate Banks based on several parameters and were able to offer individual bank ratings in different countries.

The overall situation of banks after global financial crisis and Covid-19 poses a serious concern about a consolidated index which can estimate the health of the banking system. It was hence felt that one identifies the indicators which are important to indicate the financial health of the banking systems of the different countries. The UNDP approach of developing index was found to be relevant to develop a Banking system stability index based on the 6 financial indicators listed in the GFSR. The analysis of the financial soundness indicators help break the myth that there exist differences in the banking systems on the basis of these indicators in the different classification of advanced and emerging and developing countries.

The study estimated the mean values of the 6 different indicators for 9 years and also for different classifications. It was found that no significant differences existed for the years 2010 to 2018. The change in the overall position of the indicators highlighted what the different group offered to investors of the different banking systems. The classification are relevant to find significant differences in the means of the financial indicators which compelled us to the develop a country wise ranking as it indicated the banking system.

The results were more or less surprising as the advanced economies received very low ranking as against many other countries and regions like Columbia in the Western Hemisphere received the first ranking based on the consolidated position of the overall BSSI. It necessitated to understand

when the banking indicator differences really distinguish between the classifications then what would define the vulnerability of the banking system to the international flows and confidence based on the 6 financial soundness indicators (FSIs). We reflected back on the Moody rating where the Macroeconomic profile was relevant in determining the perception of the international community in a banking system which was dependent on several macroeconomic indicators like GDP, inflation, fiscal deficit, exchange rate, current account deficit, foreign exchange reserves, debt to the GDP and others like broad money are all relevant to assess the financial stability and confidence and perception of the international and community.

The BSSI can further be better developed by assessing these indicators through a targeted level which can then be defined as the target level. However literature does not have a unanimous choice on which indicators are guiding lights for the economic health. The debates do not offer a particular guided level of the structures for the overall development of the economy. The classification on development was hence used as a perception barometer which offered a certain confidence in the region which is not quantified but can be further quantified by assessing the macroeconomic indicators. After providing for ranks of the countries within the classification and for 9 years, we do find that classification is relevant for the banking system stability within a specified region and group of classification over the entire set as the banking system is part of the financial system and classification played an important role in determining the overall valuation of the banking system stability.

The BSSI index helps evaluate the banking system of the countries in comparison to the all other countries and within the specific regions helping governments, financial institutions, global investors and retail investor take more informed decisions with respect to their investment in the banking systems, financial governance, economic development, financial stability and countries global ranking in the financial world.

References

Acharya, V. V., D. Anginer and A. J. Warburton, (2017), *"The End of Market Discipline? Investor Expectations of Implicit Government Guarantees,"* New York University, Stern School of Business, USA

Acharya, V. V., I. Gujral, N. Kulkarni, and H. S. Shin, (2011), *"Dividends and Bank Capital in the Financial Crisis of 2007-2009"* NBER Working Paper 16896, National Bureau of Economic Research, Cambridge, MA

Acharya, V. V., R. Engle, and D. Pierret, (2014), *"Testing Macroprudential Stress Tests: The Risk of Regulatory Risk Weights."* *Journal of Monetary Economics* Vol. 65, pp. 36-53

Acharya, V. V., R. Engle, and M. Richardson, (2012), *"Capital Shortfall: A New Approach to Ranking and Regulating Systemic Risks."* *American Economic Review* Vol. 102, No. 3, pp. 59-64.

Acharya, V.V. and T. Yorulmazer, (2007), *"Too Many to Fail: An Analysis of Time Inconsistency in Bank Closure Policies,"* *Journal of Financial Intermediation*, Vol. 16 pp.1-31

ADB, (2015), “Financial Soundness Indicators for financial sector stability: A Tale of Three Asian Countries”, Asian Development Bank, Manilla, Philippines.

Admati, A. R. (2016), “The Missed Opportunity and Challenge of Capital Regulation.” *National Institute Economic Review* Vol. 235, No. 1 pp. R4–R14.

Admati, A. R., and M. Hellwig, (2013), “The Bankers’ New Clothes: What’s Wrong with Banking and What to Do about It”, Princeton University Press, Princeton, New Jersey

Agarwal, Aman, (1999, 2001, 2003), “Unified New Europe and the effect on the Global Village, [Model for “New Europe]”, *Finance India*, Vol. XVII No 3, September 2003. Presented at EU Institute, Columbia University, New York, USA (17th April 2001), Invited to deliver the Keynote Address at University’s 15th year anniversary celebration conference - “European Union”, University Portucalense, Porto, PORTUGAL (8 November 2001), Panel Speaker at conference on “EU Enlargement & Deepening of Europe” at Indian Institute of Finance, INDIA (23rd July 2003)

Agarwal, Aman, (2007c), “Global Dis-Equilibrium, Growth and Europe”, Plenary Keynote Address at the Economia Reale Conference at Sala delle Colonne (Italian Parliament), 19th September 2007. Audio of the Speech online at Italian Media Channels (Radio Radicale Italy www.radioradicale.it/scheda/235385 and Sherpa TV Italy) & at IIF (www.iif.edu)

Agarwal, Aman, (2017d), “Charges on Cash Transactions : An Unfair Trade practice and Not Justified urged Prof. Aman Agarwal” IIF Press Release and The Week March 2nd, 2017; Interviews on Lok Sabha TV; Rajya Sabha TV ; Delhi Doordarshan TV and All India Radio in 2017 and 2018

Agarwal, Aman, (2018a), “World Financial Markets & Crypto Currencies”, Delhi Doordarshan TV (DD India TV), February 18th, 2018 at 6:00 PM and Delhi Doordarshan TV (DD News TV), February 19th, 2018 at 10:00 am (<https://youtu.be/aDiLdT2-Kug>)

Agarwal, Aman, (2018b), “Mobile Mandi & Mandi on Wheels for Efficient Agriculture Markets facilitating Doubling Farmers’ (Kisan) Income”, IIF Press Release, February 3rd, 2018 <http://www.iif.edu/media/pr/2018/20180203pr001.htm>

Agarwal, Aman; Jack HW Penm and Saurabh Agarwal, (2006), “Common Currency for India and the ASEAN Region : An Empirical Investigation”, Working Paper, Indian Institute of Finance, December 2016

Agarwal, Aman; JHW Penm; Wing-Keung Wong and Lynn M Martin, (2004), “ASEAN DOLLAR : A Common currency establishment for stronger economic growth of ASEAN Region” *Finance India*, Vol XVIII, Special Issue 2004.

Agarwal, J.D. and Aman Agarwal (2008), “Money Laundering : The Real Estate Bubble”, *Finance India*, Vol 22 No 1, March 2008. Invited to deliver the address to the AFFI (French Finance Association) Annual Meeting June 2007 on Finance, Ethics and Governance organized by the University of Bordeaux IV, Bordeaux and AFFI, (France) at the Annual Meeting International Conference in Bordeaux, FRANCE (June 27-29th, 2007)

Agarwal, J.D. and Agarwal, Aman (2001), “Liberalization of Capital Flows, Banking System & Trade: Focus on Crisis Situations”, *International Review of Comparative Public Policy* titled “International Financial Systems and Stock Volatility” Vol. 13, pp. 151-212. Invited to present at 18th International Conference of Finance at Namur, BELGIUM (25th-28th June 2001), at Florida International University, Florida, USA (26th September 2001), discussed with FIU Finance faculty at Luncheon presentation, Florida, USA (27th September 2001), at Pontific Catholic University of Rio de Janeiro, Rio de Janeiro, BRAZIL (22rd October 2001). Also Discussed at few conferences in USA and UK in April and May 2001

Agarwal, J.D. and Aman Agarwal (2004a), "India AML Progress Analyzed" *USA Patriot Act Monitor*, August 2004

Agarwal, J.D. and Aman Agarwal, (2004b), "Financial Planning for Retirement: Key Principles and Concepts", *University Today*, Vol XXIV No 16, 15th August 2004 issue. Invited to present as Keynote Address at two-day National Conference on "Recent Pension Reforms Initiatives in India" by EPFO, Government of India (1-2 July 2004), delivered on 1st July 2004.

Agarwal, J.D. and Aman Agarwal, (2004c), "International Money Laundering in the Banking Sector", *Finance India*, Vol XVIII No 2, June 2004; Reprinted with permission in *The ICFAI Journal of Banking Law*, Vol. II No. 4, October 2004, the journal of ICFAI University, Hyderabad. Invited to deliver as the Keynote Address at the Asia Pacific Bankers Congress 2004 in Manila, PHILIPPINES on 26th March 2003. (25-26th March 2004). Covered widely by over 300 International Press (TV & Newspapers including leading newspapers in India).

Agarwal, J.D. and Aman Agarwal, (2005), "Inflation, Savings and Financial Development", *Finance India*, Vol XIX No 2, June 2005

Agarwal, J.D. and Aman Agarwal, (2006), "Money Laundering : New Forms of Crime Victimization (Current Trends and Modus Operandi)", *Finance India*, Vol. 19 No 4, December 2006. Keynote address delivered at the National Workshop on New Forms of Crime Victimization with reference to Money Laundering, organized by the Indian Society of Victimology, Department of Criminology, University of Madras, Chepauk, Chennai, INDIA, on 18th November 2006 to senior officials from the government, judiciary, intelligence and enforcement agencies in India and outside.

Agarwal, J.D. and Aman Agarwal, (2007), "Climate Change, Energy and Sustainable Development", *Finance India*, Vol XXI No 4, December 2007. Invited to delivered as the Opening Keynote Address at the Global Forum 2007 in Goteburg, SWEDEN (November 5th, 2007) and discuss at Swedish Parliament in Stockholm (November 10-11th, 2007).

Agarwal, J.D. and Aman Agarwal, (2008), "Money Laundering : The Real Estate Bubble", *Finance India*, Vol XXII No 1, March 2008.

Agarwal, J.D. and Aman Agarwal, (2017, 2018), "Niti Aayog's India : Three Year Action Agenda 2017-18 to 2019-20 : Review and Analysis", *Finance India*, Vol 31, No 3, September 2017, pp. 905-928 and AESTIMATIO, *The EIB International Journal of Finance*, Vol 16, pp 2-23 DOI :10.560/IEB.18.7, February 2018

Agarwal, J.D. and Yamini Agarwal, (2017), "Analysis of Union Budget 2017", *Finance India*, Vol. XXXI No. 1, March 2017

Agarwal, J.D., (1969, 1988a), "*Capital Budgeting Decision under Risk and Uncertainty*", IIF Publications, Delhi, India, 1988; Doctoral Thesis Work done at Delhi School of Economics, The University of Delhi, Delhi, 1969

Agarwal, J.D., (1980), "Ordinal Ranking of Objective : A Conceptual Framework", *The Management and Labour Studies*, The Journal of Xavier Institute, Jamshedpur, Vol 6, No 2, December 1980, pp. 85-96

Agarwal, J.D., (1991), "Black Money : Some Dimensions", *Finance India*, Vol. V, No. 1, March 1991. pp. 55-60

Agarwal, J.D., (2004), "Volatility of International Financial Markets, Regulation and Financial Supervision", *Finance India*, Vol XVIII No 1, March 2004; delivered as invited Opening Keynote address at IVth International Finance Conference hosted by University of Santiago de Chile, Chile (January 7th, 2004). Covered widely in International press including North America

Agarwal, J.D., (2007a), "Innovations & Developments in Financing and Investment in Agriculture and Rural Development (with special reference to India and Hungary)", *Finance India*, Vol XXI No 4, December 2007, Invited to deliver as the Opening Plenary Keynote Address at the Szent Istvan University, Faculty of Economics 50 years Celebration Conference [December 3-6th, 2007]

Agarwal, J.D., (2007b), "Modelling and Analysis of Safety and Risk in Complex Systems", *Finance India*, Vol XXI No 3, September 2007; delivered as invited as Opening Keynote Address at 7th International Scientific School Conference of Russian Academy of Sciences at RAS Saint Petersburg, Russia. 4-8th September 2007

Agarwal, J.D., (2008), "Global Financial Slowdown, Indian Capital Markets & Indian Economy", *All India Radio*, October 12th, 2008

Agarwal, J.D., (2017), "Innovation, Disruption and Transformation in Financial Markets", delivered as invited Keynote Address at ICFAI Business School (IBS) Mumbai on 7th April 2017

Agarwal, J.D., (2018c), "Analysis of Union Budget 2018", *Finance India*, Vol. XXXII No. 1, March 2018

Agarwal, J.D., Evgeny Solojentsev and Aman Agarwal (2008), "Logic and Probabilistic Risk Models of Bribes" *Finance India*, Vol XXII No 3, September 2008

Agarwal, J.D., Manju Agarwal and Aman Agarwal, (2016, 2017), "Financial Inclusion, Banking and Digital Dividends", delivered as invited Guest of Honour Keynote Address at Digital Wallet Summit 2017 in Bangalore, India on June 16th, 2017 and Guest of Honour Valedictory Address at "Digital Dividends" at International Conference on Technoviti - Futurecrafting Business with Technoruptions at ITC Grand Maratha, Mumbai, INDIA (February 5th, 2016)

Agarwal, J.D.; Manju Agarwal ; Aman Agarwal ; Yamini Agarwal, (2018), "The Theory of Money, Wealth and Efficient Currency Market : Modeling M5 as Money Supply with Crypto-Currency", *Finance India*, Vol 32, No 2, June 2018

Agarwal, J.D; Manju Agarwal; Aman Agarwal and Yamini Agarwal, (2017b), "Theory of Employment, Wealth and Efficient Labour Market through National Labour Exchange (NLX)", *Finance India*, Vol 31, No 3, September 2017, pp. 777-808; Invited to be delivered as (a) Guest of Honour Plenary Keynote Address at Saint-Petersburg State University of Aerospace Instrumentation (SUAI) International Week Opening Ceremony Session from May 22-26th, 2017 at St. Petersburg, Russia; (b) as Plenary Keynote Address at Bilateral International Conference FIM & ISME 2017 [26 Int. Conf. Forum of Interdisciplinary Mathematics & Int. Symposium on Mgt Engg. 2017] from August 25-28, 2017 at KICC Kokura, Kitakyushu City, Fukuoka, Japan ; (c) as Guest of Honour Address at Universiti Teknologi PETRONAS, Malaysia in Nov 2017 at Perak Darul Ridzuan, MALAYSIA; (d) as Guest of Honour Plenary Keynote Address at the 10th International Finance Conference 2018 in Tunisia in April 2018 along with other Plenary Speakers - Prof. Harry M. Markowitz (Nobel Prize Laureate 1990); Prof. Giovanni Barone-Adesi (UoL, Switzerland); Prof. Oldrich Alfons Vasicek (VA USA); Prof. Nizar Touzi, (EP, France); Farid Aitsahlia (UFL, USA)

Agarwal, J.D; Manju Agarwal; Aman Agarwal and Yamini Agarwal, (2017a), "Theory of Land and Efficient Land Markets through Real Estate Exchange", *Finance India*, Vol 31, No 2, June 2017, pp. 413-442

Agarwal, Manju and Saurabh Agarwal, (2007) "Economics of Public Utilities in market Driven Economic Systems", *Finance India*, Vol. XXI, No 3, September 2007

Agarwal, Manju, (1988), "Tax Incentives and Investment Behaviour", IIF Publication, Delhi, 1988.

Agarwal, Manju; Aman Agarwal and Yamini Agarwal, (2018), "*India 2018 : Jobs and Growth through Financial Inclusion, Banking and Digital Dividends (Demonetization Demystified)*", Invited to be delivered as Plenary Keynote Address at Delhi Technical Campus, GGS Indraprastha University, Greater Noida, Uttar Pradesh, INDIA (February 9th, 2018). Earlier invited to be delivered as Guest of Honour / Plenary Keynote Address / Industry Keynote Address at 10th CFO Summit 2017 in Delhi, India (Dec 7th, 2017); at Noida International University (NIU) Global Summit, Greater Noida, INDIA (October 11th, 2017); at Bureau of Indian Standards, Delhi, INDIA (August 30th, 2017); at Banking and Finance Academy, at Tashkent UZBEKISTAN (May 27th, 2017); Tashkent Finance Institute, Tashkent, UZBEKISTAN; Tashkent State University of Information Technology, at Tashkent UZBEKISTAN (May 27th, 2017); at Saint-Petersburg State University of Aerospace Instrumentation , SUAI International Week, St. Petersburg, RUSSIA (May 23rd, 2017) ; at Daulat Ram College, University of Delhi Annual Conference in Delhi, INDIA (February 15th, 2017); Finnoviti Banking Award Summit 2017, Mumbai, India (January 19th, 2017); and other International Conferences in USA, UK, Japan, Sweden, Finland, China, Russia, France, Canada, Taiwan and others in the last 10 years. All Interviewed on All India Radio (AIR); Lok Sabha TV, Rajya Sabha TV, Delhi Doordarshan (DD), BBC, NDTV, Bloomberg TV and in many Newspapers/Magazines multiple times since 2007 times since beginning of 2016.. Extracts discussed and delivered at IMF-World Bank 2017 Annual Spring Meeting (April 2017); ADB Annual Meetings (May 2017) and OECD Forum Annual Meeting (June 2017). News Covered by large number of International Press in USA, India, Japan, China and Europe.

Agarwal, Yamini, (2010), "Capital Structure Decisions under Multiple Objectives: A study of Indian Corporates", *Finance India*, Vol. 24 No. 2, June 2010, pp. 515-523

Agarwal, Yamini, (2013a), "*Capital Structure Decisions: Evaluating Risk and Uncertainty*" John Wiley & Sons, USA (Wiley USA, UK & Singapore)

Agarwal, Yamini, (2013b), "*Capital Structure Decisions under Multiple Objectives : A Study of Indian Corporates*", IIF Publication, Delhi, 2013

Agarwal, Yamini, K.C. Iyer and Surendra S. Yadav, (2009), "Capital Structure Decision: A Behavioral Study on Multiple objectives framework", *Finance India*, Vol. 23, No. 2, June, 2009, pp 431-468

Agarwal, Yamini, K.C. Iyer and Surendra S. Yadav, (2012) "Multi-objective Capital Structure Modeling: An Empirical Investigation of Goal Programming Model Using Accounting Proxies", *Journal of Accounting, Auditing and Finance*, Vol. 27, No.3, July 2012, pp. 359-385

Agoraki, M. E., K. Manthos, D. Delis, and F. Pasiouras, (2011), "Regulations, Competition and Bank Risk-Taking in Transition Countries." *Journal of Financial Stability* Vol. 7, No. 1, pp. 38-48

Ait-Sahalia, Y., J. Andritzky, A. Jobst, S. Nowak, and N. Tamirisa, (2012), "Market Response to Policy Initiatives during the Global Financial Crisis," *Journal of International Economics* Vol. 87 No. 1 pp. 162-177

Aiyar, S., C. W. Calomiris, and T. Wielade, 2014b, "Identifying Channels of Credit Substitution When Bank Capital Requirements Are Varied." *Economic Policy* Vol. 29, No. 77 pp. 45-77

Aiyar, S., C. W. Calomiris, and T. Wieladek, 2014a, "Does Macro-Prudential Regulation Leak? Evidence from a UK Policy Experiment." *Journal of Money, Credit and Banking*, Vol. 46 pp. 181-214

Aiyar, S., C. W. Calomiris, and T. Wieladek, 2015, "Bank Capital Regulation: Theory, Empirics, and Policy." *IMF Economic Review* Vol. 63, No. 4 pp. 955-983

- Allen, F. and D. Gale, 2000, *"Comparing Financial Systems"*, The MIT Press, Cambridge, MA
- Allen, F., A. Babus, and E. Carletti, (2009), "Financial Crises: Theory and Evidence." *Annual Review of Financial Economics*, Vol. 1, No. 1 pp. 97-116
- Allen, F., and A. M. Santomero, (1998), "The Theory of Financial Intermediation." *Journal of Banking and Finance* Vol. 21 pp. 1461-1485
- Allen, F., and D. Gale, (2004), "Financial Intermediaries and Markets." *Econometrica* Vol. 72, pp. 1023-1061
- Allum, Peter F., and Mehmet Agça, (2001), "Economic data dissemination: What influences country performance on frequency and timeliness?" IMF Working paper 01/173
- Anginer, D., A. C. Bertay, R. Cull, A. Demirgüç-Kunt, and D. S. Mare, (2019), "Bank Regulation and Supervision Ten Years after the Global Financial Crisis," Policy Research Working Paper WPS9044, World Bank, Washington, DC
- Anginer, D., A. Demirgüç-Kunt, and D. S. Mare, (2018), "Bank Capital, Institutional Environment and Systemic Stability." *Journal of Financial Stability* Vol. 37, pp. 97-106
- Anginer, D., A. Demirgüç-Kunt, and M. Zhu, (2014), "How Does Competition Affect Bank Systemic Risk?" *Journal of Financial Intermediation* Vol. 23 No. 1 pp. 1-26
- Anginer, D., A. Demirgüç-Kunt, H. Huizinga, and K. Ma, (2016), "Corporate Governance and Bank Capitalization Strategies." *Journal of Financial Intermediation*, Vol. 26 pp. 1-27
- Anginer, D., A. Demirgüç-Kunt, H. Huizinga, and K. Ma, (2018), "Corporate Governance of Banks and Financial Stability." *Journal of Financial Economics*, Vol. 130, No. 2 pp. 327-346
- Babihuga, R., (2007), "Macroeconomic and Financial Soundness Indicators: An Empirical Investigation", IMF Working Paper 07/115, International Monetary Fund, Washington
- Baldassarri, Mario, and Pasquale Capretta, (2007), *"The World Economy towards Global Disequilibrium : American-Asian Indifference and European Fears"*, Palgrave Macmillan, London, UK
- Baldassarri, Mario, John McCallum and Robert Mundell, (1992), *"Global Disequilibrium in the World Economy"*, Palgrave Macmillan, London, UK
- Barth, J. R., G. J. Caprio, and R. Levine, (2008), *"Rethinking Bank Regulation: Till Angels Govern"*, Cambridge University Press, Cambridge
- Barth, J. R., G. J. Caprio, and R. Levine, (2001), *"The Regulation and Supervision of Banks around the World: A New Database"*, Policy Research Working Paper WPS2588, World Bank, Washington, DC.
- Barth, J. R., G. J. Caprio, and R. Levine, (2012), *"Guardians of Finance: Making Regulators Work for Us"*, MIT Press, Cambridge, MA
- Barth, J.R., G. J. Caprio Jr., and R. Levine, (2004), "Bank regulation and Supervision: What Works Best?", *Journal of Financial Intermediation*, Vol. 13, pp. 205-248
- Barth, J.R., G.J. Caprio Jr., and R. Levine, (2006), *"Rethinking Bank Supervision and Regulation: Until Angels Govern"*, Cambridge University Press, Cambridge, UK
- Barth, J.R., G.J. Caprio Jr., and R. Levine, (2001), *"The regulation and supervision of bank around the world: a new database"*. In: Litan, R.E., Herring, R. (Eds.), *Integrating Emerging Market Countries into the Global Financial System*. Brookings-Wharton Pap. Financial Services. Brookings Institution Press, pp. 183-240

BCBS-BIS, (1988a), "International Convergence of Capital Measurement and Capital Standards", BIS Basel Committee on Banking Supervision, Basel

BCBS-BIS, (1998b), "Enhancing Bank Transparency: Public Disclosure and Supervisory Information That Promote Safety and Soundness in Banking Systems", BIS Basel Committee on Banking Supervision, Basel

BCBS-BIS, (2004), "International Convergence of Capital Measurement and Capital Standards: A Revised Framework", BIS Basel Committee on Banking Supervision, Basel

BCBS-BIS, (2006), "International Convergence of Capital Measurement and Capital Standards: A Revised Framework", BIS Basel Committee on Banking Supervision, Basel

BCBS-BIS, (2010), "Basel III: A Global Regulatory Framework for More Resilient Banks and Banking Systems", BIS Basel Committee on Banking Supervision, Basel

BCBS-BIS, (2011), "Basel III: A Global Regulatory Framework for More Resilient Banks and Banking Systems", (revised version), BIS Basel Committee on Banking Supervision, Basel

BCBS-BIS, (2013), "Basel III: The Liquidity Coverage Ratio and Liquidity Risk Monitoring Tools", BIS Basel Committee on Banking Supervision, Basel

BCBS-BIS, (2016), "Literature Review on Integration of Regulatory Capital and Liquidity Instruments," Working Paper No. 30, Bank for International Settlements, Basel Committee on Banking Supervision, Basel

BCBS-BIS, (2017), "Basel III: Finalising Post-Crisis Reforms", Bank for International Settlements, Basel Committee on Banking Supervision, Basel

BCBS-BIS, (2018a), "Global Systemically Important Banks: Revised Assessment Methodology and the Higher Loss Absorbency Requirement", BIS Basel Committee on Banking Supervision, Basel

BCBS-BIS, (2018b), "Sound Practices: Implications of Fintech Developments for Banks and Bank Supervisors", BIS Basel Committee on Banking Supervision, Basel

BCBS-BIS, (2018c), "Basel III Monitoring Report. October 2018", BIS Basel Committee on Banking Supervision, Basel

BCBS-BIS, (2019), "Proportionality in Bank Regulation and Supervision: A Survey on Current Practices", BIS Basel Committee on Banking Supervision, Basel

Beltratti, A., and R. M. Stulz, (2012), "The Credit Crisis around the Globe: Why Did Some Banks Perform Better?" *Journal of Financial Economics*, Vol. 105 pp. 1-17

Berg, T., and C. Kaserer, (2015), "Does Contingent Capital Induce Excessive Risk-Taking?" *Journal of Financial Intermediation* Vol. 24 No. 3 pp. 356-385

Berger, A. N., (1995), "The Relationship between Capital and Earnings in Banking." *Journal of Money, Credit and Banking*, Vol. 27 pp. 432-456

Berger, A. N., and C. H. S. Bouwman, (2009), "Bank Liquidity Creation," *Review of Financial Studies* Vol. 22 pp. 3779-3837

Berger, A. N., and C. H. S. Bouwman, (2013), "How Does Capital Affect Bank Performance during Financial Crises?" *Journal of Financial Economics* Vol. 109 No. 1 pp. 146-176

Berger, A. N., R. DeYoung, M. J. Flannery, D. Lee, and Ö. Öztekin, (2008), "How Do Large Banking Organizations Manage Their Capital Ratios?" *Journal of Financial Services Research* Vol. 34, No. 2-3 pp. 123-49.

Billet, M., J. Garfinkel and E. O'Neal, (1998), "The Cost of Market Versus Regulatory Discipline in Banking", *Journal of Financial Economics*, Vol. 48, pp. 333-358

BIS, (2014), *“Impact and Implementation Challenges of the Basel Framework for Emerging Market, Developing and Small Economies”*, No. 27, BIS Basel Consultative Group, Basel

Boyd, J., De Nicolo, G., and E. Loukoianova, (2009), *“Banking Crises and Crisis Dating: Theory and Evidence”*, IMF Working Paper 09/141, International Monetary Fund, Washington

Brunschwig, S., B. Carrasco, T. Hayashi, and H. Mukhopadhyay, (2011), *“The Global Financial Crisis: Impact on Asia and Emerging Consensus”*, ADB South Asia Working Paper Series No.3. Manila.

Caprio, G., and Klingebiel, D., (1996), *“Dealing with Bank Insolvencies: Cross Country Experience”*, Policy Research Working Paper no. 1620, The World Bank, Washington, D.C.

Èihák Martin, Aslý Demirgüç-Kunt, Erik Feyen and Ross Levine, (2012), *“Benchmarking Financial Systems around the World”*, The World Bank Financial and Private Sector Development Vice Presidency and Development Economics Vice Presidency, Policy Research Working Paper 6175

Èihák, M., and Klaus Schaeck, (2007), *“How Well Do Aggregate Bank Ratios Identify Banking Problems”*, IMF Working Paper 07/275, International Monetary Fund, Washington DC

Demirgüç-Kunt Asli, Enrica Detragiache, and Thierry Tressel, (2006), *“Banking on the Principles: Compliance with Basel Core Principles and Bank Soundness”*, World Bank Policy Research Working Paper 39544

Demirgüç-Kunt, A., and E. Detragiache, (1998), *“The Determinants of Banking Crises in Developing and Developed Countries,” IMF Staff Papers*, Vol. 45, No. 1, pp. 81-109

Demirgüç-Kunt, A., and E. Detragiache, (1999), *“Monitoring Banking Sector Fragility: A Multivariate Logit Approach”*. IMF Working Paper 99/147, International Monetary Fund, Washington DC

Demirgüç-Kunt, Aslý, and Enrica Detragiache, (2002), *“Does Deposit Insurance Increase Banking Sector Fragility?”*, *Journal of Monetary Economics*, Vol. 49, No. 7, pp. 1373-1406, November 2002

Demirgüç-Kunt, Aslý, and Enrica Detragiache, (2005), *“Cross-Country Empirical Studies of Systemic Bank Distress: A Survey”*, *National Institute Economic Review*, No. 192, pp. 68-83, April 2005

Fromlet, Hubert, (2008), *“Financial Literacy and its Benefits on a Household, Corporate and Macroeconomic Level”*, Working Paper, Baltic Business School, Kalmar/Sweden, & Blekinge Institute of Technology, Ronneby/Sweden, April 2008

Gelos, Gaston, and Shang-Jin Wei, (2005), *“Transparency and International Portfolio Holdings”*, *Journal of Finance*, Vol. 60, pp. 2987-3020, December 2005

Glaeser, E; R. La Porta, F. Lopez de Silanes and A. Shleifer, (2004), *“Do institutions cause growth?”* *Journal of Economic Growth*, Vol. 9, No. 3, pp. 271-303

Glennerster, Rachel, and Yongseok Shin, (2004), *“Is Transparency Good for You and Can the IMF Help?”*, IMF Working Paper No. 03/132

IMF, (2007), *“Financial Soundness Indicators: Experience with the Coordinated Compilation Exercise and Next Steps”*. International Monetary Fund, 2007, Public Information Notice (PIN) No. 07/135, November 20, 2007

IMF, (2013), *“Modifications to the Current List of Financial Soundness Indicators”*, International Monetary Fund, Washington DC

IMF, (2019), "*Financial Soundness Indicators*," International Monetary Fund, Washington DC

Laeven, L., and F. Valencia, (2012), "*Systemic Banking Crises: An Update*", IMF Working Paper 12/163, International Monetary Fund, Washington DC

Levine, Ross, Gerard Caprio Jr., and James R. Barth, (2001), "*The Regulation and Supervision of Banks around the World - a New Database*," Policy Research Working Paper Series 2588, The World Bank, Washington DC

Minoiu, C., and A.J. Reyes, (2010), "*A network analysis of global banking: 1978-2009*", IMF Working Paper 11/74, International Monetary Fund, Washington DC

Navajas, M. C. and A. Thegeya, (2013), "*Financial Soundness Indicators and Banking Crises*" IMF Working Paper 13/263, International Monetary Fund, Washington DC

Podpiera, Richard, (2004), "*Does Compliance with Basel Core Principles Bring Any Measurable Benefits?*", IMF Working Paper No. 04/204, International Monetary Fund, Washington DC

Reinhart, C. M., and K.S. Rogoff, (2008), "*Is the 2007 U.S. sub-prime Financial Crisis so different? An international historical comparison*", NBER Working Paper 13761, National Bureau of Economic Research, Cambridge

Sun, T., (2011), "*Identifying Vulnerabilities in Systemically Important Financial Institutions in a Macro-financial Linkages Framework*", IMF Working Paper 11/11, International Monetary Fund, Washington DC

Sundararajan, V., C. Enoch, A. San Jose, P. Hilbers, R. Krueger, M. Moretti, and G. Slack, (2002), "*Financial Soundness Indicators: Analytical Aspects and Country Practices*," Occasional paper 212, Washington: International Monetary Fund, Washington DC

Sundararajan, V., David Marston, and Ritu Basu, (2001), "*Financial System Standards and Financial Stability – The Case of Basel Core Principles*", IMF Working Paper 01/62, International Monetary Fund, Washington DC

Tadesse, S., (2001), "*Financial Architecture and Economic Performance: International Evidence*", William Davidson Working Paper Number 449, University of Michigan, Michigan, USA

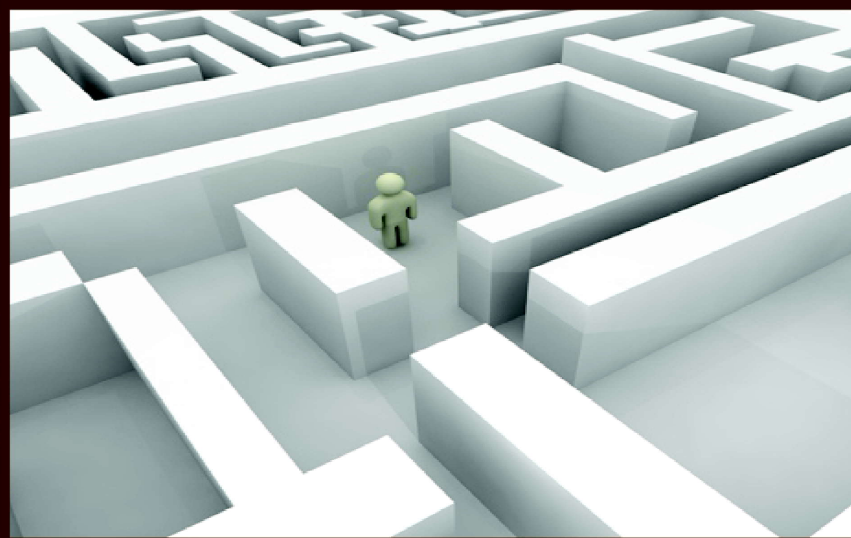
Valla Natacha, Béatrice Saes-Escorbia and Muriel Tiesset, (2006), "*Bank Liquidity and Financial Stability*", *Financial Stability Review*, No.9, pp. 40-47

World Bank, (2019-20), "*Bank Supervision and Regulation A decade after Global Financial Crisis*", Global Financial Development Report, World Bank, Washington DC, USA

Zdanowicz, John S., William W Welch and Simon J Pak, (1995), "*Capital Flight from India to US through Abnormal Pricing in International Trade*", *Finance India*, Vol IX No 3, September 1995

Zdanowicz, John S., William W Welch and Simon J Pak, (1996), "*Capital Flight from India to US through Abnormal Pricing in International Trade*", *Finance India*, Vol X No 4, December 1996

Capital Structure Decisions



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