

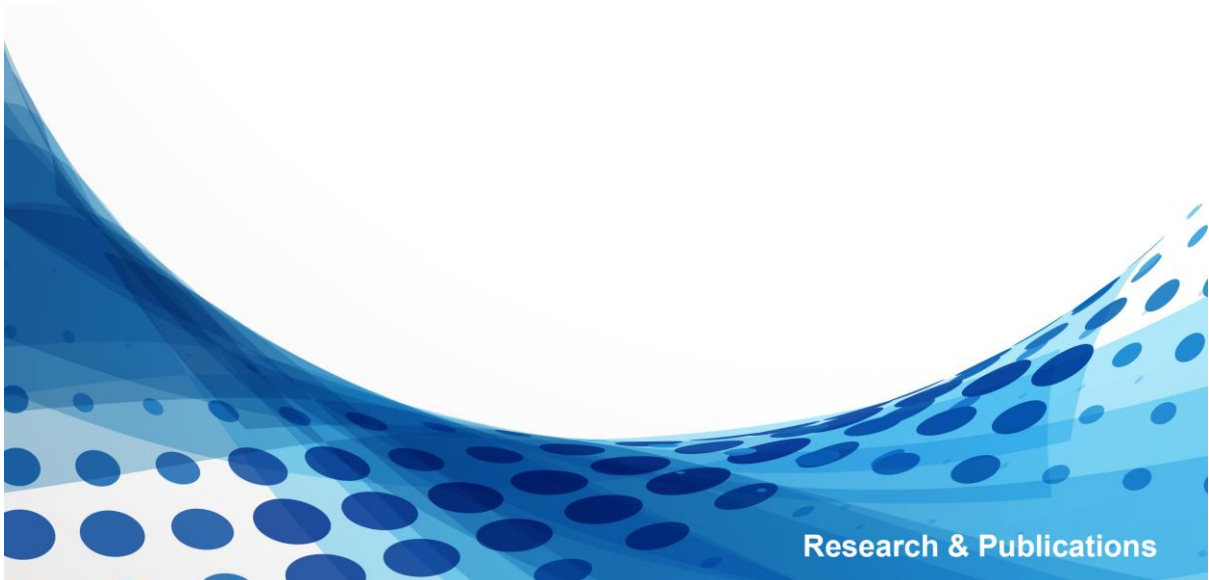


भारतीय प्रबंध संस्थान अहमदाबाद
INDIAN INSTITUTE *of* MANAGEMENT AHMEDABAD

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Conceptualizing ‘Systemically Important Technological Institutions’ as Too Big to Fail Entities: Moving the Insolvency Goal Post

M P Ram Mohan & Sai Muralidhar K



Research & Publications

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October 2023

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Conceptualizing ‘Systemically Important Technological Institutions’ as Too Big to Fail Entities: Moving the Insolvency Goal Post

M P Ram Mohan* & Sai Muralidhar K**

Abstract

The concept of *Too Big To Fail* (TBTF) has, for the longest time, been associated with systemically important banks, insurance companies and other financial institutions. The emergence of Big Tech companies, which permeates global markets, challenges the traditional notions of TBTF. Big Tech companies growing size and interconnectedness to the global economy have led to concerns emerging in the domains of antitrust law, data privacy laws, and financial stability. A key facet of financial stability regulation is the development of robust insolvency resolution frameworks to deal with potential failures of TBTF companies. The paper analyses whether Big Tech companies pose systemic risks to the financial system and the broader economy and, consequently, if they are TBTF, should there be special insolvency resolution frameworks akin to other systemically important institutions. The systemic risks Big Techs pose today may be substantially higher than traditional TBTF firms due to their deep interconnectedness with financial institutions. The paper explores the concept of Systemically Important Technological Institutions and the challenges in designating them as TBTF.

Keywords: Big Tech, Too Big To Fail (TBTF), Systemic Risk, Systemically Important Technological Institutions (SITI)

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We are thankful to Pratik Datta, Saravanan A, Praachi Misra and Sriram Prasad for their thoughtful comments on the earlier version of the paper.

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Introduction

Too Big to Fail (TBTF) entities have long threatened financial and economic stability of various countries and the world. The term 'Too Big to Fail' refers to an entity discouraged from failing due to its size and interconnectedness and entering liquidation due to unfavourable adverse consequences to the financial system and the broader economy.¹ The term has been attributed to Congressional hearings where Congressman Stewart McKinney famously said, "We have a new kind of bank. It is called too big to fail".²

The failure of any entity has direct and indirect adverse effects. For instance, shareholders, creditors, and employees are directly affected, while a particular industry sector and to an extent society at large are indirectly affected. Ordinarily, domestic insolvency regimes limit the losses caused by insolvency.³ What distinguishes these TBTF entities from regular entities is the inability to effectively distribute losses by domestic insolvency laws in the case of the former. TBTF entities are subject to special insolvency resolution frameworks. Before the development of such special insolvency regimes, the only option available to governments was to bailout these entities given their size and interconnectedness to the economy. However, using bailouts as a tool generates moral hazard among TBTF firms and encourages risky business strategies that could lead to more failures.⁴

The frameworks around TBTF were largely designed to focus on Banks and its deposits till the 2008 subprime mortgage crisis, after which regulators realized the need to broaden the scope of TBTF to include large NBFCs and insurance companies.⁵ As a result, several financial entities began to be categorized as "Systemically Important Financial Institutions" (SIFI) and Systemically Important Insurers (SII) and became subject to special resolution frameworks.⁶ Therefore, it can be seen that the scope of TBTF, by its very nature, is constantly changing.

¹ 'Statement by Ben S. Bernanke' (Financial Crisis Inquiry Commission hearing dated 02/09/2010), Washington DC

² Stewart McKinney, Inquiry Into Continental Illinois Corp. and Continental Illinois National Bank: Hearings Before the Subcommittee on Financial Institutions Supervision, Regulation, and Insurance of the Committee on Banking, Finance, and Urban Affairs, House of Representatives, Ninety-Eighth Congress, Second Session, September 18, 19 and October 4, 1984, 300

<https://fraser.stlouisfed.org/title/inquiry-continental-illinois-corp-continental-illinois-national-bank-745>

³ George G Kaufman, 'Too Big to Fail in Banking: What Does It Mean?' (2014) 13 Journal of Financial Stability 214.

⁴ Yunjeen Kim, 'Bank Bailouts and Moral Hazard? Evidence from Banks' Investment and Financing Decisions' [2013] SSRN Electronic Journal <<http://www.ssrn.com/abstract=2330660>> accessed 18 July 2023.

⁵ Robert R Bliss and George G Kaufman, 'Resolving Large Complex Financial Institutions- The Case for Reorganization By'.

⁶ Ben Pierce, 'The "Too Big to Fail" Penalty: A New Era of Insurance Regulation in the Wake of the Financial Crisis' (2016) 3 Emory Corp. Governance & Accountability Rev 225.

The present study examines whether the TBTF framework's goalpost must be moved again to include a new category of entities in the digital world. Specifically, this paper analyses whether Big Tech entities today are TBTF and if they pose a systemic risk, thus requiring them to be categorized as systemically important technological institutions (SITIs)⁷ and subject to special resolution frameworks.

Globally, the five largest tech companies presently by market capitalization in the NASDAQ are Facebook (presently Meta), Apple, Amazon, Microsoft & Google (Alphabet Inc) (collectively referred to as 'FAAMG').⁸ These five entities today account for a market capitalization of \$ 8.75 Trillion which is approximately 33.1 % of the total market cap of the NASDAQ.⁹ While their size alone does not make them TBTF, it is a relevant factor. The International Monetary Fund (IMF) has noted that the growing interconnectedness of Big Tech in the Financial Market Infrastructure and Central Counterparties¹⁰ is a concern for financial stability.¹¹ Big Tech has been growing at an unprecedented rate, and today the IMF considers some Big Tech entities important enough to act as a single point of failure and a catalyst for a financial crisis.¹² The deep interdependencies created by Big Tech companies providing critical services to financial and non-financial industries have made them too critical to fail.¹³ The entry of Big Techs into the financial sector has exacerbated the risk posed by them.¹⁴

TBTF entities are ordinarily subject to ex-ante prudential regulations to try and limit their systemic risk and subject to ex-post special insolvency resolution regimes, which limit the adverse externalities caused by failure.¹⁵

⁷ The term Systemically Important Technological Institutions (SITI) was coined by Dr Carl Öhman and Professor Nikita Agarwal in 2020. See, Carl Öhman and Nikita Aggarwal, 'What If Facebook Goes down? Ethical and Legal Considerations for the Demise of Big Tech' (2020) 9 Internet Policy Review <<https://policyreview.info/articles/analysis/what-if-facebook-goes-down-ethical-and-legal-considerations-demise-big-tech>> accessed 12 December 2022.

⁸ FAAMG was first coined by Goldman Sachs in 2017. 'FORGET FANG: Goldman Adopts a New Acronym for the Most Powerful Tech Stocks Driving the Market' (*Business Insider*) <<https://www.businessinsider.in/forget-fang-goldman-adopts-a-new-acronym-for-the-most-powerful-tech-stocks-driving-the-market/articleshow/59073956.cms>> accessed 25 March 2023.

⁹ As on 23/03/2023

¹⁰ Central Counterparty Clearing houses facilitate trading in securities and derivatives markets both domestically and internationally.

¹¹ Parma Bains, *BigTech in Financial Services Regulatory Approaches and Architecture* (International Monetary Fund 2022), 7.

¹² *ibid*, 8.

¹³ Tobias Adrian and others, 'BigTech in Financial Services' (*IMF*) <<https://www.imf.org/en/News/Articles/2021/06/16/sp061721-bigtech-in-financial-services>> accessed 13 May 2023.

¹⁴ Bains (n 11).

¹⁵ Kaufman (n 3).

Several countries, including the E.U., India and USA's regulatory authorities, have begun building frameworks around Big Tech entities. The first level of regulation involves regulatory architecture for Anti Trust, Data Privacy, and possibly certain prudential and capital regulations of SITIs.¹⁶ The second level of regulation would involve special insolvency frameworks for SITIs similar to that of SIFIs and SIIs. This is because insolvency regulation of TBTF entities is the last line of defence in mitigating the impact of systemic risks and preventing crises. While countries have attempted to make strides in regulating them under antitrust legislation, the second level of regulation of these entities has not been attempted by any country. It is necessary to acknowledge that prudential regulations may not always prevent entities from becoming TBTF or prevent bailouts.¹⁷ In the wake of the global financial crisis of 2008, a slew of prudential regulations were imposed on the banking sector, which were targeted at ending TBTF and bailouts in the banking sectors. Despite all these measures, the FDIC recently bailed out Silicon Valley Bank.¹⁸ Therefore, ex-ante prudential regulation alone cannot always ensure financial stability. An important ex-post regulator of financial stability is a robust insolvency resolution regime that allocates losses in a manner that causes the least damage. Therefore, the question arises whether Big Techs today are TBTF and require special insolvency regimes to maintain financial stability. The study does not look at insolvency resolution mechanisms as a tool to solve the systemic risks posed to the financial system and the broader economy but only as a tool to safeguard financial stability and mitigate the impact of these systemic risks should they arise. Crucially, special insolvency regimes would not stifle innovation and growth but only hedge against disruptions to financial stability by limiting adverse externalities.

The present study aims to look at the systemic importance of certain technological companies. The questions relating to the systemic risks posed by Big Tech was first raised by Carl Öhman and Nikita Aggarwal.¹⁹ There have been studies since that have looked at the systemic importance of tech companies.²⁰ However, these studies largely focused on the socio-political

¹⁶ 'FinTech and Market Structure in the COVID-19 Pandemic- Implications for Financial Stability' (Financial Stability Board 2022) <<https://www.fsb.org/wp-content/uploads/P210322.pdf>> accessed 3 July 2023.

¹⁷ Marcelo M Prates, 'Why Prudential Regulation Will Fail to Prevent Financial Crises: A Legal Approach' (2013) Working Paper 335 Banco Central Do Brasil <<http://www.ssrn.com/abstract=2375470>> accessed 19 July 2023.

¹⁸ 'The Silicon Valley Bank Collapse: Prudential Regulation Lessons for Europe and the World' (CEPR, 20 March 2023) <<https://cepr.org/voxeu/columns/silicon-valley-bank-collapse-prudential-regulation-lessons-europe-and-world>> accessed 24 July 2023.

¹⁹ Öhman and Aggarwal (n 7).

²⁰ Lindsay Jones and Tim Samples, 'On the Systemic Importance of Digital Platforms' [2022] SSRN Electronic Journal <<https://www.ssrn.com/abstract=4040269>> accessed 16 January 2023; Caleb N Griffin, 'Systemically Important Platforms' (2022) 107 Cornell Law Review.

impacts and risks posed by the technological companies. While these are very relevant questions, they are beyond the scope of the present paper. Recently, there has been some literature that has looked at the systemic risk posed by these tech companies from a financial and economic lens.²¹ Financial regulators such as the Financial Stability Board (FSB) and the Bank for International Settlements (BIS) have also begun to examine the risks to financial stability posed by big techs.²² The present study adds to this growing literature on the systemic importance of big tech and in particular examines the role that insolvency resolution regimes would play in effectively regulating big tech companies.

The paper is organized as follows. The first part traces the evolution of Too Big To Fail entities. The second part conceptualizes systemic importance and when an institution or sector would be considered systemically important. It looks at when an entity poses a risk to the stability of a country's financial and economic system or globally. The third part analyses the existing sectors where systemic importance has been defined in relation to insolvency, namely finance and insurance, and looks at the metrics used for such a determination. The fourth part defines technological institutions and explores the metrics that may be used to determine whether a technological institution is systemically important. The fifth part discusses unique challenges while regulating SITIs. Finally, the study concludes by looking at the various areas where regulations are required to deal effectively with SITIs.

1. Conceptualizing Too Big To Fail

A firm is considered TBTF when its failure causes large adverse externalities that disrupt the financial system's stability and credit provision and creates a spillover effect into the real economy.²³ Two forms of regulations characterize TBTF firms. Firstly, prudential regulations and other ex-ante measures are designed to minimize the risks and exposures faced by the companies or ensure it does not fail. Secondly, a special resolution regime allocates losses in these firms differently from regular insolvency proceedings.²⁴ Although TBTF uses the term 'Too Big', size is not the only factor determining whether a company is TBTF. The size of the

²¹ Nordine Abidi and Ixart Miquel-Flores, 'Too Tech to Fail?' (2022) 2022 – no. 124 EBI Working Paper Series; Kevin Werbach and David T Zaring, 'Systemically Important Technology' [2022] Texas Law Review, Forthcoming <<https://www.ssrn.com/abstract=4053890>> accessed 27 September 2023.

²² 'BigTech in Finance: Market Developments and Potential Financial Stability Implications' (Financial Stability Board 2019); Juan Carlos Crisanto and others, 'Big Tech Regulation: What Is Going On?' [2021] FSI Insights on policy implementation, BIS.

²³ 'Solving the Too Big to Fail Problem', William C Dudley, Second Annual Business Meeting and Conference, New York, 2012.

²⁴ Kaufman (n 3).

externalities depends on how interconnected the entity is with the financial industry and the essentiality of its services for the smooth functioning of the financial system.²⁵ Further, one must also look at the ease of substitutability and the likelihood of contagion in case of failure.

One of the earliest instances of a government bailout of a TBTF firm resulted from the Bengal Famine in 1770. The loss of manpower in Bengal due to the deaths caused by the famine led to a sharp increase in costs for the East India Company (EIC), and revenues swiftly fell.²⁶ This led to widespread fear and caused a run on EIC's shares, bringing it to the verge of bankruptcy in 1772.²⁷ The Parliament in the United Kingdom decided that EIC could not be allowed to fail as it was needed for effectively administering the Indian subcontinent, and they accordingly enacted the Regulating Act of 1773.²⁸ The British state also lent EIC 14,00,000 pounds to prevent bankruptcy,²⁹ making it one of the earliest instances of a state bailing out an entity due to its importance to financial stability. A consequence of the bailout package was the enactment of the Tea Act of 1773 in their colonies in North America which raised taxes on those colonies and helped recover the monies spent on the bailout.³⁰

In the USA, in the 1970s and 80s, there occurred a spate of bailouts by the federal government to save failing banks. The first was of the Bank of Commonwealth in the year 1972, which was followed by Franklin National in 1974 and finally the First Pennsylvania Bank in 1980, after which the Continental Illinois National Bank Bailout took place in 1984.³¹ The Federal Deposit Insurance Corporation (FDIC)³² did most of these bailouts under the essentiality provisions under the Federal Deposit Insurance Corporation Act of 1950, which postulated that only banks essential to the community were allowed to be bailed out (hereinafter referred to as "community standard test").³³ However, it is pertinent to note that between 1970 and 1984, 72% of failed banks were acquired by another bank.³⁴ Certain larger banks could not be acquired due to restrictions on out-of-state acquisitions and their size, which were often bailed out. The spate

²⁵ Saule T Omarova, 'The "Too Big To Fail" Problem' (2019) 103 Minnesota Law Review 2495.

²⁶ Peter Frankopan, *The Silk Roads: A New History of the World* (Bloomsbury 2015), 261.

²⁷ *ibid.*

²⁸ Phillip Lawson, *The East India Company, A Brief History* (1st edn, Routledge, Taylor and Francis 1993), 121.

²⁹ *ibid.*

³⁰ Frankopan (n 7) at 261.

³¹ George Nuriisso and Edward Simpson Prescott, 'The 1970s Origins of Too Big to Fail' [2017] Economic Commentary (Federal Reserve Bank of Cleveland) 1, 2-3.

³² The FDIC is an independent agency created by the Congress tasked with ensuring financial stability and public trust in the financial system.

³³ 'FDIC: Historical Timeline' <<https://www.fdic.gov/about/history/timeline/1950s.html>> accessed 25 March 2023.

³⁴ Nuriisso and Prescott (n 12) at 3.

of bailouts led to the FDIC's functioning being freshly envisaged under the Federal Deposit Insurance Corporation Improvement Act of 1991 (hereinafter referred to as "FDICI Act").

Consequentially, the essentiality doctrine/community standard test was replaced with the systemic risk test.³⁵ Under this test, banks were only bailed out if the existence of systemic risk was proved.³⁶ The departure from the essentiality doctrine meant open assistance from the government could only be provided when alternative measures would cost more than the sum provided under such assistance.³⁷ While regulators could no longer invoke the essentiality clause, the new test ensured flexibility in certain instances. The new test was one of low cost. For example, at the time of insolvency, the Commonwealth Bank, based on its assets, only constituted 0.1% of the GDP, and Pennsylvania Bank, when it went under, had assets worth 0.3% of the GDP.³⁸ Therefore, it would be difficult to claim that either of these banks posed a systemic risk. Such bailouts underscored the necessity for the new FDIC legislation. The need for a major bailout did not occur until the 2008 global financial crisis.

Since the 2008 global financial crisis, a concerted effort has been made to develop separate resolution mechanisms to resolve TBTF companies' failure effectively. The TBTF problem can only be solved by creating a regulatory landscape where systemically important institutions can fail without causing a severe fallout on the financial system and the broader economy or by barring systemically important institutions from existing.³⁹ An approach consisting of solely ex-ante or prudential measures that aim to prevent financial crises is inherently flawed, as it is inherently impossible to avoid a financial crisis from occurring.⁴⁰ This is not to say that ex-ante measures must not be developed but that their effectiveness increases manifold when paired with ex-post measures such as a robust insolvency framework. Particularly in the technology industry, the development of regulatory frameworks does not keep pace with the development. The recurrence of financial crises was succinctly noted by economist John Kenneth Galbraith when he stated –

³⁵ *ibid* at 4.

³⁶ Section 141 (a)(4)(G), Federal Deposit Insurance Corporation Improvement Act, 1991

³⁷ FDIC, 'History of the Eighties - Lessons for the Future, Volume 1' Chapter 7, page 248 (Division of Research and Statistics, FDIC) <https://www.fdic.gov/bank/historical/history/235_258.pdf> accessed 23 March 2023.

³⁸ Nurisso and Prescott (n 12), at 4.

³⁹ Martin Hellwig, 'Twelve Years after the Financial Crisis—Too-Big-to-Fail Is Still with Us' (2021) 7 *Journal of Financial Regulation* 175.

⁴⁰ Prates (n 17).

"Recurrent speculative insanity and the associated financial deprivation and larger devastation are, I am persuaded, inherent in the system. Perhaps it is better that this be recognized and accepted."⁴¹

Acknowledging that ex-ante regulation is insufficient to tackle the TBTF problem would lead to a greater focus on special insolvency regimes for systemically important institutions. The necessity for the same is due to the inability of the existing domestic insolvency legislation to resolve TBTF entities in a manner that limits the negative indirect externalities caused by such a failure.⁴² Further, the alternative of government-funded bailouts to such entities creates a moral hazard problem, leading to them not properly analyzing their risk.⁴³ This also causes a heavy burden on the taxpayers when governments have to spend massive sums of money on rescuing these entities.⁴⁴ Therefore, it is well established that TBTF companies require a separate resolution framework.

2. Systemic Importance

To understand whether certain technological institutions are Systemically Important Technological Institutions (SITIs), it is necessary to understand systemic risk and when an entity poses a systemic risk to the financial system and consequently becomes Systemically Important. Traditionally, notions of systemic risk have largely been analyzed through the lens of financial companies and their impact on the financial system.⁴⁵ However, systemic risk and the concept of TBTF have often extended to various non-financial firms.⁴⁶ To understand whether Big Tech companies today are TBTF, it is necessary to examine whether their failure would pose a systemic risk to the financial system. Failure of a Big Tech Company can take

⁴¹ John Kenneth Galbraith, *A Short History of Financial Euphoria* (2nd edn, Whittle Books 1993).

⁴² Clas Wihlborg and Tadeusz Kowalski, 'Insolvency Procedures and "Too Big To Fail" in Banking'.

⁴³ Imad A Moosa, *The Myth of Too Big to Fail* (Palgrave Macmillan UK 2010), 13 <<http://link.springer.com/10.1057/9780230295056>> accessed 25 March 2023.

⁴⁴ Deborah Lucas, 'Measuring the Cost of Bailouts' (2019) 11 Annual Review of Financial Economics 85; Federico Mor, 'Bank Rescues of 2007-09: Outcomes and Cost' (Office for Budget Responsibility); Regis Barnichon, 'The Financial Crisis at 10: Will We Ever Recover?' (Federal Reserve Bank of San Francisco 2018).

⁴⁵ Adam J Levitin, 'The InDefense of Bailouts' (2010) 99 Georgetown Law Journal 435.

⁴⁶ This was most recently seen in sectors such as Oil, Gas, and Aviation which received bailouts and concessions during the COVID-19 pandemic. See Alan Rappeport and Niraj Chokshi, 'Crippled Airline Industry to Get \$25 Billion Bailout, Part of It as Loans' *The New York Times* (14 April 2020) <<https://www.nytimes.com/2020/04/14/business/coronavirus-airlines-bailout-treasury-department.html>> accessed 30 March 2023; Climate Nexus, 'Fossil Fuels Received an \$8.2 Billion Tax Bailout and Slashed Nearly 60,000 Jobs Last Year' <<https://bailoutwatch.org/analysis/fossil-fuel-firmsslashed-nearly-60000-jobs-in-2020>> accessed 22 July 2023; See also, Juho Vuojela and Alberto Rascon, 'Too Big to Fail Applied to Non-Financial Companies' in Jochen Schellinger, Kim Oliver Tokarski and Ingrid Kissling-Näf (eds), *Resilienz durch Organisationsentwicklung: Forschung und Praxis* (Springer Fachmedien 2022) <https://doi.org/10.1007/978-3-658-36022-1_13> accessed 22 July 2023.

two forms. Firstly, operational failure in the form of cyber attacks or system failures that often last for short periods of time. Secondly, failure in the form of financial distress, which would lead to the company having to restructure or enter insolvency. The operational or financial failure of a Big Tech Company has the potential to create financial stability risks.⁴⁷ While operational failures would have to be addressed through development of operational resilience policies, financial failures would have to be addressed by a plethora of regulations including insolvency regulations.

2.1 Defining Systemic Risk

To better understand systemic risk, it is necessary to look at how scholars and financial regulators have defined systemic risk in the context of the financial system. Some relevant definitions are as follows-

The Commodity Futures Trading Commission of the USA defines systemic risk as -

"The risk that a default by one market participant will have repercussions on other participants due to the interlocking nature of financial markets."⁴⁸

Professor Kaufman defines systemic risk in Bank Failures as⁴⁹

"The probability that cumulative losses will occur from an event that ignites a series of successive losses along a chain of institutions or markets comprising a system"

Other authors define systemic risk in the banking system as –

"Systemic risk can be defined as the potential for a modest economic shock to induce substantial volatility in asset prices, significant

⁴⁷ 'BigTech in Finance: Market Developments and Potential Financial Stability Implications' (n 22).

⁴⁸ 'CFTC Glossary | CFTC'

<https://www.cftc.gov/LearnAndProtect/EducationCenter/CFTCGlossary/glossary_s.html> accessed 28 March 2023.

⁴⁹ George G Kaufman, 'Bank Failures, Systemic Risk, and Bank Regulation' 16 Cato Journal.

reductions in corporate liquidity, potential bankruptcies and efficiency losses."⁵⁰

The European Central Bank defines Systemic Risk as⁵¹ –

"The risk that financial instability becomes so widespread that it impairs the functioning of a financial system to the point where economic growth and welfare suffer materially."

While discussing systemic risk assessment, the Deputy Governor of the Reserve Bank of India remarked that Systemic Risk exists from two perspectives. Firstly, in the form of a systemic event or a common shock that cripples the entire domestic economy. Secondly, through contagion, when the failure of one institution affects the stability of other institutions.⁵²

There have also been attempts to define systemic risk through legislation. One such legislation is the Payments and Settlements Act,⁵³ enacted in 2007 in India. The act defines Systemic Risk as⁵⁴ –

Section 2(o) - "systemic risk" means the risk arising from—

- (i) the inability of a system participant to meet his payment obligations under the payment system as and when they become due; or
- (ii) any disruption in the system, which may cause other participants to fail to meet their obligations when due and is likely to have an impact on the stability of the system:

Of course, this is a limited definition for payment gateways and providers. System participants under this legislation refer to Banks and any other participants in the payment system, including the system provider operating the payment service.⁵⁵

⁵⁰ Paul Kupiec and David Nickerson, 'Assessing Systemic Risk Exposure from Banks and GSEs Under Alternative Approaches to Capital Regulation' (2004) 28 *The Journal of Real Estate Finance and Economics* 123.

⁵¹ European Central Bank (ECB), 'The Concept of Systemic Risk'.

⁵² KC Chakrabarty, 'Systemic Risk Assessment – The Cornerstone for the Pursuit of Financial Stability' <<https://rbidocs.rbi.org.in/rdocs/Speeches/PDFs/DGSISTS030412.pdf>> accessed 5 May 2023.

⁵³ The objective of the act was to regulate payment systems in India and designate RBI as the supervisory authority over them.

⁵⁴ Section 2(o), Payment and Settlements Act, 2007

⁵⁵ Section 2(p) & (q), Payment and Settlements Act, 2007

There is no single globally accepted definition of systemic risk. What one considers systemic risk is merely a market correction by others.⁵⁶ Despite a wide definition of systemic risk, two elements largely exist in most definitions. Firstly, a catalyst event that causes the spread of systemic risk and causes widespread contagion. Historically, the catalyst event has been the failure of a financial entity.⁵⁷ Secondly, the final manifestation of the effects of systemic risk always takes the form of an adverse impact on citizens' economic growth and welfare. A literal interpretation of the term "systemic risk" would mean risk posed to a system. The system here is the financial system, and the risk is the financial system's stability.⁵⁸ For the longest time, financial institutions have been accorded the status of being systemically important by examining whether their failure would generate systemic risk for other financial institutions and the system at large.⁵⁹ However, such an analysis of systemic risk is extremely narrow and does not account for macroeconomic impacts broadly.⁶⁰ For example, the failure of multiple companies in a particular system can often pose systemic risk. A recent study looked at systemic risks in the broader economy by looking at the interconnectedness of firms. An ordinary firm that fails disrupts its suppliers and the entities it supplies goods/services to. Therefore, the more connected a firm is with other firms, its failure would cause more systemic impact.⁶¹ The study found that if Amazon suffered a one percent economic shock, the highest loss suffered by the broader economy would be 77 Billion dollars.⁶² While the contagion effect of a revenue shock in of itself does not prove these entities are systemically important, it does merit a deeper examination of the systemic risks posed by non-financial companies including Big Tech. Therefore, any definition of systemic risk must account for the possibility that the failure of a non-financial entity may generate systemic risk to financial institutions and the broader financial system.⁶³ The question of which system faces the risk would vary depending on the entity in question, but a commonality among all definitions would be the financial system.

⁵⁶Remarks at a Research Conference on Risk Measurement and Systemic Risk, Washington, D.C.’

⁵⁷ For example, in the 2008 subprime mortgage financial crisis, the catalyst event was the failure of Lehmann Brothers.

⁵⁸Adam J Levitin, ‘The InDefense of Bailouts’ (2010) 99 Georgetown Law Journal 435, 446.

⁵⁹ Group of Ten, ‘Report on Consolidation in The Financial Sector’ <<https://www.bis.org/publ/gten05.pdf>> accessed 28 March 2023; IMF, BIS and FSB, ‘Guidance to Assess the Systemic Importance of Financial Institutions, Markets and Instruments: Initial Considerations’., See also Viral V Acharya and others, ‘Measuring Systemic Risk’ (2017) 30 Review of Financial Studies 2.

⁶⁰ Levitin (n 45).

⁶¹ Werbach and Zaring (n 21).

⁶² Jonathan Welburn and others, *Systemic Risk in the Broad Economy: Interfirm Networks and Shocks in the U.S. Economy* (RAND Corporation 2020) <https://www.rand.org/pubs/research_reports/RR4185.html> accessed 8 October 2023.

⁶³ Werbach and Zaring (n 21).

2.2 Dimensions of Systemic Risk

To identify whether an entity poses a systemic risk, it is necessary to understand how systemic risk transmits in the financial system and whether the failure of Big Tech institutions would also show a similar effect. Most Central Banks and scholars agree that systemic risk manifests in two dimensions – Contagion and Macroeconomic Shock.⁶⁴ This paper relies on Professor Adam J Levitin's description of various forms of Systemic Risk. Firstly, contagion is divided into two forms, i.e. counterparty contagion and information contagion, and secondly, Macroeconomic Shocks, which here refers to as Common Shocks.⁶⁵ These three forms are explained below-

a) Counterparty Contagion

Counterparty Contagion is, in essence, the domino effect caused by the failure of a single firm or industry.⁶⁶ The contagion to counterparties can take two forms. Firstly, obligor contagion, where the failure of Firm A leads to non-payment of dues to Firm B, which leads to Firm B being unable to pay its creditors and a cascading effect of such nature sweeps across the system. Secondly, supplier contagion, where the failure of Firm A would lead to the loss of future business to several other firms and causes their businesses to fail as well as a consequence of the loss of future business.⁶⁷ The 2008 global financial crisis due to subprime mortgages had a combination of obligor and supplier contagion.⁶⁸ Obligor contagion occurred when the collateralized debt obligations backed largely by Mortgage-based securities collapsed, leading to the failure of investment banks and large insurance companies.⁶⁹ A good example of this is Glitnir - an Icelandic Bank, which failed in 2008 due to the sale of some assets falling through at the last minute due to the Lehmann collapse during the 2008 subprime mortgage crisis and the denial of a loan renewal request that was, for all intents and purposes assumed to have been secured before the collapse.⁷⁰ The failure of Lehman froze the business of such banks and required them to be bailed out.⁷¹

⁶⁴ Chakrabarty (n 52); European Central Bank (ECB) (n 51); Steven Schwarcz, 'Systemic Risk' (2008) 97 Georgetown Law Journal 193.

⁶⁵ Levitin (n 45).

⁶⁶ *ibid*; Rudiger Dornbusch, Yung Chul Park and Stijn Claessens, 'Contagion: Understanding How It Spreads' (2000) 15 World Bank Research Observer 177.

⁶⁷ Levitin (n 45).

⁶⁸ *ibid*.

⁶⁹ *ibid*.

⁷⁰ 'House of Commons - Banking Crisis: The Impact of the Failure of the Icelandic Banks - Treasury' <<https://publications.parliament.uk/pa/cm200809/cmselect/cmtreasy/402/40206.htm>> accessed 29 March 2023.

⁷¹ *ibid*.

b) Information Contagion

Information Contagion occurs when a systemically important entity fails, leading to a loss of funding liquidity for other similarly placed entities as it is expected that they would fail soon.⁷² This can be seen in the case of Bank Runs,⁷³ where uninsured depositors begin to withdraw their deposits in other banks due to fear that a large bank's failure would lead to smaller banks' failure without properly understanding the root cause of such failure.⁷⁴ An example of this can be seen in the bank runs during the Great Depression. A stock market downturn and subsequent crash between August and October of 1929 led to the withdrawal of deposits en masse. Several ordinarily solvent banks became insolvent as well.⁷⁵ A more recent example is during the 2008 financial crisis. As explained earlier, the failure of Lehman led to the Glitnir Bank in Iceland failing. The failure of Glitnir exacerbated deposit withdrawals from another large Icelandic bank, Landsbanki.⁷⁶ As a result, they were unable to meet the liquidity demands and collapsed. The last Icelandic bank left standing, Kaupthing was thought to have enough liquidity to brace the information contagion taking place.⁷⁷ However, the U.K Government, under the Anti-Terrorism, Crime and Security Act, froze funds to the tune of £ 4 Billion that was being held with Landsbanki, Kaupthing, the Icelandic Central Bank, the Icelandic Government and the Iceland Financial Supervisory Authority.⁷⁸ This was an example of information contagion, except the market participant causing the same, here was a government instead of a panicked depositor.

c) Common Shock

The final mode in which systemic shock may transmit is through a common shock. This refers to a shock caused to a particular sector that leads to multiple entities in the sector

⁷² Jeremy Staum, 'Counterparty Contagion in Context: Contributions to Systemic Risk' in Jean-Pierre Fouque and Joseph A Langsam (eds), *Handbook on Systemic Risk* (1st edn, Cambridge University Press 2013) <https://www.cambridge.org/core/product/identifier/CBO9781139151184A164/type/book_part> accessed 29 March 2023.

⁷³ The NASDAQ defines a bank run as "A series of unexpected cash withdrawals caused by a sudden decline in depositor confidence or fear that the bank will be closed by the chartering agency, i.e. many depositors withdraw cash almost simultaneously. Since the cash reserve a bank keeps on hand is only a small fraction of its deposits, a large number of withdrawals in a short period of time can deplete available cash and force the bank to close and possibly go out of business." 'Bank Run (Bank Panic) Definition' <<https://www.nasdaq.com/glossary/b/bank-run-%28bank-panic%29>> accessed 14 July 2023.

⁷⁴ Hal S Scott, 'The Reduction of Systemic Risk in the United States Financial System' (2010) 33 Harv. J.L. & Pub. Pol'y 72.

⁷⁵ Schwarcz (n 64).

⁷⁶ Ingimundur Friðriksson, 'The Banking Crisis in Iceland in 2008' [2009] BIS.

⁷⁷ *ibid.*

⁷⁸ *ibid*; The Landsbanki Freezing Order 2008 2008.

simultaneously collapsing and causing broad harm to the economy.⁷⁹ This usually occurs due to an externality ranging from something as simple as a rise in interest rates to terrorist attacks. A good example of systemic risk caused by a common shock can be seen in the outbreak of the novel SARS COV-2 virus (COVID-19) and the ensuing pandemic and global lockdowns. The imposition of lockdowns halted travel both domestically and internationally in several countries. For example, in the United States, this caused a number of major airline companies, already operating on razor-thin margins, to face financial distress. This led to the airline industry getting a bailout in the form of a mixture of grants and loans by the Federal Government to the tune of \$25 Billion, as the airline industry is vital towards ensuring the stability of the economy.⁸⁰ The bailout provided was due to Air transportation being a critical cog in the smooth functioning of the global economy.⁸¹ Common shocks are usually unpredictable⁸² and can cause entire industries to collapse.⁸³

Another dimension is the procyclicality of systemic risk in the financial system, where there is a progressive build-up of financial fragility and the evolution of aggregate risk over time.⁸⁴ This theory propounds that systemic fragility is not due to an external shock, policy errors or an accident but is instead an endogenous development that takes place due to the normal functioning of the economy.⁸⁵ The procyclicality dimension of systemic risk focuses on risks that build up over time and those risks which are hidden. During economic booms, credit is provided freely, and the financial markets do not suffer from much volatility.⁸⁶ During such times, the risk is not properly assessed, and complacency in risk assessment, maintaining margin requirements, etc., becomes a risk source.⁸⁷ Therefore policies that attempt to regulate systemic risk must look at all three dimensions of systemic risk.

⁷⁹ Levitin (n 45).

⁸⁰ Rappeport and Chokshi (n 46).

⁸¹ Levitin (n 45).

⁸² Rappeport and Chokshi (n 46); 'Facts and Figures' <https://www.icao.int/sustainability/pages/facts-figures_worldconomydata.aspx> accessed 24 July 2023.

⁸³ European Central Bank (ECB) (n 51).

⁸⁴ Jaime Caruana, 'Systemic Risk: How to Deal with It?' <<https://www.bis.org/publ/othp08.htm>> accessed 5 May 2023; See also 'Understanding Procyclicality' <<https://knowledge.essec.edu/en/economy-finance/understanding-procyclicality.html>> accessed 27 July 2023, where procyclicality is defined as "the tendency of risk measurements to overestimate future risk in times of crisis, while underestimating it in normal times".

⁸⁵ Hyman P Minsky, *Chapter 6: A Theory of Systemic Fragility, Inancial Crises: Institutions and Markets in a Fragile Environment* (Wiley 1977) <https://digitalcommons.bard.edu/cgi/viewcontent.cgi?article=1230&context=hm_archive> accessed 6 May 2023.

⁸⁶ Caruana (n 84).

⁸⁷ *ibid.*

While these are the three common methods by which systemic risk often presents itself, an argument exists that systemic risk must look beyond the risk of failure. A case has been made that systemic importance must be considered as "a composite of power and externalities across a wide spectrum of economic, social, political, and even cultural matters."⁸⁸ However, to understand whether Big Tech companies are too big to fail, the paper mainly focuses on their systemic importance in the event of failure or default.⁸⁹ It must nevertheless be kept in mind that the socio-political aspects of systemic risk require due consideration as political stability is a precursor to financial stability.

2.3 Systemic importance as a socio-political function

The concepts of systemic importance and categorizing entities as TBTF are not merely an economic function but also a political one.⁹⁰ The failure of any entity would have some level of contagion on its counterparties and causes a shock in the system. The degree of contagion can be minor or can be major. Therefore, the question that arises is what level of systemic risk is required to be posed by an entity before it can be considered as TBTF.

Some authors argue that systemic risk is only an economic definition that looks at the stability of the financial system.⁹¹ They argue that the protection of financial stability would automatically ensure socio-political issues relating to poverty and unemployment are addressed. Nevertheless, a purely economic analysis without considering the political implications may lead to ineffective outcomes. For example, from an economic efficiency perspective, bankruptcy is more efficient as compared to bailouts.⁹² Such an analysis fails to consider systemic failures' socio-economic and political consequences.⁹³ For example, initiating Chapter 11 proceedings under the United States Bankruptcy law against Lehmann Brothers in 2008 led to widespread panic among investors causing runs on the money market and global financial contagion.⁹⁴ Humans run investment banks and other entities; therefore, it

⁸⁸ Jones and Samples (n 20).

⁸⁹ While the socio political aspect of systemic importance is necessary to understand the scope of systemic importance as a whole, it's relevance from the lens of insolvency is limited in nature.

⁹⁰ Levitin (n 45).

⁹¹ Schwarcz (n 64). See also Caruana (n 84); European Central Bank (ECB) (n 51).

⁹² Kenneth Ayotte and David Skeel, 'Bankruptcy or Bailouts?' [2009] 35 J. Corp. L. 469 <https://scholarship.law.upenn.edu/faculty_scholarship/259>.

⁹³ Levitin (n 45).

⁹⁴ Philip E Strahan, 'Too Big to Fail: Causes, Consequences, and Policy Responses' (2013) 5 Annual Review of Financial Economics 43.

cannot be assumed that they would always act rationally in a crisis.⁹⁵ Therefore systemic importance cannot be measured purely based on the macroeconomic risk posed by an entity but also must look at whether the average median voter would accept such a risk.⁹⁶ This is because lawmakers and regulators who resolve these crises are often overly responsive to citizens' concerns, even when they are irrelevant due to their political sensitivity.⁹⁷ Governments require political stability and trust from the people who they govern⁹⁸ to be able to effectively impose multiple measures over a span of time to stabilize the financial system. Therefore, a determination of an entity's systemic importance is a combination of the likely macroeconomic contagion caused by its failure and the willingness of the public to accept such a failure. Even if the macroeconomic contagion is not considered extremely widespread, if the general public deems such a contagion unacceptable, it could cause a run on the system and cause it to fail.⁹⁹

Importantly, it must be kept in mind while the socio-economic and political dimensions of systemic risk are relevant, an insolvency resolution framework would largely look at systemic risk from a financial dimension and its impact on the stability of the domestic and global economy. A good example is the shift in thresholds for granting government assistance in the 80s and 90s. As explained in the introduction, the prevalent test in the 80s was the community standard test/essentiality doctrine.¹⁰⁰ This was applied in the case of Banks such as the Commonwealth Bank, which accounted for only 0.1% of the GDP but was bailed out by the FDIC¹⁰¹ due to its essentiality to the black community for banking.¹⁰² In the 90s, enacting the FIDCI Act replaced the essentiality doctrine with a test of systemic risk and low-cost resolution.¹⁰³ Therefore it can be seen that systemic risk, when viewed from the lens of insolvency resolution provisions of laws such as the FIDCI Act, has moved away from socio-political issues to look more broadly at the risk posed to the financial system at large.

⁹⁵ Daniel Kahneman and Amos Tversky, 'Prospect Theory: An Analysis of Decision under Risk' (1979) 47 *Econometrica* 263.

⁹⁶ Levitin (n 45).

⁹⁷ Daniel Kahneman, *Thinking-Fast-and-Slow* <<http://dspace.vnbrims.org:13000/jspui/bitstream/123456789/2224/1/Daniel-Kahneman-Thinking-Fast-and-Slow-.pdf>> accessed 12 May 2023.

⁹⁸ Levitin (n 45).

⁹⁹ See generally, V Vaugirard, 'Financial instability, political crises and contagion' (2007) 73 *Recherches économiques de Louvain* 347.

¹⁰⁰ Nurisso and Prescott (n 31).

¹⁰¹ *ibid.*

¹⁰² 'Annual Report of the Federal Deposit Insurance Corporation' (FDIC 1972).

¹⁰³ Nurisso and Prescott (n 26), Section 141, Federal Deposit Insurance Corporation Improvement Act of 1991, 12 USC 1811.

Although systemic risk, when viewed from the lens of financial stability, does not deeply consider socio-political dimensions, some authors have begun to look at systemic risk more broadly by extending its scope beyond notions of financial stability. For example, Professor Jones argues that entities whose algorithms rely on hook mechanisms and control vast information ecosystems generate systemic risk in non-financial spheres such as democracy and free speech.¹⁰⁴ He illustrates this by referencing the impact of entities such as Twitter in influencing the Capitol Riots in 2020 in Washington, DC.¹⁰⁵ However, based on size and reach, Twitter would not be deemed systemically important under proposed legislation such as the European Union's *Digital Markets Act 2022*. Therefore, today it can be argued that all TBTF companies are systemically important, but not all systemically important companies are TBTF due to the expanded scope of Systemic Importance.

2.4 Types of Systemic Risk Regulations

A systemically important entity can only be dealt with by a combination of ex-ante and ex-post regulation.¹⁰⁶ Ex ante regulation includes regulating the size and scope of an entity through legislation, higher standards of liquidity in the case of financial and insurance companies, higher levels of monitoring and due diligence requirements (prudential regulations).¹⁰⁷ Ex Post regulation consists of fining entities for violating regulations, breaking up entities, and finally, insolvency resolution process for TBTF entities.¹⁰⁸ Insolvency resolution mechanisms aim to effectively resolve such entities and operate them as going concerns until the entity stabilizes and regulation moves to ex-ante. Therefore, insolvency laws dealing with systemically important institutions are the last defence in mitigating systemic risk.¹⁰⁹ An insolvency regime is effective only if it aids in preventing the contagion of systemic risk at a time of failure.

Currently, two categories of systemically important institutions are widely accepted. They are Systemically Important Financial Institutions (SIFIs) and Systemically Important Insurance Institutions (SIIs).¹¹⁰ Before examining whether Big Tech companies are systemically

¹⁰⁴ Jones and Samples (n 20).

¹⁰⁵ *ibid.*

¹⁰⁶ Alison M Hashmall, 'After the Fall: A New Framework to Regulate Too Big to Fail Non-Bank Financial Institutions Note' (2010) 85 *New York University Law Review* 829, 852.

¹⁰⁷ Kaufman (n 3).

¹⁰⁸ *ibid.*

¹⁰⁹ Levitin (n 26), 439.

¹¹⁰ 'Global Systemically Important Financial Institutions (G-SIFIs)' (9 December 2022)

<<https://www.fsb.org/work-of-the-fsb/market-and-institutional-resilience/global-systemically-important-financial-institutions-g-sifis/>> accessed 24 July 2023.

important, it is necessary to understand the metrics used to determine systemic importance in the financial and insurance sector and explore if Big Tech companies can be seen through the same lens.

3. Existing types of Systemically Important Institutions

Categorizing institutions as systemically important has largely revolved around large commercial banks and, more recently, Non-Banking Financial Companies (NBFC) and insurance companies.

Large commercial banks were the first to be considered TBTF mainly due to their size and interconnectedness.¹¹¹ Additionally, the economic model of banks being an asymmetric loss function¹¹² meant that profits were privatized while losses were socialized.¹¹³ Banks' reliance on public deposits implies that the burden of losses falls on depositors nationwide. This generates systemic risk, which poses a threat to financial stability. Further, Large banks' failure would lead to their inability to fulfil their role in the interbank market in ensuring liquidity for smaller banks.

Moreover, large banks that rely on economies of scale cannot be substituted with smaller banks,¹¹⁴ and the resultant liquidity crisis would lead to difficulty for most businesses to stay afloat.¹¹⁵ Lastly, the shift in asset holdings made the banking sector more concentrated.¹¹⁶ The concentration of assets in large banks exacerbated the risks of failure. Hence, large banks were considered systemically important,¹¹⁷ and consequently, TBTF frameworks evolved as traditional bankruptcy systems could not efficiently resolve them.¹¹⁸

In the aftermath of the 2008 global financial crisis, the scope of TBTF frameworks was widened and included NBFCs and Insurance companies. This was largely due to the failure of several US investment banks, such as Fannie Mae, Freddie Mac and Bear Stearns and insurers, such

¹¹¹ Moosa (n 43).

¹¹² *ibid.*

¹¹³ *ibid.*

¹¹⁴ Luc Laeven, Lev Ratnovski and Hui Tong, 'Bank Size and Systemic Risk' (International Monetary Fund).

¹¹⁵ Frederic S Mishkin, 'How Big a Problem Is Too Big to Fail? A Review of Gary Stern and Ron Feldman's Too Big to Fail: The Hazards of Bank Bailouts' (2006) 44 *Journal of Economic Literature* 988, 995.

¹¹⁶ In the 1980s, the top 10 banks held approximately 20% of total bank assets. By 2014 it had crossed 50%. See Nicola Cetorelli, James McAndrews and James Traina, 'Evolution in Bank Complexity' [2014] FRBNY Economic Policy Review.

¹¹⁷ Moosa (n 43); Robert L Hetzel, 'Too Big to Fail: Origins, Consequences, and Outlook' [1991] *Federal Reserve Bank of Richmond Economic Review*; R Charles Moyer and Robert E Lamy, "'Too Big to Fail': Rationale, Consequences, and Alternatives' (1992) 27 *Business Economics* 19.

¹¹⁸ Hetzel (n 117).

as AIG, and their subsequent bailouts. Globally and domestically, regulators understood that the crisis resulted from the interconnectedness of the financial transactions of NBFCs that were not well regulated. This led to the creation of two new types of systemically important entities: Systemically Important Financial Institutions (SIFI) and Systemically Important Insurers (SII). The scope of systemic importance within TBTF frameworks is fluid and adapts to developments in the financial markets.

3.1 Classification of SIFI's & SII's

Classifying large commercial banks or other financial institutions as systemically important is done at two levels. Firstly, international organizations such as the Financial Stability Board (FSB)¹¹⁹ categorize certain banks as globally important using a predetermined criterion. Secondly, domestic legislations of countries identify important banks and other financial institutions as systemically important. The standards/criterion to classify banks and financial institutions as systemically important could be examined to ascertain whether the same standards could determine systemically important technological institutions. For this purpose, the following sections look at the standards set by the FSB and domestic standards set in the USA, U.K., E.U. and India.

3.1.1 FSB Standards and Basel Framework

Globally, the Financial Stability Board (FSB) determines which financial institutions are systemically important. The FSB relies on the Basel Framework, the global standards of prudential regulation laid down by the Basel Committee on Banking Supervision (BCBS).¹²⁰ The framework categorizes banks into Globally Systemically Important Banks (G-SIBS) & Domestically Systemically Important Banks (D-SIBS).¹²¹ The FSB makes this determination annually and releases a list of G-SIBs yearly.¹²² The D-SIB's are to be determined by various countries at a domestic level either using the parameters set by the BCBS or their own set of parameters designed to suit the needs of the country.

¹¹⁹ The FSB is an international organisation that makes recommendations to various nations in order to promote and maintain global financial stability.

¹²⁰ 'Background to the Basel Framework' <<https://www.bis.org/baselframework/background.htm>> accessed 5 April 2023.

¹²¹ 'Evaluation of the Effects of Too-Big-To-Fail Reforms: Final Report' (Financial Stability Board), 15 <<https://www.fsb.org/wp-content/uploads/P010421-1.pdf>>.

¹²² 'Global Systemically Important Financial Institutions (G-SIFIs)' (9 December 2022) <<https://www.fsb.org/work-of-the-fsb/market-and-institutional-resilience/global-systemically-important-financial-institutions-g-sifis/>> accessed 5 April 2023.

The FSB identifies G-SIBS by using five broad parameters in the Basel Framework: size, interconnectedness, cross-Jurisdictional activity, substitutability and complexity.¹²³ These five parameters are divided into 12 sub-parameters.¹²⁴ Each of the five parameters is given an equal weightage of 20% in determining whether a bank is a G-SIB.

Similarly, to identify Global Systemically Important Insurers (G-SII), the FSB has since 2013, in consultation with the International Association of Insurance Supervisors (IAIS),¹²⁵ identified a list of G-SII. Initially, the methodology to determine the systemic importance of an insurer relied on five broad factors determined by the IAIS: size, global activity, interconnectedness, asset liquidation and substitutability.¹²⁶ Here, the size, global activity and substitutability have only a 5% weightage each in the determination of G-SII, while interconnectedness has a weight of 49.3% and asset liquidation has a weight of 35.9%.¹²⁷ The higher weightage towards interconnectedness and asset liquidation is because while the insurance sector in itself does not pose systemic risk, these two factors played a major role in the financial crisis that ensued in 2008.¹²⁸

Interconnectedness, as a factor, broadly looks at counterparty exposure and macroeconomic exposure.¹²⁹ Subsequently, from 2020 onwards, the FSB, in consultation with the IAIS, has decided to first suspend and in 2022 discontinue the annual identification of the G-SII's due to adopting the "Holistic framework for the assessment and mitigation of systemic risk in the global insurance sector". The Holistic framework involves a Global Monitoring Exercise consisting of sector-wide and individual insurer monitoring to identify any systemic and

¹²³ 'SCO40 - Global Systemically Important Banks' (313 2021)

<https://www.bis.org/basel_framework/index.htm> accessed 5 April 2023.

¹²⁴ The 12 sub-parameters are

1. Cross-jurisdictional activity – Cross-jurisdictional claims 10% Cross-jurisdictional liabilities 10%
2. Size - Total exposures as defined for use in the Basel III leverage ratio* 20%
3. Interconnectedness - Intra-financial system assets* 6.67% Intra-financial system liabilities* 6.67% Securities outstanding* 6.67%
4. Substitutability/financial institution infrastructure - Assets under custody 6.67% Payments activity 6.67% Underwritten transactions in debt and equity markets 3.33% Trading volume 3.33%
5. Complexity - Notional amount of OTC derivatives* 6.67% Level 3 assets* 6.67% Trading and available-for-sale securities 6.67%

¹²⁵ The IAIS is global standard setting institution for the supervision of insurance sector globally comprising of insurance supervisors of over 200 nations.

¹²⁶ 'Global Systemically Important Insurers: Updated Assessment Methodology' (International Association of Insurance Supervisors (IAIS) 2016) <<https://www.iaisweb.org/uploads/2022/01/160616-Updated-G-SII-Assessment-Methodology-New.pdf>> accessed 10 April 2023.

¹²⁷ Ibid.

¹²⁸ 'Global Systemically Important Insurers: Updated Assessment Methodology' (n 126); 'Global Systemically Important Insurers: Proposed Policy Measures' (IAIS 2012).

¹²⁹ 'Global Systemically Important Insurers: Updated Assessment Methodology' (n 126).

insurer-specific risks.¹³⁰ The Global Monitoring Exercise involves monitoring ten categories broadly without any specific weightage, namely:

1. Size;
2. Interconnectedness – Counterparty exposure;
3. Interconnectedness – Macroeconomic exposure;
4. Asset liquidation;
5. Substitutability;
6. Global activity;
7. Underwriting & Solvency;
8. Policyholder behaviour;
9. Emerging risks; and
10. Economic environment.¹³¹

The identification of G-SIB, D-SIB & G-SII aims to objectively identify those entities that are systemically important and limit the fallout from any failure of such institutions. While these standards are set globally, domestically, countries adopt these standards with modification based on domestic requirements. The following section looks at the standards for determining systemically important entities in a select few countries.

3.1.2 *United States of America*

The United States Congress, to prevent a financial crisis akin to that of 2008 recurring, enacted the *Dodd-Frank Act 2010*. One of the objectives of the Dodd-Frank Act was to establish special resolution mechanisms for certain financial entities. This special resolution mechanism was put in place through the establishment of the Orderly Liquidation Authority (OLA).¹³² A determination of systemic risk is to be made by the Board of Governors of the Federal Reserve and the Board of Directors of the Federal Deposit Insurance Corporation (FDIC). These two bodies determine the systemic risk of financial companies. The special resolution mechanisms under OLA may be used only if the Board of Governors of the Federal Reserve and the Board

¹³⁰ ‘Holistic Framework for Systemic Risk in the Insurance Sector’ (International Association of Insurance Supervisors 2023) <<https://www.iaisweb.org/uploads/2023/06/Global-Monitoring-Exercise-Document.pdf>> accessed 14 July 2023.

¹³¹ *ibid* at 11-13.

¹³² ‘A Primer on Dodd-Frank’s Orderly Liquidation Authority’ (*Brookings*) <<https://www.brookings.edu/articles/a-primer-on-dodd-franks-orderly-liquidation-authority/>> accessed 11 July 2023.

of Directors of the FDIC, by a 2/3rd vote, makes a written recommendation appointing the FDIC as a receiver of the failing entity.¹³³ The recommendation includes an evaluation of the impact of the failing entity on financial stability and why the Bankruptcy Code would not be appropriate to resolve the entity.¹³⁴ After receiving the recommendations, the United States Department of the Treasury (hereinafter “treasury”) must make its own determination after consulting the President.¹³⁵ The treasury must then seek consent from the Board of Directors of the financial company that is being sought to be acquired.¹³⁶ If the board does not acquiesce, the treasury must file a petition before the Federal District Court,¹³⁷ who determines if OLA may be applied to the entity within 24 hours after hearing the board and the treasury.¹³⁸

The term Financial Companies under the Code covers¹³⁹ –

1. Bank Holding Companies
2. Non-Banking Financial Companies (NBFC) supervised by the Federal Reserve
3. Companies engaging predominantly in activities that are deemed financial in nature by the Federal Reserve.
4. Any subsidiaries of the above three categories of companies that are predominantly engaged in activities deemed financial in nature by the Federal Reserve.

3.1.3 *United Kingdom*

The Banking Act 2009 of the UK provides a special resolution regime for banks,¹⁴⁰ building societies and certain investment firms along with their financial holding companies incorporated in the U.K.¹⁴¹ This legislation was enacted as a response to the financial crisis of 2008.

¹³³ 12 U.S. Code § 5383 - Systemic risk determination (a)(1)

¹³⁴ 12 U.S. Code § 5383 - Systemic risk determination (a)(2)

¹³⁵ 12 U.S. Code § 5383 - Systemic risk determination (b)

¹³⁶ 12 U.S. Code § 5382(a)(1)(A)(i) - Judicial review

¹³⁷ *ibid.*

¹³⁸ 12 U.S. Code § 5382(a)(1)(A)(iii) - Judicial review

¹³⁹ 12 U.S. Code § 5381(a)(11) - Definitions

¹⁴⁰ Similar to the USA, special resolution regimes refer to Insolvency proceedings that occur under the ambit of the Banking Act, 2009 as opposed to regular insolvency proceedings under the Insolvency Act, 1986.

¹⁴¹ ‘The Bank of England’s Approach to Resolution’ (Bank of England 2017)

<<https://www.bankofengland.co.uk/paper/2017/the-bank-of-england-approach-to-resolution>>.

The resolution of banks under the Act would take place only if two conditions are fulfilled. Firstly, the bank must be recognized as failing or likely to fail.¹⁴² An entity under this regime is considered as likely to fail if,¹⁴³

- a) The bank satisfies the threshold conditions for variation or cancellation of one or more of its regulated activities by the Prudential Regulatory Authority (PRA) or PRA under the Financial Services and Markets Act 2000.
- b) If the value of the assets of the bank is less or likely to be less than the liabilities.
- c) If the Bank is unable or unlikely to pay its liabilities when it is due.
- d) Extraordinary public financial support is required.

The PRA is to assume that the bank is likely to fail if the above conditions are met but for the assistance of the H.M. Treasury (HMT) or the Bank of England.¹⁴⁴

Secondly, there must not be any reasonable likelihood that some alternative action other than resolution would occur, leading to the entity no longer failing or being likely to fail.¹⁴⁵ The Bank of England assesses this in consultation with the PRA, Financial Conduct Authority (FCA) & HMT.¹⁴⁶

Once both conditions are fulfilled, the bank resolution must be proven to be in the public interest before the resolution tools can be applied to the failing bank. The Bank of England makes this determination in consultation with the PRA, FCA & HMT. A resolution of a bank is considered to be in the public interest when it fulfils any of the special resolution objectives listed under Section 4 of the Banking Act to a greater extent than other insolvency or winding up procedures under the Banking Act or elsewhere.¹⁴⁷ The objectives under Section 4 are¹⁴⁸ –

- a) Ensuring continuity of banking services and critical functions
- b) Ensuring financial stability and preventing market contagion
- c) Enhance public confidence in the financial and banking system
- d) Protecting public funds and minimizing the requirement for the use of financial support from such funds

¹⁴² Banking Act, 2009, c. 3, § 7(2) (Eng.).

¹⁴³ Banking Act, 2009, c. 3, § 7(5C) (Eng.).

¹⁴⁴ Banking Act, 2009, c. 3, § 7(5A) (Eng.).

¹⁴⁵ Banking Act, 2009, c. 3, § 7(5) (Eng.).

¹⁴⁶ Banking Act, 2009, c. 3, § 7(1) (Eng.).

¹⁴⁷ ‘The Bank of England’s Approach to Resolution’ (n 141).

¹⁴⁸ Banking Act, 2009, c. 3, § 4(3A)- (9) (Eng.).

- e) Protecting investors and depositors
- f) Protecting client assets of the distress firm
- g) Avoid interfering with property rights

These objectives are designed broadly and are not ranked in any order to allow the Bank of England flexibility to balance these objectives in the event of a conflict and target the necessary objectives based on the circumstances.¹⁴⁹

While the above two conditions are necessary to resolve banks, the Banking Act 2009 extended the same criterion to Investment firms.¹⁵⁰ Investment Firms that do not satisfy the public interest test but which hold clients' money are resolved through a special administration regime.¹⁵¹ This assessment is conducted by the PRA or Financial Conduct Authority (FCA) in the case of certain investment firms.¹⁵² Once a bank or investment firm covered under this act fulfils the said condition, it would become subject to the special resolution regime envisioned under the Act.

3.1.4 European Union

The EU in order to effectively resolve systemically important institutions, adopted the Bank Recovery and Resolution Directive (BRRD) in 2014. While several countries in the E.U. have their domestic insolvency regimes, one of the primary objectives of the BRRD was to enable a harmonized insolvency regime across the E.U.¹⁵³

This directive covers the institutions covered by the E.U. regulations on prudential requirements for credit institutions and investment firms.¹⁵⁴ This essentially covers credit institutions,¹⁵⁵ investment firms¹⁵⁶ and their subsidiary, which are financial institutions, as well

¹⁴⁹ 'The Bank of England's Approach to Resolution' (n 110), 13.

¹⁵⁰ Banking Act, 2009, c. 5 § 89A – Section 89A requires the provisions of Section 7 barring clause 7 to apply to Investment Firms as well. The Banking Act 2009 continues to rely on the definition of Investment Firms under EU regulations. See generally Article 1(2) of Regulation (EU) No 575/2013

¹⁵¹ 'The Bank of England's Approach to Resolution' (n 141).

¹⁵² *ibid.*

¹⁵³ Lintner Caroline, Irsalieva, Nurgul Pamela, Lincoln Nagy, Marie Anne Johanna, Pyziak, Piotr, Godwin, Andrew John, Schroeder, Susan, 'Understanding Bank Recovery and Resolution in the EU : A Guidebook to the BRRD' (*World Bank*) <<https://documents.worldbank.org/en/publication/documents-reports/documentdetail/100781485375368909/Understanding-bank-recovery-and-resolution-in-the-EU-a-guidebook-to-the-BRRD>> accessed 10 April 2023.

¹⁵⁴ Council Regulation No 575/2013, Art. 2, 2013 O.J (L 176)1, 18 (EU)

¹⁵⁵ Caroline, Irsalieva, Nurgul (n 153).

¹⁵⁶ An Investment firm' means any legal person whose regular occupation or business is the provision of one or more investment services to third parties and/or the performance of one or more investment activities on a professional basis. Art. 4(1)(1), Directive 2014/65/EU of the European Parliament and of the Council Directive

as financial holding companies or mixed activity holding companies¹⁵⁷ that are supervised on a consolidated basis. Under this only those investment firms with an initial capital outlay of more than 7,30,000 Euros are covered under the scope of this directive.¹⁵⁸ The harmonized classification system aids in ensuring speedy resolution in the event of bank failures.¹⁵⁹

3.1.5 India

In light of global efforts to classify banks as systemically important, the Reserve Bank of India (RBI) has listed a criterion for Domestically Systemic Banks. The methodology used by the RBI in determining Domestic Systemically Important Banks (D-SIB) is largely based on the criterion laid down for G-SIBs by the Basel Committee on Banking Supervision (BCBS) framework. The RBI's criterion consists of size, interconnectedness, lack of readily available substitutes or financial institution infrastructure, and complexity.¹⁶⁰ Unlike the BCBS framework, which provides equal weightage to all factors, the RBI has provided a 40 % weightage to the Size factor and 20% weightage to each of the other three factors.¹⁶¹ The justification given by the RBI is that the larger the size of the bank, the larger the impact on the financial system and the domestic economy in the event of its failure. Further, the cross-jurisdictional activity has not been considered in determining D-SIBs.¹⁶² While the measurement is to identify only domestically, it is generally understood that if a bank has a higher global reach, the resolution of such an entity becomes more difficult with parties in different jurisdictions, and it further exacerbates the spillover effects in the event of failure of such a bank or entity.¹⁶³

The Ministry of Corporate Affairs (MCA) identifies a slightly modified resolution regime for Financial Service Providers (FSP). The MCA defines an FSP as a Non-Banking Financial Company with a net asset size equal to or greater than Rs 500 Crore per the previous audited balance sheet.¹⁶⁴

2014/65/EU of the European Parliament and of the Council of 15 May 2014 on Markets in Financial Instruments and Amending Directive 2002/92/EC and Directive 2011/61/EU.

¹⁵⁷ Caroline, Irsaliev, Nurgul (n 153).

¹⁵⁸ Council Directive No 2013/36, Art. 28(2), 2013 O.J (L 176)338, 360 (EU)(As amended in 2019)

¹⁵⁹ Caroline, Irsaliev, Nurgul (n 153).

¹⁶⁰ Reserve Bank of India, Framework for Dealing with Domestic Systemically Important Banks (D-SIBs), (Issued on July 22, 2014). 6

¹⁶¹ *ibid* at 7.

¹⁶² *ibid* at 7.

¹⁶³ 'SCO40 - Global Systemically Important Banks' (n 79); BIS, 'Global Systemically Important Banks: Revised Assessment Methodology and the Higher Loss Absorbency Requirement' 10.

¹⁶⁴ Ministry of Corporate Affairs, S.O. 4139(E) (Notified on November 18, 2019) (Ind)

The insurance regulator – The Insurance Regulatory and Development Authority of India (IRDAI), has identified Domestic –Systemically Important Insurers (D-SII) based on the size of operations, value of assets, cross-jurisdictional activities, substitutability, interconnectedness and exposure.¹⁶⁵ The IRDAI, unlike the RBI, has considered cross-jurisdictional activity to identify D-SIIs. The Indian regime has, therefore, largely incorporated the BCBS framework in identifying systemically important institutions with certain modifications.

Overall, countries categorise systemically important financial and insurance companies using different methods. The question now lies as to whether any of the standards used domestically could be applied to technological institutions to identify SITIs or if the factors for their determination are distinct from those used for financial and insurance companies.

4. Systemically Important Technological Institutions (SITI)

SITIs refer to any technological institution that poses a systemic risk to the larger financial system and the global economy.¹⁶⁶ We adopt the same definition for this study. We examine how to identify SITI's and whether the factors and metrics used for financial companies may also be applied to SITIs. First, we explore what constitutes a technology institution.

4.1 What are Technological Institutions

The term technological company/institution has not been well defined in any codes or judgments.¹⁶⁷ The advent of Information and Communication Technology (ICT) and its benefits in respect of productivity, reduction of costs and economies of scale has led to ICT being incorporated within almost all spheres of business and throughout the economy in most countries.¹⁶⁸ Therefore, a definition of a technological institution has to go beyond the mere integration of ICT within the entity's core business. There have been some attempts recently to develop a definition of a technological institution. One such instance is in the 2017 report by

¹⁶⁵ Insurance Regulatory and Development Authority of India, Domestic Systemically Important Insurers (D-SIIs), (Press Release on September 25, 2021). 2

¹⁶⁶ Öhman and Aggarwal (n 7).

¹⁶⁷ While a number of indices such as the NASDAQ and S&P have defined the Technology Sector, it is an extremely broad definition that is much wider than the DMA as it includes industries such as the semi-conductor industry, hardware storage etc. See also, Louis Bellucci and Jodie Gunzberg, 'Sector Primer Series: Information Technology' [2019] S&P Dow Jones Indices.

¹⁶⁸ OECD, *Addressing the Tax Challenges of the Digital Economy, Action 1 - 2015 Final Report* (Organisation for Economic Co-operation and Development 2015), 52 <https://www.oecd-ilibrary.org/taxation/addressing-the-tax-challenges-of-the-digital-economy-action-1-2015-final-report_9789264241046-en> accessed 11 April 2023.

Tech Nation, an organization backed by the U.K. Government that aids tech company start-ups. They define Digital tech business as –

"A company that provides a digital technical service/product (including hardware and platforms) as its primary revenue source OR provides a product/service that is reliant on digital technology as its primary revenue source."¹⁶⁹

In the United States, the Illinois State Treasurers' Policy for the Illinois Growth and Innovation Fund, defines a technology business as –

"A company that has as its principal function the providing of services, including computer, information transfer, communication, distribution, processing, administrative, laboratory, experimental, developmental, technical, or testing services, manufacture of goods or materials, the processing of goods or materials by physical or chemical change, computer related activities, robotics, biological or pharmaceutical industrial activity, or technology oriented or emerging industrial activity."¹⁷⁰

The definitions we have currently create an extremely broad metric for determining technological institution. For the study, it is proposed that a technological institution is one that conducts any of the core platform services as defined under the Digital Markets Act 2022 of the European Union (hereinafter “DMA”).¹⁷¹ It defines core platform services as -

- (a) online intermediation services;
- (b) online search engines;
- (c) online social networking services;
- (d) video-sharing platform services;
- (e) number-independent interpersonal communications services;
- (f) operating systems;
- (g) web browsers;

¹⁶⁹ ‘Tech Nation 2017 Annual Report’ (Tech City 2017) <https://technation.io/wp-content/uploads/2018/04/Tech_City_2017_report_full_web.pdf> accessed 11 April 2023.

¹⁷⁰ Rodrigo Garcia, ‘Illinois Growth and Innovation Fund Investment Policy’, Office of the Illinois State Treasurer (2016).

¹⁷¹ Digital Markets Act 2022, Art. 1(2), Regulation (EU) 2022/1925, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32022R1925>.

- (h) virtual assistants;
- (i) cloud computing services;
- (j) online advertising services, including any advertising networks, advertising exchanges and any other advertising intermediation services, provided by an undertaking that provides any of the core platform services listed in points (a) to (i);

The DMA classifies a subset of the above entities as gatekeepers¹⁷² under the act. The basis of such classification is discussed later in this section. The above-mentioned definition under the DMA is one that comprehensively defines the scope of activities that technological institutions conduct.

4.2 Systemic Risk Posed by Technological Companies

Technological Institutions come in varying forms with some providing critical and essential services while others assist in providing ancillary services. Therefore, it is necessary to examine whether technological institutions may cause any of the three forms of systemic risk discussed earlier: Counterparty Contagion, Information Contagion, and Common Shock and as a result be deemed as systemically important.

Firstly, under counterparty contagion, the question is whether the failure of any technological institutions would lead to related parties or counterparties falling and causing a domino effect.¹⁷³ Since several technological institutions have become so large and interconnected, we have not seen a sudden or inorganic failure of technological institutions. Therefore, the study takes assistance from instances where technological institutions face downtimes.¹⁷⁴ Studies suggest an outage in 2021 that had taken place in Meta, which led to Facebook, WhatsApp & Instagram being down for a mere 5 hours, led to losses to the tune of 160 Million Dollars to the global economy.¹⁷⁵ This was partly due to the loss of advertising revenue estimated to be

¹⁷² *ibid*, Art. 3.

¹⁷³ It is important to note that the paper looks at sudden failure of these services and not a gradual organic failure of any company. Large Tech Companies like Nokia in Finland and Vodafone in India have failed but it was due to other companies slowly taking over their market share over time. Interestingly, in India, while Vodafone was not bailed out, the government converted its dues into equity in the company.

¹⁷⁴ Downtime refers to a period when the services offered by a Technological Company cannot be used by its customers due to technical issues.

¹⁷⁵ 'Facebook Costliest Outage Caused \$160 Million Loss: NetBlocks' (*Hindustan Times*, 5 October 2021) <<https://www.hindustantimes.com/business/facebook-costliest-outage-caused-160-million-loss-netblocks-101633418413175.html>> accessed 12 April 2023.

around 65 Million Dollars.¹⁷⁶ The other reason was due to the contagion effect. While announcing their Q4 results in 2021, Facebook noted that over 200 million businesses had accounts with Facebook and used the free tools of Facebook marketplace to conduct their business.¹⁷⁷ As a result of the outage at Meta, several small businesses that heavily rely on Facebook marketplace suffered substantial losses.¹⁷⁸ Apart from this, Facebook also noted that non-profits raised nearly 1.8 Billion Dollars through the platform for charity purposes.¹⁷⁹ A failure of an entity such as Meta would disrupt many small businesses, non-profits and an extremely vital communication platform that is globally relied upon. Earlier, in 2017, an outage in Amazon Web Services (AWS) for four hours led to a loss of over 150 Million Dollars to the companies listed on the S&P 500.¹⁸⁰ The counterparty contagion seen in the case of operational disruptions in the examples above would likely be multitudes higher in the event of a financial failure of the entity and likely cause severe macroeconomic contagion.¹⁸¹

Secondly, Big Techs entry into financial services creates an opportunity for information contagion. While entry into the financial system by Big Techs can take place independently, it substantially takes place through partnerships with financial institutions.¹⁸² The risks posed reputational contagion wherein the failure of a technological institution may lead to reputational risks faced by its partner financial institution.¹⁸³ These reputational risks could potentially lead to runs happening on such financial institutions.

Big Tech's entry into financial services has begun through payment services.¹⁸⁴ This leads to operational risk, i.e., freezing the provision of financial services.¹⁸⁵ Consider China, where Alipay and Tenpay account for 91% of the mobile payment market's market share, constituting

¹⁷⁶ Abram Brown, 'Facebook Lost About \$65 Million During Hours-Long Outage' (*Forbes*) <<https://www.forbes.com/sites/abrambrown/2021/10/05/facebook-outage-lost-revenue/>> accessed 12 April 2023.

¹⁷⁷ Mark Zuckerberg, 'Facebook 2020 Q4 Results Conference Call' (Zoom, 2021) <https://s21.q4cdn.com/399680738/files/doc_financials/2020/q4/FB-Q4-2020-Conference-Call-Transcript.pdf> accessed 12 April 2023.

¹⁷⁸ 'After Massive Outage, Small-Business Owners Lament — and Reconsider — Dependence on Facebook' (*NBC News*, 5 October 2021) <<https://www.nbcnews.com/business/business-news/after-hours-long-outage-small-business-owners-lament-reconsider-dependence-n1280838>> accessed 12 April 2023.

¹⁷⁹ Zuckerberg (n 177).

¹⁸⁰ Laura Stevens, 'Amazon Finds the Cause of Its AWS Outage: A Typo' *Wall Street Journal* (2 March 2017) <<https://www.wsj.com/articles/amazon-finds-the-cause-of-its-aws-outage-a-typo-1488490506>> accessed 12 April 2023.

¹⁸¹ 'BigTech in Finance: Market Developments and Potential Financial Stability Implications' (n 22).

¹⁸² Bains (n 11).

¹⁸³ Juan Carlos Crisanto and others, 'Big Tech Interdependencies – a Key Policy Blind Spot' (Bank for International Settlements).

¹⁸⁴ *ibid.*

¹⁸⁵ Bains (n 22), 20.

more than half of all non-cash retail payments in China.¹⁸⁶ A failure of either of these providers would lead to serious operational difficulties in the entire retail sector that could have spillover effects.

Third and finally, the collapse of a Big Tech entity could very well cause a common shock that would affect the rest of the economy. A good example of a common shock can be seen due to the failure of a cloud computing service or the cyber-attacks on cloud computing systems. A survey by the Bank of England in 2020 of the 30 largest banks and the 27 largest insurers showed that 70 % of Banks and 80% of insurers were using Infrastructure-as-a-Service from the top two cloud computing providers.¹⁸⁷ Furthermore, globally, the top 2 providers (Amazon Web Services & Microsoft Azure) accounted for 54 % of the market share in cloud computing, and the top 4 (Amazon Web Services, Microsoft Azure, Google Cloud & Alibaba Cloud) accounted for 70%.¹⁸⁸ This creates a concentration in the market for cloud computing which acts as the backbone of the digital economy. This leads to two problems. Firstly, it creates a potential antitrust problem due to its possible abuse of dominance and certain potential restrictive practices.¹⁸⁹ Secondly, its size and lack of easy substitutability generate systemic risk.¹⁹⁰ The failure of any of the top 4 cloud computing companies or a cyber attack on any of these platforms could lead to severe consequences for the banking industry, which is highly reliant on these platforms for daily functioning.¹⁹¹ The IMF, in a note on Big Tech in Financial Services, noted that the effect might go beyond banks:

"The failure of a service or one of these firms could create a significant event in financial services with poor outcomes for markets, consumers, and financial stability. Cloud services are also provided to non-financial sector firms, and in these sectors the provision of cloud is also deeply

¹⁸⁶ 'Do Alipay and Tenpay Misuse Their Market Power?' *The Economist* <<https://www.economist.com/finance-and-economics/2020/08/06/do-alipay-and-tenpay-misuse-their-market-power>> accessed 12 April 2023.

¹⁸⁷ 'How Reliant Are Banks and Insurers on Cloud Outsourcing?' (27 February 2023) <<https://www.bankofengland.co.uk/bank-overground/2020/how-reliant-are-banks-and-insurers-on-cloud-outsourcing>> accessed 28 February 2023.

¹⁸⁸ 'Infographic: Amazon, Microsoft & Google Dominate Cloud Market' (*Statista Infographics*, 23 December 2022) <<https://www.statista.com/chart/18819/worldwide-market-share-of-leading-cloud-infrastructure-service-providers>> accessed 13 April 2023.

¹⁸⁹ The UK in April 2023, initiated a probe into AWS and Microsoft over alleged anti competitive practices and highlighted that their size and certain contractual provisions may constitute restrictive trade practices. Reuters, 'Amazon and Microsoft Cloud Services Face UK Antitrust Probe' *Reuters* (6 April 2023) <<https://www.reuters.com/technology/uk-cloud-market-needs-competition-probe-ofcom-2023-04-05/>> accessed 6 June 2023.

¹⁹⁰ Crisanto and others (n 183).

¹⁹¹ Nicholas Fearn, 'Cloud Computing Dependence Imperils Banks' *Financial Times* (9 November 2022) <<https://www.ft.com/content/bd0c82b0-994c-40d0-87a8-090028964594>> accessed 13 April 2023.

concentrated. Operational disruption of large cloud service providers **could have material contagion impacts** not only to the financial sector but also to the wider economy."¹⁹²

A failure in a cloud computing service that causes operational disruptions even for a few days, could therefore pose severe contagion in the economy's financial and non-financial sectors. The failures of cloud computing could be largely limited through business continuity plans and by cloud computing services providers working on increasing interoperability. Further, while several banks and large institutions are looking to use a multi-cloud strategy to militate against this risk,¹⁹³ smaller businesses would be unable to do the same due to cost and complexity. The technology in data transfer across cloud platforms is still growing and is incomplete.¹⁹⁴ This, along with the fact that gaining expertise over multiple cloud platforms would require an expansion in these companies' human resources capacity, makes shifting platforms easier said than done.¹⁹⁵

The first dimension of systemic risk, which is composed of contagion and macroeconomic shock, would very likely occur if any of these Big Tech companies fail in a manner that causes operational disruptions to the services provided. While the examples referred to above are those caused by operational issues and not financial issues, these operational disruptions may occur even due to financial distress/failure of these companies. This means that certain Big Tech companies today are systemically important. The next sub-section details the second dimension of systemic risk vis-à-vis the procyclicality of systemic risk that is building up in the technology sector.

4.3 Other risks posed by SITI's

Apart from the risks of contagion and systemic shocks posed by Big Techs, they also pose two other major risks. Firstly, their easy access to funding creates a moral hazard problem that risks financial stability. Secondly, the degree of interconnectedness with the rest of the financial system and their entry into financial services exacerbates existing risks to financial stability posed by them.

¹⁹² Bains (n 11).

¹⁹³ 'How Reliant Are Banks and Insurers on Cloud Outsourcing?' (n 187).

¹⁹⁴ Financial Industry Regulatory Authority, 'Cloud Computing in the Securities Industry' (2021) <<https://www.finra.org/rules-guidance/key-topics/fintech/report/cloud-computing>> accessed 9 May 2023.

¹⁹⁵ *ibid.*

4.3.1 Moral Hazard Risks of SITI's

The first risk posed by SITIs arises as a consequence of their easy access to funding¹⁹⁶ and the moral hazard problem associated with the same. The expectation of financial firms once it becomes TBTF is often that in the event of a crisis, it would be bailed out by the government and therefore has an inbuilt safety net in all of its operations.¹⁹⁷ The bailouts, while beneficial to the depositors, create a moral hazard issue due to which firms that are TBTF apply riskier strategies without properly calculating the risk's cost.¹⁹⁸ The moral hazard associated with financial entities that are TBTF may be associated with SITI's today. The belief of SITI's in bailouts would encourage them to engage in more risky behaviour for higher returns and profits.¹⁹⁹ Professor Mishkin explains this by stating, "Financial institutions have been given the following bet: Heads I win, tails the taxpayer loses."²⁰⁰

Today Big Tech companies largely appear to have been dealt with the same bet that Professor Mishkin attributed to financial institutions, i.e., privatization of profits and socialization of losses. Big Tech companies today have a competitive edge in securing financing over other entities at lower rates.²⁰¹ One of the reasons for this competitive advantage is the possible expectation from bondholders of Big Tech that should any of these entities fail, the government would rescue them.²⁰² This has led to bondholders not accurately pricing the risk associated with such companies and providing easy access to funding with low-interest rates that are not commensurate to the risk posed.²⁰³ This also exacerbates the risk of moral hazard and encourages risky spending and investments by SITIs.²⁰⁴ A lack of risk assessment by bond holders would likely allow SITI's to operate in riskier areas to increase profitability.

One of the benefits of establishing a special insolvency regime for SITI's would be that it would lead bondholders to more accurately measure risk while issuing Bonds to SITIs as they would

¹⁹⁶ Abidi and Miquel-Flores (n 21).

¹⁹⁷ Frederic S Mishkin, *The Economics of Money, Banking and Financial Markets* (4th edn, Pearson Canada Inc 2011), 228

<http://bibliotheque.pssfp.net/livres/THE_ECONOMICS_OF_MONEYS_BAMKING_AND_FINANCIAL_MARKETS.pdf> accessed 15 April 2023.

¹⁹⁸ *ibid.*

¹⁹⁹ Abidi and Miquel-Flores (n 21).

²⁰⁰ Mishkin (n 197).

²⁰¹ Abidi and Miquel-Flores (n 21).

²⁰² *ibid.*

²⁰³ *ibid.*

²⁰⁴ See generally Thomas Barnebeck Andersen and Peter Sandholt Jensen, 'Too Big to Fail and Moral Hazard: Evidence from an Epoch of Unregulated Commercial Banking' (2022) 70 IMF Economic Review 808.

know that their bonds would not be rescued if a SITI fails.²⁰⁵ The presence of an special insolvency regime does not negate the possibility of a bailout, but reduces it's expectation which in turn limits moral hazard.²⁰⁶ The current lending model enhances the risk posed by SITIs and ties into the procyclicality dimension of systemic risk detailed in Part 2.2 of this paper. The complacency in risk measurement itself becomes an endogenous source of systemic risk.

An optimal insolvency system would be one wherein the collapse of a Big Tech entity would not lead to contagion in the rest of the market.²⁰⁷ Therefore, a standard classification of SITI's along with a robust insolvency framework is required to tackle the moral hazard risks SITIs pose.

4.3.2 *Interconnectedness of SITI's.*

The second risk posed is the interconnectedness of Big Tech with the rest of the global economy. While this interconnectedness would cause counterparty contagion, as discussed earlier, the growing interconnectedness between the financial and technology sectors and the entry of technological entities into the financial sector poses an unprecedented threat to financial stability.²⁰⁸ The risks posed by their interconnectedness are twofold.

Firstly, we have seen that most Big Tech companies enter into partnership arrangements with financial institutions.²⁰⁹ This provides these companies with a competitive advantage; IMF describes this as –

"Big Techs leverage their large user base to deliver consumer lending to individuals who might be underserved or excluded, with the potential effect of improving financial inclusion. Big Techs can reduce their risk exposure by delivering loans in conjunction with a commercial bank and by providing only the consumer interface."²¹⁰

²⁰⁵ See generally 'The Need for Special Resolution Regimes for Financial Institutions—The Case of the European Union in: IMF Working Papers Volume 2009 Issue 200 (2009)' <<https://www.elibrary.imf.org/view/journals/001/2009/200/article-A001-en.xml>> accessed 1 August 2023. to understand how special resolution frameworks help reduce moral hazard among financial institutions

²⁰⁶ FSB, 'Evaluation of the Effects of Too-Big-To-Fail Reforms: Final Report' (2021).

²⁰⁷ Abidi and Miquel-Flores (n 21).

²⁰⁸ Adrian and others (n 13).

²⁰⁹ Bains (n 11).

²¹⁰ *ibid.*

These partnership arrangements create the risk of moral hazard as the partnering commercial bank largely bears the risk of default on any of these loans. Some reports have shown that partner commercial banks bear 98% of the risk.²¹¹ This risk is further exacerbated by the fact that these loans given by Big Tech companies are usually without any collateral.²¹² For example, My Bank, a subsidiary of the Ali Baba group, has been lending money to MSMEs in China in collaboration with national commercial banks.²¹³ However, 98% of these loans were granted without any security. A recent Reserve Bank of India (RBI) report noted that the microloans issues by lenders associated with Big Techs in China were securitised and resold to investors including other banks.²¹⁴ Banks essentially used depositor money to purchase these loans and significantly transformed the nature of the risk involved.²¹⁵ The RBI noted that nature of the risk as follows-

“Innovative financial products by bigtechs can increase their interconnectedness with the banking system, with a possibility to transmit shocks and increase vulnerability during a crisis through new channels for the propagation of risks”²¹⁶

Similarly, in the U.S., Amazon provides unsecured loans to small businesses without any personal collateral.²¹⁷ In India, Google Pay is a facilitator and works with third-party lenders to disburse unsecured loans.²¹⁸ Scrutiny of these loans and the creditworthiness of the recipients to adjudicate risk by regulatory authorities are also absent²¹⁹

²¹¹ *ibid.*

²¹² Lei Liu, Guangli Lu and Wei Xiong, ‘The Big Tech Lending Model’ [2022] NBER Working Paper Series <https://www.nber.org/system/files/working_papers/w30160/w30160.pdf>.

²¹³ ‘Jack Ma’s Online Bank Is Leading a Quiet Revolution in Chinese Lending’ (*Fortune*) <<https://fortune.com/2019/07/29/jack-ma-mybank-lending/>> accessed 14 April 2023.

²¹⁴ Vijay Singh Shekhawat and others, “‘Bigtechs’ in the Financial Domain: Balancing Competition and Stability’ (2022) RBI Bulletin October 2022.

²¹⁵ *ibid.*

²¹⁶ *ibid.*

²¹⁷ ‘Amazon Lending’ <<https://sell.amazon.com/programs/amazon-lending>> accessed 24 July 2023; ‘Amazon Launches New Merchant Cash Advance Program Provided by Parafin, Doubling Down on Its Support for Small- and Medium-Sized Businesses’ (*Press Center*, 1 November 2022) <<https://press.aboutamazon.com/2022/11/amazon-launches-new-merchant-cash-advance-program-provided-by-parafin-doubling-down-on-its-support-for-small-and-medium-sized-businesses>> accessed 24 July 2023.

²¹⁸ ‘Google Pay Enables Online Loans for Small Businesses, Partners with Digital Lending App FlexiLoans’ (*Financial express*, 6 July 2021) <<https://www.financialexpress.com/industry/sme/msme-eodb-google-pay-enables-online-loans-for-small-businesses-partners-with-digital-lending-app-flexiloans/2284822/>> accessed 24 July 2023.

²¹⁹ Yuan Yang and Nian Liu, ‘Alibaba and Tencent Refuse to Hand Loans Data to Beijing’ *Financial Times* (19 September 2019) <<https://www.ft.com/content/93451b98-da12-11e9-8f9b-77216ebe1f17>> accessed 14 April 2023.

Secondly, Big Tech's entry into Money Market Funds (MMF)²²⁰ poses concerns. The model followed by Big Tech in this sector of the financial market has been explained by the Bank for International Settlements:

"On Big Tech payment platforms, customers often maintain a balance in their accounts. To put these funds to use, Big Techs offer money market funds (MMFs) as short-term investments. The MMF products offered are either managed by companies affiliated with the Big Tech firm or by third parties. By analyzing their customers' investment and withdrawal patterns, Big Techs can closely manage the MMFs' liquidity. This allows them to offer users the possibility to invest (and withdraw) their funds almost instantaneously"²²¹

When consumers deposit money with these MMFs, only 57% is invested in cash-like assets, while the rest is invested in bonds.²²² Given that MMF's investments are not as liquid as cash, a higher risk of a liquidity mismatch exists, particularly in times of stress/crisis.²²³

This exposure, along with the lack of any depositor insurance or safety net in the form of central bank liquidity requirements equivalents, leads to Big Tech causing more contagion in the event of distress or failure.²²⁴ The level of this exposure is likely to increase with the increased use of digital wallets globally.²²⁵ The potential failure of Big Tech companies poses serious systemic risks to the stability of the financial system. This risk is aggravated by the fact that some Big Tech companies are attempting to bypass prudential regulations. A good example is the partnership between Alipay and Yu'e Bao, both subsidiaries of the Alibaba group. The group decided to integrate Yu'e Bao's Money Market License with Alipay wallets, enabling Alipay users to invest in Money market Funds directly from their wallets, similar to how they could

²²⁰ Money Market funds are a type of mutual funds that invest in short term securities and are often used by investors as an alternative to store cash. 'Money Market Fund | Investor.Gov' <<https://www.investor.gov/introduction-investing/investing-basics/glossary/money-market-fund>> accessed 9 May 2023.

²²¹ 'BIS Annual Economic Report 2019, Ch III. Big Tech in Finance: Opportunities and Risks' (Bank for International Settlements 2019), 59.

²²² Gabriel Wildau, 'China Regulators Target "Systemic Risk" from Money-Market Funds' *Financial Times* (4 September 2017) <<https://www.ft.com/content/c145a75a-9136-11e7-a9e6-11d2f0ebb7f0>> accessed 12 May 2023.

²²³ Bains (n 11); Shekhawat and others (n 214).

²²⁴ Bains (n 11).

²²⁵ 'Digital Wallet Consumer Preferences: Trends and Statistics 2023 – Forbes Advisor' <<https://www.forbes.com/advisor/banking/digital-wallets-payment-apps/>> accessed 11 October 2023.

from their bank deposit account.²²⁶ The difference is that Alipay's wallet was not subject to the prudential regulations that a bank is subject to.²²⁷ The Chinese regulators have since attempted to contain the systemic risks arising from this through enhanced prudential regulation.²²⁸ While the Chinese regulations may not necessarily be substitutable in other regimes, the problems posed by Big Tech in China may repeat in other jurisdictions as Big Tech/SITIs continue to grow. Therefore, it would be prudent to examine these issues to proactively resolve them.

The entry of Big Tech/SITIs into the financial sector also requires a much larger discussion on the nature of regulations in this sphere. Other than in the banking and insurance sectors, all other financial services are regulated through an activity-based approach.²²⁹ Therefore, many of these entities avoid group-wide prudential regulations that prevent failure in the first instance. A good example of this can be seen in Amazon's Amazon Pay feature, which acts as a gateway service for financial transactions. It requires a money transmitter license for which certain norms are laid down.²³⁰ However, since it does not take deposits or offer insurance, it avoids entity-based regulation of the Amazon Group.²³¹ Therefore, it is necessary to either approach through a more entity-based approach or a hybrid approach towards regulating SITIs to limit systemic risk. Big Techs being systemically important, it becomes necessary to look at how to identify these institutions among all technological companies.

4.4 Standards for determining SITI's

The term Big Tech companies has loosely referred to the FAAMG companies (Facebook [presently Meta], Apple, Amazon, Microsoft & Google [Alphabet Inc]) and a few other domestically significant technological entities. To implement any entity-based regulatory framework, it is necessary to legislate standards by which SITIs may be determined, similar to the standards for SIFIs and SIIs.

²²⁶ Thammarak Moenjak and Veerathai Santiprabhob, 'Regulating Big Tech and Non-Bank Financial Services in the Digital Era' [2021] Central Banking.

²²⁷ *ibid.*

²²⁸ *ibid.*

²²⁹ Agustín Carstens and others, 'Regulating Big Techs in Finance' [2021] BIS Bulletin. See Claudio Borio, Stijn Claessens and Nikola Tarashev, 'Entity-Based vs Activity-Based Regulation: A Framework and Applications to Traditional Financial Firms and Big Techs'. Where Activity Based (AB) regulation is described as "AB regulation strengthens the resilience of a systemic activity directly, by imposing restrictions on how entities perform this activity alone, ie on a standalone basis. AB regulation does not vary with the type of entity that performs the activity or to the other activities that the entity performs."

²³⁰ Bains (n 11).

²³¹ *ibid.*

Reference can be made to the Digital Markets Act 2022 of the European Union, wherein a technological company was considered a gatekeeper²³² if it fulfilled three cumulative criteria –

- (a) It has a significant impact on the internal market of the E.U.;
- (b) It provides a core platform service²³³ which is an important gateway for business users to reach end users; and
- (c) It enjoys an entrenched and durable position, in its operations, or it is foreseeable that it will enjoy such a position in the near future.²³⁴

A significant impact on the internal market is considered to have been met if-

- a) The annual turnover of the entity in the E.U. exceeds 7.5 Billion Euros or if it has a market capitalization or fair market value of over 75 Billion Euros in the previous year, and;
- b) If the entity is operating core platforms services (CPS) in at least three member states.²³⁵

An entity providing CPS is considered an important gateway if it has at least 45 Million monthly active users and 10,000 active business users using the CPS.²³⁶ The entity is deemed entrenched and durable if it has met the active user thresholds for the previous three years.²³⁷

The EU is to release an official list of gatekeepers under the DMA in September 2023, after analyzing the data submitted to it by various companies. However, preliminarily, seven companies namely, Amazon, Apple, Google, Meta, Microsoft, Samsung and Byte Dance have stated that they meet the criterion to be classified as gatekeepers.²³⁸ Byte Dance the parent company of Tik Tok has contested whether it would be “an important gateway to for business users to reach end users” under Article 1(3)(b) of the DMA.²³⁹ Similarly, booking.com has projected that they would reach the criterion in the next financial year. The use of the same criterion as gatekeepers to identify SITI’s would therefore be problematic as a few companies

²³² The term gatekeeper has been used by the regulation as a designation of SITI’s. For more information read Article 2(1) r/w Article 3 of the Digital Markets Act, 2022. While the EU has not yet released an official list of gatekeepers, they plan on doing so by September 2023.

²³³ A core platform service refers to any of the services under Article 2(2) of the Digital Markets Act, 2022 and has been detailed in Part 3.3 of the present study.

²³⁴ Article 3.1 Digital Markets Act, 2022

²³⁵ Article 3.2 (a), Digital Markets Act, 2022

²³⁶ Article 3.2 (b), Digital Markets Act, 2022

²³⁷ Article 3.2 (c), Digital Markets Act, 2022

²³⁸ Foo Yun Chee, ‘U.S. Big Tech Says It Meets EU Gatekeeper Status, TikTok Criticises Label’ *Reuters* (5 July 2023) <<https://www.reuters.com/technology/amazon-google-apple-meta-microsoft-say-they-meet-eu-gatekeeper-status-2023-07-04/>> accessed 2 August 2023.

²³⁹ *ibid.*

such as Byte Dance or Booking.com are unlikely to have adverse effects on financial stability in the event of failure. Therefore, while identifying SITI's we may take aid from one of the factors used by the FSB to identify G-SIBs namely interconnectedness.²⁴⁰ While the FSB looks at interconnectedness of banks to other financial institutions, while identifying SITI's one must look at the interconnectedness with the financial system and the broader economy.

In India, the Parliamentary Standing Committee on Finance (2022-203) submitted a report on anti-competitive practices by Big Tech companies.²⁴¹ The Committee underscored the necessity to identify leading Big Tech players and categorize them as Systemically Important Digital Intermediaries (SIDI) to impose an ex-ante regulatory framework that would mitigate the anti-competitive practices of these entities.²⁴² The report suggested that SIDIs be identified using metrics such as market cap, revenue and the number of business and end users.²⁴³ This model is similar to what the E.U. has postulated under the Digital Markets Act 2022. The report, however, did not provide any concrete metrics as provided under the DMA, but must be seen as the first step taken by the Indian government towards regulating SIDI/SITIs. The lack of a concrete metric may be attributed to the fact that the regulatory process is still at a very nascent stage compared to the E.U.

Further, there exists research which supports the idea that the determination of SITIs must be limited to SITIs that provide certain CPS and cross-specific threshold limits in relation to the user base, visits per month and annual revenue.²⁴⁴ While these are similar to the metrics mentioned in the DMA, Professor Jones and Samples suggest the use of an additional metric, namely Impact Factors,²⁴⁵ which consist of:

- a) Concentration of power
- b) Extent of power
- c) Quasi-governmental functions
- d) Supra-sovereign status
- e) Control over the information ecosystem
- f) Effects on health

²⁴⁰ BIS (n 163).

²⁴¹ 'Anti Competitive Practices by Big Tech Companies' (Standing Committee on Finance 2022) 53rd Report<https://loksabhadocs.nic.in/lssccommittee/Finance/17_Finance_53.pdf>.

²⁴² *ibid.*

²⁴³ *ibid.*

²⁴⁴ Jones and Samples (n 20); Griffin (n 20).

²⁴⁵ Jones and Samples (n 20).

- g) Dis/misinformation
- h) Criminal activity
- i) Negative consequences of failure

Similarly, Professor Caleb Griffin proposes that to identify Systemically Important Platforms,²⁴⁶ it is necessary to consider whether the platform has a manipulative design. Professor Griffin argues –

"Likewise, indicators of reliance upon manipulative design might include use of known manipulative practices (such as behavioral "hook" mechanisms, autoplay, infinite scroll, loot boxes, or intrusive notifications), data revealing that a platform is primarily used by minors, young adults, and/or those particularly vulnerable to manipulative practices, and/or evidence that a significant portion of users of the platform exhibit symptoms of overuse or addiction. Examples of platforms that would likely meet these criteria at present include Facebook, YouTube, Instagram, Twitter, Snapchat, and TikTok."²⁴⁷

Using impact factors suggested by Professor Jones or manipulative design characteristics suggested by Professor Griffin may lead to the criterion for determining SITIs becoming too subjective. Some of these metrics, such as disinformation, would be viewed at different standards depending on the nature of governance of a country. Therefore, using metrics relying on manipulative design and other impact factors would open a Pandora's box of regulation based on socio-political considerations. Further, most of these factors, even when affected, would not affect the financial system's stability.

The question of what criterion is to be used while determining which entities are considered SITIs is ultimately the decision of domestic regimes. Presently, the technology industry does not have a global entity-based regulator analogous to the FSB in the banking sector. To effectively regulate such entities, global cooperation and information sharing among nations

²⁴⁶ Systemically Important platforms as defined by Professor Griffin is limited to digital platforms and not every technological institution. Further, the scope of systemic importance here goes beyond systemic importance to the financial system and looks at a slew of socio-political factors that are not very relevant to an insolvency framework.

²⁴⁷ Griffin (n 20).

are necessary to determine which SITIs are globally systemic, given the high degree of interconnectedness in international trade today.

5. Discussion

The emergence of SITIs as systemically important entities that are TBTF poses the question of whether the risks they pose are equivalent to that posed by SIFIs and SII's. Some authors argue that the risks posed by SITIs are similar to those posed by SIFIs and SIIs.²⁴⁸ The entry of Big Techs into the financial system,²⁴⁹ and their rapidly growing presence may lead to SITIs becoming a single point of failure in a globally interconnected ecosystem. Their failure could pose greater risks than that of an SIFI. This is because the risks posed by SITIs and SIFIs are not distinct/isolated, but the failure of the former may directly lead to the failure of the latter. This interconnectedness and spillover effect must be studied in detail. This requires global cooperation among financial and non-financial regulators to accurately detail the risks they pose and how to regulate them.²⁵⁰

A key point of discussion is whether an entity-wide regulator would have to be newly developed or if existing regulatory bodies can step up to regulate SITIs. Any entity-wide regulator of SITIs must be vested with resolution powers that enable them to ensure that the essential services of SITIs to dependent communities are uninterrupted.²⁵¹ Further, regulators must impose requirements on SITIs to develop recovery and resolution plans akin to those developed by SIFIs.²⁵² Another approach is to regulate SITIs similar to public utility services by imposing public obligations.²⁵³ However, such regulation must balance the freedom to trade and business and not be over-restrictive.

Further, SITIs provide several types of core platform services (CPS) across multiple jurisdictions; it may pose difficulties in classifying them correctly. Therefore, certain SITIs may argue that each CPS provided in each country is distinct as they operate on different

²⁴⁸ Jones and Samples (n 20).

²⁴⁹ Moenjak and Santiprabhob (n 226).

²⁵⁰ Agustín Carstens and others, 'Regulating Big Techs in Finance' [2021] Hyun Song, *Regulating big techs in finance* (August 2, 2021).

²⁵¹ Öhman and Aggarwal (n 7).

²⁵² *ibid.*

²⁵³ K Sabeel Rahman, 'The New Utilities: Private Power, Social Infrastructure, and the Revival of the Public Utility Concept' (*Cardozo Law Review*, 24 July 2018) <<https://cardozolawreview.com/the-new-utilities-private-power-social-infrastructure-and-the-revival-of-the-public-utility-concept/>> accessed 15 April 2023.

domain names even though the technical know-how is the same.²⁵⁴ If this argument succeeds, it will fall outside the threshold required to impose regulatory scrutiny. The scope of SITIs must be greatly more detailed by regulators to avoid this. Global regulators and information-sharing bodies are also necessary to measure the risks posed by SITIs accurately. Presently, the classification and regulation of SITIs is nascent, and any potential regulations require greater discussion among all stakeholders to be effective. Finally, regulators must also ensure that in their pursuit of regulating SITIs, they do not overregulate other technological companies and stifle innovation and growth.

6. Conclusion

The emergence of Big Tech conglomerates has created a new category of TBTF. The risks these entities pose in the event of failure could be comparable or even more than those posed by existing SIFIs and SIIIs. This is solely due to the degree of interconnectedness between these entities and Big Tech companies. The failure of a Big Tech company could have a cascading effect on SIFIs and SIIIs and therefore poses an even larger threat to the financial stability world over. In particular, the emergence of the Big Tech in the financial sector poses serious questions to the regulatory authorities and systems in place, which are largely activity-based regulation and not entity-based regulation. The current framework enables tech conglomerates to use different subsidiaries in various sectors and avoid regulatory scrutiny as to the risk posed by the entity's entire ecosystem. These Big Tech entities require deeper scrutiny from regulatory authorities worldwide through mandatory disclosures, antitrust regulation, emergency, and resolution planning under insolvency regimes etc. While there have been efforts by the E.U. and other nations towards trying to reign in the expansion of these Big Tech companies, the major focus has largely been on Anti Trust law. While hedging the global economy and financial stability, the last line of defence is insolvency law which helps TBTF entities avoid bailouts whilst minimizing the disruption to the global economy. The starting point may be for regulators to analyze whether insolvency frameworks set up to deal with SITIs and SII would lead to efficient outcomes when applied to the failures of SITIs.

²⁵⁴ ‘The Difficulty of Designating Gatekeepers under the EU Digital Markets Act’ (*Bruegel | The Brussels-based economic think tank*, 12 April 2023) <<https://www.bruegel.org/blog-post/difficulty-designating-gatekeepers-under-eu-digital-markets-act>> accessed 13 April 2023.