BANK LIQUIDITY CREATION UNDER BASEL NORMS: EVIDENCE FROM THE ASIA-PACIFIC REGION

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by

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Dedicated to my parents

For their endless love, support, and encouragement

CERTIFICATE

The thesis titled, **"Bank liquidity creation under Basel norms: Evidence from the Asia-Pacific Region"**, being submitted by **Ms. Juhi Gupta** to the Indian Institute of Technology Delhi, for the award of the degree of **Doctor of Philosophy** is a record of bonafide research work carried out by her. She has worked under my guidance and supervision and has fulfilled all the requirements for the submission of this thesis, which has attained the standard required for a Ph.D. degree at this institute. The results presented in this thesis have not been submitted elsewhere for the award of any degree or diploma.

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ABSTRACT

The social and economic costs associated with the global financial crisis (GFC) reinstated the interest of policymakers in improving the resilience and stability of banks. While the pre-crisis regulations predominantly dealt with bank capital, the crisis drove home the importance of regulating bank liquidity. During the crisis, liquidity shortages led to a fire sale of assets by solvent banks. Due to the contagion effect, the unexpected failure of banks spilled over to the financial systems and the economies at large. Notably, post-GFC, the Basel Committee on Banking Supervision (BCBS) introduced liquidity regulations under Basel III, which require banks to maintain sufficient liquidity buffers. Though the regulations aim at enabling banks to withstand potential liquidity shocks, they can unintendedly reduce the supply of loans and increase the cost of funds, consequently hampering the liquidity creation (LC) of banks.

Banks create liquidity by funding long-term illiquid assets with short-term liquid liabilities and providing off-balance sheet loan commitments and guarantees. By channelizing funds from savers to borrowers, LC promotes both consumption and supply of goods and services in the economy. Though LC is necessary for a well-functioning financial system and economic growth, it also exposes banks to liquidity crunches and bank runs (as evidenced by GFC). Therefore, it is crucial to understand bank LC under Basel norms as it has important implications for policymakers and bank regulators.

The study is motivated to explore different aspects of bank LC. First, it identifies the bank-specific, macroeconomic, and regulatory factors that drive bank LC. Second, it examines the nonlinearity in the bi-directional relationship between LC and bank capital and probes if bank size moderates this relationship. Third, it investigates the impact of LC on bank stability, with the moderating effect of environmental, social, and governance (ESG) disclosures. Finally, it also presents disaggregated analyses for (i) advanced economies (AEs) and emerging market

and developing economies (EMDEs), (ii) Basel II (2006-2012) and Basel III (2013-2019) periods, and (iii) small and large banks.

To achieve these objectives, the study employs data from commercial banks across fourteen Asia-Pacific economies during the period 2006 to 2019. The Asia-Pacific region has risen to the forefront of global economic growth and enjoys a well-developed financial structure with a dominant role played by the banking sector. The sample of the study comprises 597 commercial banks with 5857 bank-year observations. A two-step system generalized method of moments (GMM) estimator is employed to identify the determinants of bank LC as well as to investigate the impact of LC on bank stability. Further, a simultaneous equations model with a two-step system GMM estimator is used to examine the bi-directional relationship between LC and capital. The GMM estimator not only accounts for the dynamic nature of the panel data but also corrects for endogeneity, serial correlation, and heteroscedasticity.

The main findings of the study indicate that LC is primarily driven by bank capital, income diversification, asset quality, concentration in the banking industry, stock market development, financial access, and banking regulations. However, the disaggregated analyses reveal heterogeneity in the factors driving LC across sub-samples. The analysis of LC and bank capital indicates a non-linear bi-directional relationship between the two variables, with a significant moderating effect of bank size. The relationship is U-shaped in all samples except for EMDEs (where it is inverted U-shaped). Lastly, LC has a positive impact on the stability of banks, with the exception of large banks. ESG disclosure positively moderates the stability effects of LC.

Based on the findings, the study makes key recommendations to policymakers, bank regulators, bank managers, and other stakeholders. To the regulators, supervisory authorities, and policymakers, the findings of the study caution against formulating ‘one-size-fits-all’ or

uniform blanket regulations as they might not be effective in controlling the risks associated with LC and bank capital. Specifically, they should implement regulations that are modified according to the specific risk profiles of the banks as well as the institutional and structural environment of the countries. For instance, since LC can destabilize large banks due to moral hazard problems, there is a need to monitor these institutions closely and impose regulatory limits on their size. The findings also raise a cautionary flag regarding the liquidity-destroying effects of Basel III liquidity norms, as curbing LC might prove to be counterproductive in enhancing the stability of the banking system. Finally, the results call for coordination between liquidity and capital regulations, as these are complementary mechanisms.

Concerning the bank managers, the study provides them with a better understanding of the impact of various bank-specific factors on LC and macroeconomic and regulatory conditions that can alter LC, facilitating their decision-making process. The study also recommends that managers of small banks and banks in emerging economies use ESG disclosure to mitigate information asymmetry, enhance their reputation, and partially alleviate the uncertainty associated with lower institutional quality. Lastly, the study recommends that potential investors should have a better understanding of bank-level factors before deciding to invest in a bank.

सार

वैश्विक वित्तीय संकट (GFC) से जुड़ी सामाजिक और आर्थिक संकट ने नीति निर्माताओं का ध्यान बैंकों में स्थिरता और लचीलेपन (resilience) सुधार करने की ओर आकर्षित किया। इस संकट से पूर्व के नियम मुख्य रूप से बैंक पूंजी (capital) से संबंधित थे, परन्तु इस संकट ने चित्रित किया कि बैंक में तरलता (liquidity) को विनियमित करना महत्वपूर्ण है। संकट के दौरान तरलता की कमी के कारण पर्याप्त पूंजी वाले बैंकों को भी कम कीमतों पर संपत्ति की बिक्री करनी पड़ी। कॉन्टेजियन प्रभाव के कारण बैंकों की अप्रत्याशित विफलता वित्तीय प्रणालियों और अर्थव्यवस्थाओं में भी फैल गई। विशेषत: GFC के बाद बेसल कमेटी ऑन बैंकिंग सुपरविजन (BCBS) ने बेसल III के अंतरगत चलनिधि नियम स्थापित किये जिसके तहत बैंकों को पर्याप्त तरलता बफर बनाए रखने की आवश्यकता है। यद्यपि विनियमों का उद्देश्य बैंकों को संभावित तरलता के झटकों का सामना करने में सक्षम बनाना है, परंतु यह नियम अनपेक्षित रुप से बैंक ऋण की आपूर्ति को कम कर सकते हैं और कोष की लागत में वृद्धि कर सकते हैं, जिसके परिणामस्वरुप बैंकों की तरलता सृजन (LC) में बाधा उत्पन्न हो सकती है।

बैंक तरलता सृजन के अंतरगत दीर्घकालिक अल्पकालिक दायित्व का उपयोग करके अतरल संपत्तियों का वित्तपोषण करते हैं और ऑफ-बैलेंस शीट ऋण प्रतिबद्धता और गारंटी प्रदान करते हैं। LC बचतकर्ताओं से उधारकर्ताओं में धन अंतरण की सुविधा प्रदान करके अर्थव्यवस्था में वस्तुओं और सेवाओं की उपभोग और आपूर्ति दोनों को बढ़ावा देता है। यद्यपि LC एक सुसंचालित वित्तीय प्रणाली और आर्थिक विकास के लिए आवश्यक है, परंतु यह तरलता संकट और बैंक भगदड़ (GFC द्वारा प्रमाणित) उजागर करने की भी क्षमता रखता है। अतः बेसल मानदंडों के तहत बैंक LC के प्रभाव को समझना महत्वपूर्ण है क्योंकि इसका नीति निर्माताओं और बैंक नियामकों के लिए निर्णायक निहितार्थ है।

यह अध्ययन बैंक LC के विभिन्न पहलुओं का अन्वेषण करने के लिए प्रेरित है। सबसे पहले यह अध्ययन LC के बैंक-विशिष्ट, व्यापक आर्थिक और विनियामक और संस्थागत निर्धारकों की पहचान करता है। दूसरा, यह अध्ययन LC और बैंक पूंजी के बीच द्वि-दिशात्मक संबंध में गैर-रैखिकता का परीक्षण करता है और साथ में बैंक के आकार की इस संबंध में संयमित भूमिका का अनुसंधान करता है। तीसरा, यह अध्ययन बैंक की स्थिरता पर LC के प्रभाव का आकलन करता है और इस संबंध में पर्यावरण, सामाजिक, और शासन (ESG) प्रकटीकरण की संयमित भूमिका की जांच करता है। अंत में, यह (i) विकसित अर्थव्यवस्थाओं (AEs) और उभरते बाजार और विकासशील अर्थव्यवस्थाओं (EMDEs), (ii) बेसल II (2006-2012) और बेसल III (2013-2019), और (iii) छोटे और बड़े बैंक के लिए उप-विश्लेषण भी करता है।

उपरोक्त उद्देश्यों का आकलन करने के लिए यह अध्ययन 2006 से 2019 की अवधि के दौरान चौदह एशिया-प्रशांत (Asia-Pacific) अर्थव्यवस्थाओं में वाणिज्यिक बैंकों के डेटा का उपयोग करता है। एशिया-प्रशांत क्षेत्र वैश्विक आर्थिक विकास में प्रमुख स्थान प्राप्त कर चुका है और इसकी वित्तीय संरचना सुविकसित है जिसमें बैंकिंग क्षेत्र एक प्रभावशाली भूमिका निभा रहा है। इस अध्ययन के सैम्पल में 597 वाणिज्य-बैंक अथवा 5857 बैंक-वर्ष प्रेक्षण हैं। बैंक LC के निर्धारकों की पहचान करने एवं बैंक की स्थिरता पर LC के प्रभाव की जांच करने के लिए एक टू-स्टेप सिस्टम जनरलाइज्ड मेथड ऑफ मोमेंट्स (GMM) का उपयोग किया गया है। LC और बैंक पूंजी के बीच द्वि-दिशात्मक संबंध का अनुसंधान करने के लिए युगपत समीकरण मॉडल के साथ टू-स्टेप सिस्टम GMM अनुमानक का प्रयोग किया गया है। GMM एस्टीमेटर पैनल डेटा की गतिशील प्रकृति, अंतर्जातता, क्रमिक सहसंबंध, और विषमलैंगिकता को नियंत्रण करता है।

इस अध्ययन के मुख्य निष्कर्षों से पता चलता है कि LC प्राथमिक रूप से बैंक पूंजी, आय विविधीकरण, संपत्ति की गुणवत्ता, बैंकिंग उद्योग में संकेंद्रणता, शेयर बाजार के विकास, वित्तीय अभिगम, और बैंकिंग नियमों द्वारा संचालित होता है। यद्यपि उप-विश्लेषण के परिणाम LC के निर्धारकों में विषमता प्रकट करते हैं। LC और बैंक पूंजी का विश्लेषण द्वि-दिशात्मक संबंध में गैर-रैखिकता इंगित करता है, जिसमें बैंक आकार का एक महत्वपूर्ण संयमित प्रभाव है। इस विश्लेषण में सभी नमूनों में यू-आकार (U-shaped) है, परन्तु EMDE में औंधा यू-आकार (inverted U-shaped) है। अंत में, परिणाम यह भी स्थापित करते हैं कि बड़े बैंकों के अतिरिक्त, LC का बैंकों की स्थिरता पर सकारात्मक प्रभाव पड़ता है। ESG स्कोर LC के स्थिरता प्रभावों को सकारात्मक रूप से संशोधित करते हैं ।

इन निष्कर्षों के आधार पर यह अध्ययन नीति निर्माताओं, बैंक नियामकों, बैंक प्रबंधकों और अन्य हितधारकों के लिए महत्वपूर्ण संस्तुति प्रदान करता है। यह शोध नियामकों, पर्यवेक्षी प्राधिकरणों और नीति निर्माताओं को 'वन-साइज़-फिट्स-ऑल' या एक समान विनियम तैयार करने के प्रति सावधान रहने का सुझाव देता है क्योंकि वे LC और बैंक पूंजी से जुड़े जोखिम को नियंत्रित करने में प्रभावी नहीं होते हैं। विशेषत: उन्हें उन विनियमों को लागू करना चाहिए जिन्हें बैंकों के विशिष्ट जोखिम प्रोफाइल के साथ-साथ देशों के संस्थागत और संरचनात्मक वातावरण के अनुसार संशोधित किया गया हो। उदाहरणार्थ, नैतिक खतरों की समस्याओं के कारण LC बड़े बैंकों को अस्थिर कर सकता है, इसलिए इन संस्थानों की जागरूकता से निगरानी करने और इनके आकार पर नियामक सीमाएं लगाने की आवश्यकता है। अध्ययन के निष्कर्ष बेसल III चलनिधि नियमों के तरलता विनाशकारी प्रभावों के बारे में भी चेतावनी देते हैं क्योंकि LC पर अंकुश लगाना बैंकिंग प्रणाली की स्थिरता को

बढ़ाने में प्रतिकूल साबित हो सकता है। अंत में, अध्ययन के परिणाम तरलता और पूंजी विनियमों के बीच समन्वय की मांग करते हैं क्योंकि ये संपूरक तंत्र हैं।

यह अध्ययन बैंक प्रबंधकों को LC पर विभिन्न बैंक-विशिष्ट कारकों, व्यापक आर्थिक और नियामक स्थितियों के प्रभाव की बेहतर समझ प्रदान करता है, जो उनके निर्णय लेने की प्रक्रिया सुविधाजनक बनाएगा। यह शोध छोटे बैंकों और उभरती अर्थव्यवस्थाओं में बैंकों के प्रबंधकों को सलाह देता है कि सूचना विषमता को कम करने के लिए , उनकी प्रतिष्ठा बढ़ाने के लिए, और खराब संस्थागत गुणवत्ता से जुड़ी अनिश्चितता को आंशिक रूप से कम करने के लिए ESG प्रकटीकरण का प्रयोग करना चाहिए। अंत में, यह अध्ययन संभावित निवेशकों को बैंक में निवेश करने का निर्णय लेने से पहले सूक्ष्म कारकों की बेहतर समझने की सलाह देता है।

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Abbreviations

AEs	Advanced economies
AR (2)	Arellano-Bond serial correlation test
ASF	Available stable funding
ATM	Automated teller machine
BCBS	Basel Committee on Banking Supervision
BIS	Bank for International Settlements
BRICS	Brazil, Russia, India, China, and South Africa
CAR	Capital adequacy ratio
CEO	Chief executive officer
C-I	Cost-to-income ratio
EIU	Economic Intelligence Unit®
EMDEs	Emerging markets and developing economies
EPU	Economic policy uncertainty
ESG	Environmental, Social, and Governance
FLC	Catfat liquidity creation
GCC	Gulf Cooperation Council
GDP	Gross domestic product
GFC	Global financial crisis
GMM	Generalized method of moments
HHI	Herfindahl-Hirschman Index
HLCH	High liquidity creation hypothesis
IMF	International Monetary Fund
IV	Instrument variable
LC	Liquidity creation
LCR	Liquidity coverage ratio
LLP	Loan loss provisions

LMI	Liquidity mismatch index
LSDV	Least square dummy variable
LSH	Liquidity shortage hypothesis
LT	Liquidity transformation
M&A	Mergers and acquisitions
MENA	Middle East and North Africa region
NFLC	Catnonfat liquidity creation
NPL	Non-performing loans
NSFR	Net stable funding ratio
OBS	Off-balance sheet
OLS	Ordinary least squares
PCA	Principal component analysis
ROA	Return on assets
RSF	Required stable funding
TBTF	Too big to fail
VIF	Variance inflation factor
WDI	World Development Indicators
WFH	Weak fundamental hypothesis
WUI	World uncertainty index
2SLS	Two-stage least squares estimator
3SLS	Three-stage least squares estimator