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**Research Paper**

# Basel III: Impact of implementation in developed and developing countries

**Bachelor Thesis**

**Geneva Business School**

**BBA International Management**

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**Geneva, Switzerland**

**Date: June/2021**

**Word count: 17,761**

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Date: June 2021

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## Acknowledgements

Thank you to all professors and bankers who supported me through my research period

## List of Abbreviations

| | |
|---|---|
| **GFC** | Global Financial Crisis |
| **VaR** | Value at Risk |
| **CaR** | Capital requirements |
| **BCBS** | Basel Committee on Banking Supervision |
| **EAD** | Exposure at Default |
| **ECAI** | External Credit Assessment Institution |
| **EU** | European Union |
| **G 13** | The member nations of the G13 (Belgium, Canada, France, Germany, Italy, Japan, Luxemburg, the Netherlands, Spain, Sweden, Switzerland, UK and the US). |
| **HQLA** | High Quality Liquid Assets |
| **ICAAB** | Internal Capital Adequacy Assessment Process |
| **CCB** | Capital Conservation Buffer |
| **LCR** | Liquidity Coverage Ratio |
| **LGD** | Loss Given Default |
| **LR** | Leverage Ratio |
| **NLO** | Net liquid outflows |
| **NSFR** | Net Stable Funding Ratio |
| **m** | Remaining maturity of the exposure (m) |
| **PD** | Probability of Default |
| **RSF** | Required Stable Funding |
| **RWA** | Risk-Weighted Assets |

**US** United States of America

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## Abstract

The banking industry carries a large responsibility not only for the clients, but for the whole financial system. The financial crisis over time has intensified the importance of the financial regulations to assure a stability for worlds economy. Deepening a knowledge in the measures made to tackle diverse risk of the market and from the bank itself, its essential for the construction of a robust and sustainable infrastructure. However, since the development of the Basel I, discussions about the tradeoff effect of the increment of a capital burden in the operations of banks compromises various other segments of the banks. The most recent enhancements of the Basel accords are currently implemented into the banking system. The expected repercussions of these implementations are the focus of the empirical investigation.

After a short description of bank concepts and the Basel guidelines, the literature review shows previous scientific investigations the effect of the implementation of Basel I and II regulations in banks around the world. Thus, this thesis investigated the spectrum of opinions amongst banking experts and tested my assumptions empirically, in cooperation with my supervisor Dr. Victor Yerris, the papers evidenced, Basel III could have a positive impact in the banking sector including finding from experts in developed and developing countries. Second, the analysis demonstrated safety levels were significantly improved, despite the main costs implied from its implementation. Finally, the research found the main concerns of the negative effect compromise costs of capital mobilization and lending, but still there is an appreciated improvement by the reduction of the default risk and risk management practices for better financing provisions and back-up of banks since then.

# 1 Introduction

## 1.1 Overview

Banks play a crucial role in the world's economy. First of all, they provide access to currencies and the payment systems. They generate liquidity and give investors the opportunity for risk diversification as well as providing services to support the economic growth. As financial intermediaries they are the main source of funding for the real economy. Consequently, their safety, trustworthiness and soundness are closely linked to the prosperity of the whole economy.

The Basel Regulations was a response to the high number of disruptions happening in the international financial markets justified by the cost effects for the financial institutions. The constant improvements by the Committee to were first introduced by the Basel I known as the minimum capital ratio, with the aim of reducing the potential losses of banks and for the enhancement of the safety perceived by the depositors and creditors of the banks.

Evolving over the time with Basel II which received critics absolutes its short approach towards the increasing financial innovation during the last years. The biggest financial crisis in 2008 would incentive to higher regulatory measures about liquidity and capital, therefore the BCBS launched the Basel III to make improvements by the strengthening of capital, a new approach to global liquidity standard, the risk coverage capacity of banks and the leverage ratio.Then banks have argued that despite there could be a notable improvement of the bank's stability levels, banks could encounter a set of negative implications.

Various studies reflect the theories about their impact of increment of capital. Nowadays, the impact they have in different segments of banks like lending, risk management, profitability, etc.

Against this background the heads of state and government of the G20 assigned the construction of an improved set of equity and liquidity regulations for banks to the Basel Committee on Banking Supervision. The formation and importance of the resulting reform package named, "Basel III: A global regulatory framework for more resilient banks and banking systems" and the expected consequences of this accord in the view of banking representatives are the subject of this work.

## 1.2 Research Aims and Objectives

The recent major talk in the banking sector regulation born from after the GFC, and the instauration of a set of stringent measures for bank worldwide might have repercussions in different sectors of the bank operations. Despite their regulatory is aimed to increase bank's ability to bear with risk, there is also some negative effects, then this research aims investigating, confirming or criticizing the average impact from the two sides of the balance effects (positive and negative) for the banks.

## 1.3 Research question

¿How has the implementation of Basel III impacted banks from developed and developing countries?

## 1.4 Sub research questions

**1.4.1** ¿How has Basel III implementation impacted stability?

**1.4.2** ¿How has Basel III implementation impacted capital and funding?

**1.4.3** ¿How has Basel III implementation impacted profitability?

**1.4.4** ¿How has Basel III implementation lending?

**1.4.5** ¿How has Basel III implementation impacted risk management?

**1.4.6** ¿How has Basel III implementation impacted the default risk?

## 1.5 Research Hypothesis testing

This research will test both the **Null (Ho)** and **Alternative Hypothesis (HA)** **t**o analyze the impact in developed countries, this are the following hypothesis

**H0:** **$\mu=0$** Basel III implementation have a positive impact in banks from developed and developing countries

HA: **$\mu \neq 0$** Basel III implementation have a negative impact in banks from developed and developing countries

By looking for specific evidence impacting stability, capital and funding, profitability, lending, risks management and default to test the hypothesis.

## 1.6 Thesis structure

Prior to my investigation, comprehensive research on the role of financial systems as integral part of advanced and complex economies has to be made. Thus, the first chapter begins with a brief overview of banks functions and types, to furtherly describe the macroeconomic role of banks in the financial system and risk encounter as part of their intermediation. This support the understanding of a vital role of regulations to prevent macroeconomic role of banks in the financial system.

The second part of the chapter introduces the Basel Committee on Banking Supervision and talks about the development from Basel I to Basel III measures in detail. Basel I, II and III measures will be explained and followed by the critics that encountered to their development along time, supporting the discovery whether have had sufficient instruments to effectively encounter a financial crisis. Finally, chapter from wide author's perspective indagates different theories of the impact of Basel III in banks.

The third chapter includes the empirical investigation supported by questionnaires and interviews to experts from banks in developed and developing countries about the impacts perceived within capital, stability, profitability, lending and risk management, and default to finally test the hypothesis: "Basel III impacted banks from developed and developing countries based on the data and information gathered.

Finally, I give an outcome of perspective of the impact of Basel III on the basis of our empirical study.

The thesis will be structured as here below indicated:

**Chapter 1** will be a general introduction of the research topic including an overview of the main research question.

**Chapter 2** will analyze the background of the banks, the development of Basel Accords explaining how their instruments work and finally repercussions on the banks' capital structure perceived in the last years according to some researchers worldwide with a special focus on lending, stability, profitability, lending , risk management and default.

**Chapter 3** is the research methodology covering the background, research questions and data collection analysis with the correspondent instruments are explained.

C**hapter 4** will highlight the findings of the questionnaire and the interviews

C**hapter 5** include conclusions and limitations of the research besides giving recommendations for further research.

## 1.7 Research setting

Most of the sample research taking part in Europe to a large extent in Switzerland and Spain and America, specifically in Ecuador and Peru.

## 1.8 Research supervisor

Supervised by Dr Victor Yerris, Professor of Banking and Finance at the Geneva Business School, Assistant Head of investments concepts, Citibank (Switzerland) AG, Zurich. Dr. Yerris, who is well acquainted with this topic and the right mentor in this research.

## 1.9 Research data collection and analysis

Data for this research will be collected through empirical surveys and literature readings on the Basel III subject and its impacts on banks

## 1.10 Research preliminary

This thesis research will start by giving a brief background of the banking sectors, macroeconomic concepts, followed by the evolution and critics of the Basel Accords as well as its implications in banks.

# 2 Literature Review: Macroeconomic Role and Regulation of Banks

## 2.1 Organizing the Financial Intermediation

### 2.1.1 Modern definition of banks

The institution of a banking system is essential in the stability and economic development in a constantly changing economies, then banks play a major role as intermediaries by converting liquid deposits into larger loans and productive investments. Thus, offering services in depositing and lending funds against the payment of fees[1]. Banks functions under on-balance sheet operations meaning deposits and off-balance sheet actions such as loan commitments, letter of credit, and other guarantees supporting potential investments, alternative external finance and hedging solutions in the risky market through securities (Menicucci & Paolucci, 2016). However, it is essential to state that commercial banks are totally different to the central banks covering different scopes and functions in the economy. Finally, its functions are not linear, they have evolved since their earliest traces in the world.

#### 2.1.1.1 Type of banks

Bank can be categorized as the following

1. *Retail Banking or Personal banking*: Are small scale services visible to the public, including operations like payment facilities, credit transfers, direct debits, standing orders), saving, loans, mortgages, insurance, pensions and other service. Compromises:

   1.1 *Commercial Banks:* Primarily focus on commercial loans and deposits, they are also involved in asset liability management practices like investment banking, insurance, and others.

   1.2 *Other institutions including saving banks, co-operative banks, building societies, credit unions and finance houses*

2. *Private Banking*: Concerned mainly to wealthy clients, offering retail solutions like payment and account facilities, and investment related activities. Its operations remains in a personal basis rather than a market retail approach[2].

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[1] see Muraleedharan, 2009, p. 55-63

[2] See Driga, Nita & Cucu, 2009, pag-231

3. *Investment Banks:* Operating as intermediaries of capital raising within individuals and institutional investor by the issuance of stock (equity) or debt(bonds). Focused mainly in financial advisory, usually on capital increment by mergers and acquisitions (M&As) and structured products. (Joshua Abor, 2003).

4. *Corporate banking:* Relates to the services to large companies. However, it also includes activities in the small and medium size firms like payment services, debt and private equity finance and special financing.

#### 2.1.1.2 Macroeconomic functions of banks

Banks are intermediaries in the modern economy, managing their operations from two streams, first receiving funds from savers, and maintaining those pool available for future demand of households of business in terms of credit, then transferring liquidity, being the three main functions:[3]

1. **The batch sized transformation:** Banks use the incremental amount of deposits from individual private households to bundle them into larger amounts of credit available in the way of loans to companies.[4]

2. **Transformation of maturities**: While savers remain flexible preferring short commitments for their capital, borrowers need long term loans to finance projects, then banks use the short-term deposits for the lifetime funding demand.

3. **Risk transformation:** Relevant in the Global Financial Crisis in 2008, the increased different risk for savers and investors obliged banks to check and rate the individual credit risk of borrowers, banks are specially concerned as they are liable with its equity towards the default of loans. With the aim of ensure that loan defaults do not immediately lead to bankruptcy of the bank or in the worst case the loss of savings deposits[5], Basel Accords develop norms so that a portion of each loan can be covered with equity.

[3] see Gabler Wirtschaftslexikon, 2000, p. 388-389
[4] see Gabler Wirtschaftslexikon, 2000, p. 388-389
[5] See Fabozzi et al, 2010 p.22

#### 2.1.1.3 Risks of financial intermediation

Previous experiences have demonstrated banks to be highly leveraged in nature. Moreover, financial turmoil since 1930s, have showed that there is a constant risk carried in all scale's levels of banks with various risk management practices to ensure its normal operations from deposits withdrawals, loan supply, and off-balance sheet. Furthermore, although there is a benchmark across continents in terms of size of banking sectors relative to their financial market size, all them are exposed to market, interest rate, credit, operational and liquidity risk (Berger, Molyneaux, & Wilson, 2012).

Liquidity is one of the main functions of the banking sector that provides loans and liquid funds, this task is not limited to their funding liquidity ability (cash raising), but also, maintaining acceptable levels to trade in the market with low asset risk (Li, Loutskina, & Strahan, 2019). Finally, banks remain a relevant actor of study in the financial market due to its significant intermediation feature with governments through access to guarantee deposits and liquid loans from central banks. Currently, banks are with innovative environment of bank products, to capture higher diversified revenue streams against threats from a systematic financial system. Thus, the control of this parameters is subject not only to internal models of banks but also to measurements of the regulatory institutions.

## 2.2 Banking crisis and 2008 Global Financial Crisis

Denominated the Subprime crisis, the most severe of banking crisis in the recent years after the Great Depression of 1930s denoting how challenging was to protect bank's capital. Born by the lax lending standards and low-cost credit access enhanced the housing bubble. The domino effect was based on the collapse of one of the largest banks of the US , the Lehman Brothers , and its interconnection to counterparties for hedging and trading activities in a chain of high leveraged of "Too Big to Fail" banks with short funds and illiquidity internal crisis, which expanded across shadow banking manipulations, unethical corporate governance and poor risk management measures in a growing innovative and complex environment of financial instruments encountered under an over securitization chain that supported the U.S Crisis Subprime mortgage crisis.

Consequences evidence in job losses and business closures, banks interrupted its lending activities and a reduced credit issuance to business and consumers. IMF (2009) states the market capitalization of global banks has dramatically fallen from \$3.6 trillion to \$1.6 trillion, as well as the value of preferred shares and subordinated debt.[6]

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[6] See IMF Report, 2009, p.31

Banking crisis van start with difficulties on the liabilities side which could lead to a run of depositors of banks or failures in the interbank deposits, consequently a decline of the value of loans, trading portfolios, real estate and other collaterals of banks[7]

The outcomes of the crisis unexpected to policymakers and regulators, who perceived gaps in the previous lax regulations lead to a micro and macroeconomic policy to protect the economy against the financial crisis.

## 2.3 The Basel Committee on Banking Supervision

### 2.3.1 The origin

To prevent future potential financial crisis in the banking system , the *Basel Committee on Banking Supervision (BCBS)* , established by the central-bank governors of the G-10 countries in 1974 , who met in Basel, Switzerland at the *Bank for International Settlements (BIS)* with the objective of improving the quality of banking supervisory standards and guidelines as well an stable financial environment. Basel Accords has expanded their regulatory measures from G-10 to 45 institutions around 28 jurisdictions. Hearth quartered at the International Settlements in Basel, the first Committee was held in February 1975 as the *"Concordat"* for supervising institutions of bank's foreign branches, subsidiaries and joint ventures which posteriorly in 1983, was launched as a revised version: *"Principles for the supervision of bank's foreign establishments"* [8].

## 2.4 Basel I

With the booming of international active banks worldwide, the Committee resolved the need of new capital adequacy measurements for the increasing riskiness exposure and a decline in capital ratio levels in relation to its growing size, fact that was surfaced by the Latin American debt crisis in 1980's and underperformance of a simple ratio. *Basel Capital Accord* released in 1988, concerned of capital inequality requirements stated a "*minimum ratio of capital"* of 8% measured by risky-weighted assets, as Tier components are not equally capable for protecting banks.[9]

The inclusion of "Tier 3 capital" and the "Market Risk" tailored the potential capital losses on-and off-balance sheets, from changing financial markets in terms of foreign exchange, traded-debt securities, equities, commodities and

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[7] see Mykdashi, 2003, p. 5

[8] See BCBS, 2020 *History of the Basel Committee*
[9] See BCBS, 2020 *Basel I: The Basel Capital Accord*

options, implying the incorporation of an internal model system "Value-at Risk" calculated in daily basis[10] .

The formula for CAR is:

$$CAR = \frac{Capital}{Risk\ Weighted\ \ Assets}$$

Source: BCBS (2020)

The Basel I Types of capital:

a) Tier 1: Common stock, preferred shares and disclosed bank reserves, deemed as the most liquid.
b) Tier 2: Undisclosed reserves, hybrid instruments and subordinated debt.[11], considered riskier and supplementary provisions
c) Tier 3: Short term Subordinated debt

BCBS stated a framework of weights by four risk weights:

1. 0%, for loans to sovereigns (OECD states), cash, bullion, home country debt.
2. 20%, securities, claims in OECD and multilateral development banks
3. 50%, residential mortgages, and, municipal revenue bonds.
4. all other risky loans (e.g. loans to corporations)12, as corporate bonds and claims from non-OECD banks and less-developed countries, equities, real state, plant and equipment and unsecured loans.

### 2.4.1 Critics to Basel I

Criticized by its limited and non-risk sensitive approach, whose asset weighting ignores the different bank's size. Basel I was claimed as "Broad Rush" by Jaime Caruana, Governor of the Banco de España, appealing about its simplified nature of the minimum CaR excluding macroeconomic and default risk.

In addition, capital was not enough to support bank's activities, thus , banks were encouraged to use "Securitization" techniques, transferring illiquid assets through Special Purpose Vehicles (SPV), to liquid ones.[13] As a result, banks had the facility to manipulate their capital adequacy burdens through bank arbitration (economic and regulatory capital requirements), which is

[10] See Basel Committee on Banking Supervision, Amendment to the Capital Accord to incorporate market risk,2005, p.11
[11] See Basel Committee on Banking Supervision, 1988, p. 18
[12] see Kredit und Finanzen, 2007, p. 1
[13] See Jackson, et al., 1999, p. 3

criticized by authors like "gaming inventive" [14] .Therefore, Benik (2020) argues about an equal approach for private loans, incentivizing to  involve in risky loans with higher profitable returns. Finally, Moosa (2015) argues about its discriminatory and reactive nature rather than an anticipatory approach, stating that VaR lack of reliability for calculating the optimal regulatory capital.

## 2.5 Basel II-New capital framework

Released in 2004, denominated the *"International Convergence of Capital Measurement and Capital Standards",* enhanced quality of risk management and supervision of innovative financial products, under three new pillars.

### 2.5.1 Pillar 1: Capital adequacy requirements

Credit or Default risk is "the risk of loss caused by a counterparty's or debtor's failure to make a promised payment."[15].Therefore to determine a minimum supervisory capital within the risk weighted framework, this pillar stated two new methodologies for the mentioned risk.

First the "*Standardized model",* which is supported by an external credit assessment institutions (ECAI)[16], if approved under national regulators, ratings of assets difference among their asset class being; sovereign, banks, corporate, retail, residential property, commercial real estate or other assets. However, risks measurement cannot be upgraded according to the banks risk management system.

Second, the *"Internal Rating-based Approach"*, a more complex rating system allowing self-measurement of banks to assess borrower's credit worthiness with disclosure information of probabilities of default (PDs) encounter four risk parameters:

1. The PD defines the probability for a borrower to default over a one-year period. Default is commonly referred to when if a payment is past due 90 days. Loans of these types are characterized as "Non-Performing"[17].

2. The loss given default (LGD) is the expected amount of loss that is expected in the case of a borrower's default.  A bank must be able to identify the questionable borrowers and the exposures outstanding in the case of default in order to determine the LGD

[14] See Ayadi , Behr, 2008, p.21
[15] see Van Getsel, Baesens, 2009, p. 25
[16] see Basel Committee on Banking Supervision, 2006, p.19
[17] see Van Getsel, Baesens, 2009, p. 25

3. The exposure at default (EAD) states the amount that the borrower owes at the time of default

4. Lastly the remaining maturity of the exposure (m) will provide assurance of whether the original probability of default needs to be revised and possibly increased[18].

A simple multiplication of these factors *(PD*LGD*EAD)* in accordance with the maturity factor *m* will provide the expected loss. [19]

Third, the "*Advanced Internal Rating Based approach (AIRB)".*[20] bank would provide all the risk parameters that were determined internally on estimations and procedures that were validated by the supervisor.[21]

Basel II, considers also the liquidity risk and enhance the ability to make transactions avoiding the market changes in price and assure enough funding to its specific labilities in a time frame under market risks, for this it was added a new method : the *Value-at-risk model (VaR)*, known as the maximum loss in a portfolio with a loss probability over a time horizon.

### 2.5.2 Pillar 2: Supervisory review

To strengthen bank disclosures by increasing the standards in capital structure, calculation of bank capital adequacy, risk exposure and risk assessments of banks. The strategy called the internal capital adequacy assessment process (ICCAP), supports banks assessments of their capital base as long as their risks (BCBS,2021).

### 2.5.3 Pillar 3: Market Discipline

Aims to improve effectiveness of transparent and public disclosures of information under the market corrections of Pillars I and II in the external reporting of banks. Pilar III states the corporate governance of the industry and assessments by investors, analysts, banks, rating agencies [22]

[18] see Basel Committee on Banking Supervision, 2001, p. 7
[19] see Musch and Ayadi, 2008, p. 27
[20] see BCBS, International Convergence of Capital Measurements and Capital Standards ,2005, p.22-175

[22] See BCBS, Supervisory and Market discipline Review, 2014, p.204-240

### 2.3.1 Critics to Basel II

Despite its sensitive approach, Birn, y otros, (2020) argues an extra flexibility between the *Standardized* and *IRB* approach, that underestimates the credit risk, resulting in a broad inequality and inaccurate results among divers' banks, and refers to an arbitrary play-game feature by which banks kept manipulating their risk calculations to reduce their minimum CaR. Moreover, since the IRB model requires high investments, Uddin, Ahmed, Islam, & Ullah (2015); proves that only big banks can take positive outcomes from its implementation due to its big economies of scale, thus it originates unfair competition in terms. For instance, major US banks, its internal risk assessments struggled to be approved by the supervisory boards (Pakravan, 2014)[23]

Benik& Kaufman (2008) argues that the VaR lack of specifications in their computation and that the minimum CaR is contra productive in the big turmoil negative scenario of large bank losses in 2008.

## 2.6 Basel III

A reform to encounter the post crisis of 2008, issued in December 2010, with a phase duration from 2013 to 2019, to strengthen capital quantity and quality, liquidity and risk assessment by introducing liquidity and leverage ratios with enhanced disclosures in a macroprudential overlay.

Then, based on the same three pillars of Basel II, BCBS made the following enhancements:

### 2.6.1 Enhancement of capital

Introduced macroprudential factors in highly risk and systematic environments.

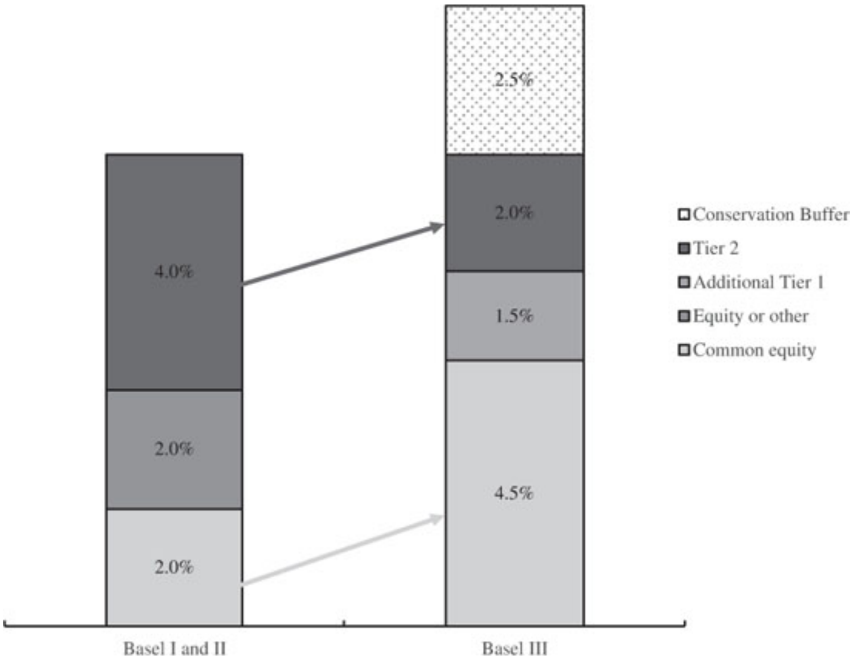
**2.6.1.1 Raising the quality and quantity of capital:** Upgrades in Tier 1, from 4% to 6%, with adding of subcomponent being, the Common Equity Tier 1 (CET1), "top level of quality", from 2% to 4.5%, consisting of common shares issued by banks, stock surpluses, retained earnings, accumulated comprehensive income and other disclosed reserves; and additional Tier 1 capital. Then, Tier 2 one is harmonized and simplified, and the Tier 3 is

[23] See Pakravan, 2014, p.211

abolished. Then Tier 1 capital will be the predominant form of the regulatory capital

The levels of capital adequacy ratio remain under no change with an 8% CAR to the RWA, with upgrades in the risk assigned to securitization holdings from 50% to 1250% approaching specific commercial entities such as SPVs. [24].

Figure 1 Basel Capital Requirements



Source: International Monetary Fund (2019)

**2.6.1.2 Capital Conservation Buffer**: To increase the capital safeguard in high stress scenarios. The new ratio is 2.5% of CET1, which is added to the total minimum regulatory capital of 8% resulting in a 10.5%. Compromises 60% low risk assets (common equity) and 40% risk weighted assets. No implementations by banks results in the suspension of dividends provisions, share buybacks or bonus payments[25] .

**2.6.1.3 Countercyclical Buffer:** To address potential losses during periods of credit growth redeem as “procyclicality”, the extra charge is 0-2.5%from capital conservation buffer. Then CET1 can range from 7% to 9.5% [26]

[24] See BCBS, Basel III: A global regulatory framework for more resilient banks and banking systems, 2011, p.27
[25] See BCBS, Basel III: A global regulatory framework for more resilient banks and banking systems. 2011, p.56
[26] See BCBS, Basel III: A global regulatory framework for more resilient banks and banking systems. 2011, p.57-60

### 2.6.2 Risk coverage of capital

Basel III added the counterparty credit risk management standards arising from the OTC derivatives, repos and securities financing activities, by raising the capital for using stressed inputs with capital charges that addresses market volatility and reduces practicality. Additional incentives are given to move OTC derivatives contracts to central counterparties to reduce the systemic risk of the financial system. Furthermore, standards for the collateral management were strengthened, banks with large and liquid derivative exposures to counterparties will have to apply higher periods to determine their regulatory capital requirement

### 2.6.3 New Leverage ratio

In the context of the 2008 crisis, banks had the highest leverage levels, which became risky as those were built from short term borrowings. The new ratio of 3% adjusted to bank's size, on-and off-balance sheet assets of total bank capital, acts as "backstop" measure tackling excessive deleveraging in an unweighted asset basis [27]. Furthermore, it is a non-risk based that measures the risks-based capital ratio of excessive leverage on account of low risk assets.

$$Leverage\ Ratio = \frac{Tier\ 1\ Core\ Capital}{On\ balance\ Sheet\ Assets + Off\ Balance\ Sheet\ Assets}$$

Source: BCBS(2010)

Limiting the assets level of the first-grade tier capital, it is calculator in a monthly basis

#### 2.6.3.1 Extra measures for globally systematically important banks(G-SIBs)

The moral hazard from "Too big to Fail banks" in the GFC, motivated the inclusion of an additional ratio of 1-2.5% of RWA for Global Systemically important banks for increasing the capability of absorbing potential losses. (BCBS, 2016)

[27] See BCBS, Basel III: A global regulatory framework for more resilient banks and banking systems. 2011, p.119

### 2.6.4 International Liquidity Standards

Shortcomings to limit the excessive maturity mismatch resulting in increasing proportions of long dated assets being financed by short term borrowing in the 2008 crisis, where bank´s capital was not sufficient to overcome the lack of liquidity practices as those excessively depended of wholesale funding terms. Then, the instauration of the following ratios:

**2.6.4.1 The Liquidity Coverage ratio (LCR):** Banks will have to maintain high-liquidity assets under stress scenarios, LCR should be equal or above the 100% of bank expected cash outflows in a 30-days period under stress testing scenarios including downgrading of public credit rating, loss of deposit or unsecured wholesale funding. Thus, LCR includes two categories of asset

Table 1 LCR Asset composition

| **Level** | **Assets** |
|---|---|
| Level 1 | Coins and bank notes<br>Central bank reserves<br>Marketable securities with 0% risk weight |
| Level 2 | Marketable securities with 20% risk weight<br>Corporate debt securities (including commercial paper)19 and covered bonds (mi. Rating of AA) |

*Source: BCBS(2014)*

And the formula:

$$LCR = \frac{HCQLA}{Total\ Net\ Liquid\ Outflows\ 30\ days - time}$$

Source: BCBS (2010)

HQLA (High quality of Liquid Assets), being, cash and banks notes and government bonds (100%) of liquidity level, and corporate bonds with (0-50 %), thus, the higher liquidity, more facility in selling it during crisis periods. Its reporting should be made in a monthly manner[28] .And , the net liquid outflows (NLO) are the total expected cash flows under the stress scenario.

[28] See BCBS, Basel III: The liquidity coverage ratio and liquidity risk monitoring tools, 2013, p.7

**2.6.4.2 The Net Stable Funding Ratio (NSFR):** To reduce the banks incentive of short-term funding, NSFR orients banks towards long and stable funds, requiring minimum number of stable sources of funding relative to their liquidity profile of assets and contingent for off-balance sheet commitments in one-year period.

$$NSFR = \frac{Available\ Stable\ Funding(ASF)}{Required\ Stable\ Funding\ (RSF)}$$

Source: BCBS (2010)

*ASF* includes capital and liabilities with maturity more than one year, supposing liabilities will be stable. Then *RSF,* based on the liquidity risk profile of the institution[29] gives more weight to asses that become less liquid during stress periods. High levels of NSFR would make banks loan supply more stable and reinforce high liquidity levels to high risks and finance their premiums.

## 2.7 Impact of the Basel III in banks: A look at previous researches

Intercountry discrepancies about the Basel regulation's capacity to cover the systematic financial system has produced a set of stringent adjustments since their first inception in 1988.Therefore, Basel III regulations have been addressed straightforward to shortcomings in capital, liquidity, leverage, risk management, etc.

Many authors criticize Basel III as a multi-size banking system by which Luxembourg (2016) appeals as a "one-formula" that neglected banks diversity. Conversely, Rizwan (2018) states about a beneficial output of Basel III by empowering banks to overcome negative externalities in a systematic financial system under high stress scenarios.

Basel III is constantly in evolution and amendments, previous researches have analyzed the impact of Basel diversely, most of them use empirical models to find the factors driving to a reduction in profitability, other analyze the effect of specific ratios measure in lending, and profitability. However, they focus on OECD and developed countries from a quantitative analysis of banks financial statements, pre-and post-implementation.

[29] See BCBS, Basel III: The Net Stable funding ratio, 2014, p.2-7

### 2.7.1 Impact in RoE and profitability

Some authors appeal to a reduction effect in profitability. Banerjee and Mio (2017) analyzed the effect of liquidity ratios in the banking sector balance sheets pre and post UK implementation, its study is limited to the impact of Tier 1 and RWA in UK banks , concludes that banks are more incentivized to invest in less risky and liquid but low return assets and non-bank deposits, therefore, there is a reduction in lending and short term wholesale funding, which reduces the net interest income and by consequence the profitability.[30]

Additionally, Luxembourg (2016) analyzing Basel III implementation in European banks post GFC, argues RoE is affected primarily by two factors: a reduction in profitability (income), and, the increment of capital and funding requirements. Focusing in the differential impact between large and small banks. It concludes that large under risky banks, would rather focus on increasing their returns to comply with the same minimum ratio, while small and riskier banks would be the most affected by demanding higher equity and common shares, thus switching towards low risk and return assets which would reduce profitability levels evidenced in 2015 by "average RoE of 5% in 2015, with a cost of capital of 9%" enhanced in a low interest rates environment.

BCBS (2021) focusing as well in European banks noticed a decreasing RoE trend indifferent of the bank's types due to the lower leverage ratio and the higher credit and operating costs . Accordingly, EBA (2019) estimated an increment of 24 percent as the minimum capital requirements, would increment the lending costs, thus reduce the lending provisions, under deleveraging process that reduces banks total capitalization.

Conversely, Mashamba (2018) focusing in emergent countries, develops an empirical that analyses the liquidity ratios impact in 40 commercial banks from 11 emerging countries from 2011 to 2016, which contradicts, the banking theorem that LCR incentive banks to hold high liquidity assets whose low return reduce net interest income stream general profitability. Contrary, he founds, a tendency for more liquid assets redeem higher safety levels, thus profitability, attracting investors interests of stock ownership of this banks, which, can potentially increase the market capitalization of banks as well. Finally, it evidences a growing demand in deposits, normally paying low interest in emerging markets, have boosted the profitability levels in emerging banks. Therefore, banks have specially focus on increasing their retail deposits.

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[30] Assuming that banks with large deposits can be assumed as well to be more profitable since they have more funds to loan

### 2.7.2 A view in funding

Most studies assess the impact of Basel III liquidity ratios .Luxembourg (2016), analyzing European banks concludes that holding cash rather than high quality securities as well as an increase cost of funding and difference in interests from the time premia, deriving in banks preferring long term funding in on and off- balance sheets , rather than short term . Evidence that short term funding is 40% of total liquidity in European banks, while the NSFR reach 80% of it and representing approximately 15 % of the whole funding in Europe. EBA (2019), analyzing G-SIB's EU banks, evidence an increase of NSFR from 42% in 2012, to 115% in 2016 and a reduction of trading assets and complex securities specifically the OTC derivatives. (BCBS ,2021)

Some studies analyze the impact in cost of capital, Stattin (2018), using a CAPM and DCM cost of calculation model, proved its T-test hypothesis with 99% confidence level, that one-point unit increase in capital ratio decreases the cost of capital by 0.018-point post Basel III implementation in in Swedish, Finish and Nordish banks.

Only supported by Gambacorta and Shin (2016), analyzing international banks from advanced economies between 1994 and 2012, concluded that one bp increase in equity to total assets ratio, leaded to a reduction in 4 bp of the total capital costs of debt funding such as deposits, bonds, interbank borrowing, etc., resulting in more enhanced debt raising. Copenhagen Economics (2019) analyzing large size American banks compared to Europeans, concluded EU banks have a bigger impact than US banks in cost of capital due to their smaller size.

### 2.7.3 Tradeoff safety vs. risk management

Dagher et al. (2020) estimated 15 to 23 percent of RWA in banks from advance economies, transform them more stable and reduces the potential crisis negative effects, however, at the time, no literature has studied its effects on banks credits costs.

Llewelyn et al. (2017), analyzing the impact in default probability (DP) of commercial Islamic banks, concluded that one-point increase of capital decreases in 2.2% the DP, however, default risk is sensitive to the bank's size. Additionally, Giordana and Schumacher (2017) with an econometric analysis from 2003 and 2011 of Luxembourg historical bank's NSFR and LCR, concluded those that reduced DP, and estimated “a one percent increase in the available stable funding ratio increases the profitability of a bank by 0.201”. Researchers have built a tradeoff balance between safety and profitability.

Others relates DP to risk management, Bhatti et al. (2019) and Rizwan et al. (2018) and state that higher supervisory levels measured by the “private monitoring index” impact positively the default risk, however, overconfidence reliance in it, especially in emerging of developing countries, can lower banks risk management practices. However, Chortareas et al. (2011), states that higher regulatory controls in banking activities result in less efficient levels of operation and that higher capital requirements incentive bank' managers to pursue high risk strategies, thus increasing its probability of default.

Fender& Lewrick (2016) affirm  EU banks have hold an excess of capital, under the stress test scenario,then Anhert et al.(2018), analyzing the impact of stress testing in bank's equity and CDS performance in US and EU banks, between 2010 and 2017, proves stress testing increased equity returns (36 points) and CDS spreads (72 points),stating that results depend of banks profile, for instance ,banks with high capital and low LR with no-risky business models are more willing to obtain positive results post stress -testing.

### 2.7.4 View in Lending

Again, most of the research is limited to a European scope; Copenhagen Economics (2019) demonstrated that banks in the need of aligning to higher capital requirements, undergo in a deleveraging process, which would reduce credit availability up for lending to 2.9 trillion euros. Thus, the extreme deleveraging action, in combination manipulation in balance sheets, would increment banks' lending costs, equivalent to an average of 0.5% of European GDP growth, and finally reduce the average lending provisions.

This is supported by Stattin (2018), with a regression model concluded "one unit increase in capital, decrease the lending growth by 10.19 units" in E.U banks. Luxembourg (2016), concluded that retail European banks would have higher lending costs reflected in costs over 50 bp in short loans, while in mortgages and others the cost remains under 50 bp, its long-term retail loans also incur in higher total costs[31] because of the growing liquidity and funding requirements.

Furthermore, they say the major impact is the increment over 50 bp costs in structured or trade finance products of corporate and retail banks then reducing its capital provisions for its business operations and profitability. Moreover, the impact can also be sensitive to banks size, hence, large cap banks could diminish their lending provisions while small cap banks increase their lending activity.

Finally, Jorda (2017), analyzing the long-term evolution of the capital, solvency and liquidity from 1870-2013 in 17 OECD countries, concluded that big capital can reduce the crisis costs by sustainable lending practices.

[31] Total costs include capital, liquidity and funding costs

# 3 Research methodology

## 3.1 Research subject

The research question of this study analyses the effects of the implementation of Basel III, in terms of lending, risk, profitability, stability and capital, in two different contexts: Banks from developed and developing countries, from the perspective of bankers and finance experts.

## 3.2 Research Process

### 3.2.1 Research Strategy

The scope of study was set based in the literature review assessing the hypothetical impact of Basel I and II in banks, studying primarily countries separately or conglomerates of developed countries. Those researches were based on a historical methodology, which may bias a specific analysis of the impact of Basel III in banks, as they are exposed to financial crisis, external country risks, etc.

Therefore, this study employs a quantitative research based on the general overview of the implication of banking regulations, outlining expert's opinions about Basel Accords and its hypothetical benchmarking effects within banks in developed and developing countries.

The first part of the research consists on a literature review of reports from the IBIS and IMF, to base the hypothesis on real reports of the banks complying already with Basel III.

Due to the high specific topic, we used the empirical approach based on questionnaires and experts' interviews to bank representatives in developing and developed banks, which is suitable to have a wide perspective of the study taking part in Spain, Switzerland as well as Peru and Equator.

Finally, we will conduct a data analysis using a regression model and T-test for the hypothesis testing and come to the final conclusion.

### 3.2.2 Research paradigms

There are two primary research paradigms that can potentially affect the results of the research; thus, the present study identified the positivist, triangulation and the validity approach.

The positivist approach is based on empirical research therefore this research will incorporate conducting deductive logic with precise empirical observations in a value-free research.

Then, the triangulation approach incorporates the idea that conducting a research by looking from multiple points of view improves the accuracy of research findings.

And finally, the validity approach. in qualitative research does not require demonstrating correlation between carefully defined concepts and a precisely calibrated measure of its empirical appearance. For a research to be considered valid, the researcher's truth claims need to be plausible, arguable and inter-subjectively "good enough" that is understandable by many other people[32].

### 3.2.3 Research Methodology

#### 3.2.3.1 Quantitative and Qualitative research

The study has a qualitative approach with an extent to quantitative methods for explaining the diverse segments impacted by Basel. Thus, the research will have an empirical using questionnaires and bankers' interviews.

For the quantitative method we recollected primary data with surveys to experts and bankers from developed and developing countries. The aim was to obtain a mass of answers for a final descriptive analysis of results. By which we used the Pearson correlation to investigate the correlation phenomena of relationship between the positive or negative impact and the segment of banks.

Moreover, the qualitative framework uses expert interviews to 4 bankers from developed and developing countries. The answers were categorized in positive, negative and neutral perspective, to assess the principal and sub research questions in a more detailed view.

The study is supported in secondary data as well, for instance, thesis dating from the last 3 years maximum, which analyze some countries under some Basel ratios, those would support the setting of the sub research questions and hypothesis.

[32] See Fine, 1999, p. 83

#### 3.2.3.2 Hypothesis

As we indicated earlier the impact within banks from developed and developing countries is estimated to be different as Basel III implementation is subject to a different external country scenario like political problems, divergency between fiscal policy or lack of national regulations supporting the implementation.

Therefore, to have a wide approach of the impact of the implementation, the sampling was based on bankers with experience in developed and developing banks, for the questionnaire and the interviews as will to finally categorized their perspective in a positive or negative impact in , stability capital, profitability, risk management, lending, and default.

To achieve this, firstly, I recorded the data concerning their views and set the Null Hypothesis (Ho) and the Alternative Hypothesis (HA) of the thesis.

**$H_0$: μ=0:** Basel III implementation have a negative impact in banks from developed and developing countries

**$H_{A:}$ μ≠ 0** Basel III implementation have a positive impact in banks from developed and developing countries.

Assuming the sample minor than 30 based on a normal distribution with an unknown variance, the most suitable statistic measure is a two-tailed T-test for the hypothesis testing, which is highly conservative and mostly used for comparing effects on a variable from a specific event, and find whether the change is statistically significant (Kaplan ,2021). T-value under the following formula:

$$T = \frac{\bar{x} - \mu}{s/\sqrt{n}}$$

Source: BCBS (2010)

Where:

**x** represents the sample mean.
$\mu$ the hypothesized mean value.
**n** is the number of observations

**s** is the standard deviation of the sample

The numerator is referred as the signal (size of the effect), and determine by the variability of the mean, then indicated in Standard error how large the differences are. Depending of the significance level, the p-value inferred from the T-test, says the probability of observing differences from the hypothesized value, then if the p-value is below the chosen significance level, the differences have statistical significance, if not, no significant difference are evidenced in the sample.

In addition to the T-test, a regression analysis with the variables outlined in the research questions is mandatory to explain the changes in a chosen dependent variable from changes in a number of chosen independent variables simultaneously (Sauders et al., 2012, p.23)

### 3.2.4 Instruments

#### 3.2.4.1 Questionnaire

With the objective of obtaining segmented information from professionals in developed and developing countries.

The set of 28 questions was structure in 9 sections first (1) personal information, (2) awareness of the tradeoff and the possible benchmark of Basel implementation within developed and developing countries. then the impact in (3) stability, (4) capital and funding. (5) profitability, (6) lending (7) risk management practices (8) default and a (9) view towards some Basel approaches.

The majority of the questions were opened to have more details of their positive or negative impact.

Respondents were chosen based on their awareness level of the Basel III Accords and banking regulation targeting wealth managers, private bankers, treasury executive.

See appendix 1 for questionnaire

#### 3.2.4.2 Interview

The structured interview deepens the scope of the research, by targeting bank professionals in fields like Asset, Wealth, Credit management, and others based on banks from developed and developing countries.

See annex 2 for interview questions and scripts

## 3.3 Data collection

### 3.3.1 Survey collection

Since the topic of the research is highly specific, we pre-screened the interviewees and professionals filling the questionnaire, the data was collected from April to May 2021 with 15 surveys filled, by experts-based working in banks from developed and developing countries. Moreover, the interview was held in a structured to experts in Asset, Wealth Management, Private Banking and a Central bank in countries like Switzerland, Spain, Equator and Peru.

# 4 Findings

The results were segmented according to the sub resea4rch questions formulated into categories including stability, capital, profitability, lending and risk management practices and default, to consequently analyze whether those perceived a positive or negative impact by Basel III implementation

Given that this study is an initial attempt to advance a theorical model that investigates furtherly the level of impact of Basel Accord, the fit to an exploratory approach was highly favorable for a quantitative analysis by statistics. The data obtained will set the hypothesis testing phase which will define the conclusion of the thesis

## 4.1 Descriptive analysis of questionnaires

1. *Do you think there is a tradeoff between the benefits and costs of Basel regulations implemented by banks?*

| Responses | Selected | Percentage |
|---|---|---|
| A.Yes | 11 | 73% |
| B.No | 4 | 27% |
| C.Maybe | 0 | 0% |

Source: Researcher survey

Since the GFC, regulation in the banking industry increased. Basel III was an immediate measure with increments of the capital and liquidity levels. While some banks would claim about the increase of the costs, some literature affirm that capital is expensive to hold, then increasing its lending spreads and deteriorating the economic growth. Therefore, results showed that 73% stated Basel III brings a two-side effect (negative and positive) to banks.

2. *Do you think that potential higher costs of implementing Basel Regulations might not be justified in banks whose financial turnover may not allow them to follow the required ratios from the accord?*

| Responses | Selected | Percentage |
|---|---|---|
| A.Yes | 10 | 67% |
| B.No | 3 | 20% |
| C.Maybe | 2 | 13% |

Source: Researcher survey

Despite the *International Banker* (2019), affirmed 81 jurisdictions of 100 surveyed reported having implemented at least one of the Basel components, results showed that 67% of respondents affirmed that Basel III regulations are not justified in banks whose financial turnover might not allow them to comply with the required ratios of Basel due to the high cost of implementation , then affecting banks profitable in certain bank's business models with low annual turnovers , typical of "weak" financial system or some small economies .Only one respondent stated the importance of Basel global approach. Then, 20% of respondents affirmed that Basel implementation is equally worth in banks from developed and developing countries, as Basel would set the base for robust and reliable financial services infrastructure and growing economies.

3. *Do you believe that developed countries have a competitive advantage in the implementation of Basel Regulations rather than developing countries?*

| Responses | Selected | Percentage |
|---|---|---|
| A.Yes | 12 | 80% |
| B.No | 0 | 0% |
| C.Maybe | 3 | 20% |

Source: Researcher survey

This question assessed the hypothetical differential impact between Basel implementation in banks from developed and developing countries. Hence, 80% of respondents affirmed banks from developed countries might have a beneficial position due to higher "*know-how*", advance used of IT technologies, thus, more accessibility to capital at low cost of capital in a stable environment. However, some stated that, indeed, implementation efforts were equal between both banks.

### 4.1.1 Perspective in stability

4. *Do you think Basel Accords has improved to the stability of banks?*

| Responses | Selected | Percentage |
|---|---|---|
| A.Yes | 12 | 80% |
| B.No | 0 | 0% |
| C.Not sure | 3 | 20% |

Source: Researcher survey

The Basel III conference (2011)[33] affirmed that to ensure the long-term stability, there is a need of constancy of a timely global adoption that address the Too-Big-To-Fail banks denominated as the systematically important banks (SIBs). Therefore, 80% of the experts affirmed that Basel enhanced stability, hence less risks for investors, shareholders and banks, but decreasing the profitability. Only 20% was unsure of the impact in stability.

5. *Can you rate the level of stability improvement at a bank level?*

| Responses | Selected | Percentage |
|---|---|---|
| A.High | 10 | 67% |
| B.Medium | 5 | 33% |
| C.Low | 0 | |

Source: Researcher survey

67% of the respondents perceived that banks stability has highly improved, however one respondent argued a side effect of higher to central banks.

[33] See https://www.bis.org/speeches/sp110406.pdf

### 4.1.2 Perspective in capital and funding

6. *Do you believe banks implementing the Basel Regulations have overcome to higher capital than the suited to bank's structure and business operations?*

| Responses | Selected | Percentage |
|---|---|---|
| A.Yes | 11 | 73% |
| B.No | 3 | 20% |
| C.Maybe | 1 | 7% |

Source: Researcher survey

While the Basel III Monitoring review (2019)[34] showed different increments levels of capital within different bank groups. CET1 has increased slightly in Europe and Americas compared to the rest of the world while the Tier 1 has decreased .We wanted to figure out how many of them considered that banks overcame with higher capital that the tailored to their operations, as some literature appeal to Basel as the "one-law" implementation. Then, 67% confirmed that banks had higher capital levels that do not comply with their size and structure, finally redeeming in economic pressure.

7. *Do you think Basel Accords has strengthened banks' balance sheets?*

| Responses | Selected | Percentage |
|---|---|---|
| A.Yes | 8 | 53% |
| B.No | 0 | 0% |
| C.Not sure | 7 | 47% |

Source: Researcher survey

As one of the main reasons for GFC was the excessive on and off-balance sheet leverage, insufficient liquidity buffers, the Basel reduced the ratio of assets that banks build up in relation to deposits, therefore banks should include their off-balance sheet exposures in their leverage ratio under no risk adjustment of maximum 3%. Results showed that 53% of respondents believed Basel impacted positively banks quality and structure of balance sheet.

[34] See https://www.bis.org/bcbs/publ/d477.pdf

8. *In which terms do you think the increment in quantity and quality stated by the Basel Regulations of bank's capital has impacted banks?*

There is notably a two-side effect of Basel perceived by experts. The majority evidenced that more solid equity positively influenced banks, by preventing them from insolvency in case of a significant fall of asset prices, thus banks would have a more "comfortable" position in high volatile scenarios. Others highlighted Basel implied t more protections for investors.

However, some respondent evidenced a negative impact at a lending level, stating banks use Basel III as an excuse for not lending as much as post GFC, thus less lending provisions available, by which banks would incur in higher operating costs than profits. Finally, some stated a differential effect of higher capital requirements within US and EU banks, highlighting that the asset and wealth management departments have been more impacted compared to other bank departments.

9. *Do you think the increment in quantity and quality stated by the Basel Regulations has impacted bank's cost of capital?*

| Responses | Selected | Percentage |
|---|---|---|
| A.Yes | 12 | 80% |
| B.No | 0 | 0% |
| C.Maybe | 3 | 20% |

Source: Researcher survey

The traditional theory of capital structure when the weighted average cost of capital (WACC) is aimed to be reduced, and the value of assets in the market maximized, then an optimal capital structure is created under a mix of debt and capital[35].Then results showed that 80% believed Basel III increased the cost of capital based on the Ceteris paribus formula, arguing about its positive impact by reducing risk of the overall financial system.

[35] See https://ocw.mit.edu/courses/sloan-school-of-management/15-402-finance-theory-ii-spring-2003/lecture-notes/lec14awaccapv.pdf

10. *Do you think the implementation of Basel Accords has changed bank's capital funding structure?*

| Responses | Selected | Percentage |
|---|---|---|
| A.Yes | 14 | 93% |
| B.No | 1 | 7% |
| C.Not sure | 0 | 0% |

Source: Researcher survey

The liquidity ratios required banks to retain sufficient high-quality liquid assets to survive in a 30-days stress scenario and avoid excessive reliance on short term financing which is normally more sensitive to the volatility of the market, therefore with the NSFR, banks liabilities should match with banks financing sources.

Results showed that 93% of respondents evidence a decrease in funding, with no differential preference towards short term or long-term funding.

Only 7% of respondents perceived no change in the funding structure, arguing about the difficulties for assessing banks strategy changes, as banks could manipulate liquidity ratios to meet with Basel requirements.

11. *Do you think the implementation of the LCR (Liquidity coverage ratio) from the Basel Accords, implying banks to switch towards high liquidity assets, has impacted banks?*

| Responses | Selected | Percentage |
|---|---|---|
| A. Increase the holdings of high-quality securities holding | 9 | 60% |
| B. Decrease the holdings of high-quality securities holding | 0 | 0% |
| C. Preference towards Long term funding | 0 | 0% |
| D. Preference toward short term funding | 4 | 27% |
| E. Preference toward higher liquidity assets | 1 | 7% |
| F. Preference toward lower liquidity assets | 1 | 7% |

Source: Researcher survey

60% of respondents stated that LCR ratio made banks increment their high-quality securities holdings, which resulted in less interest rates margins. Then, 27% respondents stated banks preferred short-term funding rather than long term funding.

### 4.1.3 Perspective in profitability

12. *Do you think the implementation of Basel Accords impacts the profitability of banks in terms of RoE?*

| Responses | Selected | Percentage |
|---|---|---|
| A.Increase | 7 | 47% |
| B.Decrease | 6 | 40% |
| C.No change | 2 | 13% |

Source: Researcher survey

47% of respondents argued Basel have increased banks profitability, stating that, despite the theory “lower risk, lower return”, they perceived an increment in RoE, which might have been driven also by the parallel effect of Basel, being the reduction of default risk probability.  Others argued that Basel has incentive banks to charge higher fees, then resulting in higher revenue streams.

40%, evidenced a decrease in profitability due to stronger capital requirements, highlighting that a parallel reduction of lending provisions has been a significant driver of this decrease, but that banks could employ protection measures against its lending behavior.

### 4.1.4 Perspective in lending

13. *How has been the impact of Basel Accords in the lending provisions of the banks?*

| Responses | Selected | Percentage |
|---|---|---|
| A.Increase | 9 | 60% |
| B.Decrease | 4 | 27% |
| C.No change | 2 | 13% |

Source: Researcher survey

Some empirical past evidence dating the effect of Basel I and II, state that liquidity ratios and higher capital influence the lending provisions of banks, as banks would prefer investing more liquid assets than lending to the private sector, hence the effect can be enhanced in an environment of easy monetary policy, zero interest rate on government bonds , then loan spread are weaker implying higher loan spreads (Berger and Bouwman, 2009) . However, a theory from of Chami & Cosimano (2001) states that an increase of demand for loans, decrease the marginal cost of them then leading to the optimal amount of loans.

Aligning with this connotation, 60% of respondent perceived an increment in lending provisions with a tradeoff effect of higher stability, at the cost of higher lending costs. Contrary 27%, stated that Basel has actually decrease the lending provisions of banks.

14. *Select from the followings, the impacts of Basel implementation in the lending behavior of banks.*

| Responses | Selected | Percentage |
|---|---|---|
| A. Implementation of higher credit risk credit assessment | 11 | 73% |
| B. Change in financing terms | 2 | 13% |
| C. Preference towards low risk clients(corporates) than households | 2 | 13% |
| D.Others | | |

Source: Researcher survey

Findings from previous researches, post GFC, argued that European banks increased its capital at the cost of reducing their lending amid pressures to shrink their assets when holding buffers of high liquid assets as well provisions based on low-yield, risky, semiliquid loans. However, there is also some patterns that have not been explored, therefore this question proposed some alternatives by which ,73% stated banks have implemented higher credit risk assessments, but only 13% noticed a changed in the financing terms, and other 13% argued about a preference towards low risk clients such as corporates rather than households.

15. *Do you think that Basel Accords impacts the banks' lending costs?*

| Responses | Selected | Percentage |
|---|---|---|
| A.Yes | 4 | 27% |
| B.No | 11 | 73% |

Source: Researcher survey

The model of Chami & Cosimano (2001) argued that when higher capital constraints lead to additional demand for loans thus higher loan rates.

73% of respondents did not perceived an impact in lending costs, stating that some agreements already protect institutions from this effect like the transition of CHF Libor to Saron. Contrary, 27% noticed higher lending costs as banks collateral increased as well, however they highlighted the effect is also dependent of banks strategies and size.

16. *Do you think Basel regulations create funding gaps for the project financing by banks? Do you think banks from developing countries might be more affected?*

| Responses | Selected | Percentage |
|---|---|---|
| A.Yes | 9 | 60% |
| B.No | 5 | 33% |
| C.Not sure | 1 | 7% |

Source: Researcher survey

To assess the perspective towards the hypothetical project financing capacity of banks in developing countries due to the Basel III.

47% respondents perceived banks in developing countries might have been more affected. Basel incentives low risk investments, however, most of the developing countries tend to have high risk investment opportunities in a volatile market, leading to less lending provisions for investments in those markets. Furthermore, they argued bank in developed countries had a competitive advantage due to their robust legal and financial system, as well as their significant *"Influence at the table"* of the BIS that connect them to regulators from the developed nation. Additionally, some stated that banks in developing nations have already an internal criterion that let them better adapt to string regulatory burdens of Basel III.

Finally, some stated banks were affected by Basel itself, but because of the negative interest environment.

17. *Do you think the bank credit ratings assigned by the top three third-party agencies can impact more negatively the lending provisions of banks in developing countries rather than in developed countries?*

| Responses | Selected | Percentage |
|---|---|---|
| A.Yes | 10 | 67% |
| B.No | 5 | 33% |
| C.Maybe | 0 | 0% |

Source: Researcher survey

Aiming to assess the hypothetical differential effect of the credit ratings, provided by Moody's, S&P and Fitch, (External Credit Assessment Institutions (ECA), in the implementation of the "Standardized" credit assessments.

Results showed that 67% perceived that credit ratings provided to banks in developing countries can negatively affect its lending provisions, contrary to 33% who argued that these institutions have existing metric to asses banks, hence, no differential impact perceived.

### 4.1.5 Perspective of risk management practices

*18. Do you think the implementation of Basel Accords have impacted banks risk averse profile?*

| Responses | Selected | Percentage |
|---|---|---|
| A.More risk averse | 9 | 60% |
| B.Less risk averse | 4 | 27% |
| C.No change | 2 | 13% |

Source: Researcher survey

The International Banker (2019) argued that banks in the Sub-Saharan African (SSA) reduced significantly their lending provisions, as customer loans are usually illiquid, instead preferring cash in their assets portfolio due to the higher liquidity.

Then, 60% affirmed that Basel III has made banks more risk averse, not only by the implementation of ratios but also in terms of risk culture as banks are back up by higher capital ratios that protect them against insolvency. The other 27% stated banks have become less risk averse highlighting that banks have just adjusted their risk allocation from credit to other financial products. Finally, only 13% stated no change perceived, arguing that it is the negative interest environment that promoted effects in the banking industry not the Basel III regulation itself.

*19. Do you think Basel Accords implementation have changed risk management and hedging practices in banks?*

| Responses | Selected | Percentage |
|---|---|---|
| A.Yes | 8 | 53% |
| B.No | 7 | 47% |
| C.Not sure | 0 | 0% |

Source: Researcher survey

Assessing an impact in risk and hedging management practices, 53% perceived banks optimized risks by switching towards high liquidity securities and liquid assets named as *"clean"* carrying lower risk. Furthermore, some respondents argued that banks adequate differently leveraging on their strategic financial engineering. Moreover, they stated banks hedging process became more transparent and simpler. Contrary, 47% stated that banks have not changed their risk management practices as they still want to maximize their returns.

20. *Do you believe Basel implementations have encouraged banks to switched towards less risky and complex securities or structured products?*

| Responses | Selected | Percentage |
|---|---|---|
| A.Yes | 8 | 53% |
| B.No | 3 | 20% |
| C.Not sure | 4 | 27% |

Source: Researcher survey

The GFC revealed banks were highly leveraged, for that reason, the LR aimed to enhance banks' loss -absorbing capacity, however, there might be some incentive to increase risk taking sue as the LR is a not risk-based ratio. Results showed that 53% of respondents believed Basel reduced their high complexity and risk products holdings. Finally, they highlighted that the LCR created a need for more flexibility in the securities holdings as well as improving banks' ability to exit quickly.

21. *Do you think the "Internal Risk Approach" (IRA), can be significantly more challenging for banks than the "Standardized model"?*

| Responses | Selected | Percentage |
|---|---|---|
| A.Yes | 8 | 53% |
| B.No | 7 | 47% |
| C.Not sure | 0 | 0% |

Source: Researcher survey

Assessing the effect of credit assessments, 53% respondents argued that IRA implementation is more challenging than the standardized model, as they demand high qualified workforce and more time for its set up, however, some stated that the difficulties affronted is justified as banks can choose their assessment based on its size and business model. Contrary, 46% stated that IRA is challenging for banks as it allows to compute their own KPIs.

22. *Do you think that the implementation of "Stress testing" required by the Basel Accords is beneficial for the banks?*

| Responses | Selected | Percentage |
|---|---|---|
| A.Yes | 13 | 87% |
| B.No | 2 | 13% |
| C.Not sure | 0 | 0% |

Source: Resarcher survey

As stress testing is a tool for assessing the contagion effects against buffers covering country or region risks under assumptions in different time horizons, therefore, it is generally viewed as an strategic tool of business intelligence, there strengthening the risk appetite, balance sheet risk and capital management.

87% perceived a positive impact of stress testing implementation, as it would provide concrete remediation actions and an enhanced transparent image reputation for the banks. Indeed, despite the set up might be challenging, the execution would not.

Only 13% believed in a negative effect of stress testing implementation due to the higher costs in qualified workforce incurred.

23. *How challenging do you think is the implementation of stress testing?*

| Responses | Selected | Percentage |
|---|---|---|
| A.High | 3 | 20% |
| B.Medium | 8 | 53% |
| C.Low | 2 | 13% |
| D.Zero | 2 | 13% |

Source: Resarcher survey

Good practices of stress testing depend of earnings forecasting's under, securitized and non-securitized scenarios covering various risk metrics with high quality data. Then results showed that 53% perceived a medium challenge level for its implementation, while only 20% perceived high difficulty.

*24. Which is your main concern of stress testing?*

| Responses | Selected | Percentage |
|---|---|---|
| A.High costs of implementation | 11 | 73% |
| B.Difficulty in implementation | 2 | 13% |
| C.Lack of Employee knowledge for implementation | 2 | 13% |
| D.Higher costs of an internal risk approach rather than a standardized model | 0 | 0% |

Source: Researcher survey

There is a growing concern about the complexity of stress testing, by which banks would need to establish a wide process that encompasses multiple steps by qualified employee's high-quality data source. Therefore, the costs for the stress testing are not limited to the monetary costs.

Results show that 73% affirmed stress testing implied higher costs of implementation, while 13% noticed aa lack of enough expertise of employee for its implementation

### 4.1.6 Perspective of default

*25. Do you believe Basel Accords implementation has impacted the default risk of banks?*

| Responses | Selected | Percentage |
|---|---|---|
| A.Increase | 5 | 33% |
| B.Decrease | 7 | 47% |
| C.Not change | 3 | 20% |

Source: Researcher survey

A firm default if the market value of its assets is less than the debt they have to pay, therefore some experts affirm that Basel has many core indicators of the probability of failure based on the risks like the LCR, NSFR, and others.

47% respondents stated banks and the financial system have been impacted positively due to the decrease of its default risk probability, however, 33% argued banks have actually increased their default risk in the need to integrate more with the high sophisticated criteria's in negative interest context.

### 4.1.7 Perspective in approaches

26. *What do you think about the implementation of a "financial volatility factor" in the Basel Accords to developing countries with high sensitivity to sociopolitical factors, pro-cyclical fiscal policy and commodity prices changes?*

| Responses | Selected | Percentage |
|---|---|---|
| A.Can be a good risk adjusted factor from developing countries | 7 | 47% |
| B.Socio-political , pro-cyclical policy and commodity prices changes from countries are not relevant to the Basel Accords | 3 | 20% |
| C.Is not a good factor to implement | 1 | 7% |
| D.Should be discussed further | 4 | 27% |

Source: Researcher survey

In order to assess expert's perspective about the hypothetical financial volatility factor for developing countries, 47% respondents agreed with its implementation as financial ratios does not have same signification across different countries, contrary, 7% denied completely its implementation.

27. *Do you think regulators should apply a "proportionality approach" to adapt regulations in regions with similar financial systems?*

| Responses | Selected | Percentage |
|---|---|---|
| A.Yes | 7 | 47% |
| B.No | 8 | 53% |
| C.Not sure | 0 | 0% |

Source: Researcher survey

There is a growing concern that Basel might not fit the needs and specific banks scenarios. 53% agreed denied a proportionality ratio implementation as it would make more complicated Basel global approach, thus all the rules should be equal for all banks so the system can be efficient and credible. Finally, they stated that this approach would not make any improvements in banks from developing countries, rather the change is the activities carried on.

Contrary, 47% perceived this approach can actually improve the competitiveness of banks across different markets by providing equal conditions to operate in complex financial systems under stringent regulations.

28. *Do you think systemic risks are inadequately addressed by Basel Accords?*

| Responses | Selected | Percentage |
|---|---|---|
| A.Yes | 5 | 33% |
| B.No | 4 | 27% |
| C.Not sure | 6 | 40% |

Source: Researcher survey

33% of respondents perceived that systemics risks are inadequately addressed by Basel, highlighting a need for a "case by case" assessment, meaning, country by country, conversely, 27% argued that Basel has certainly reduced the systematic risks, however, they said regulations should be yearly updated as potential risks increase in an interconnected financial system across countries that Basel try to asses with the GSIBs approach.

## 4.2 Quantitative results of questionnaires

The answers were segmented in three classes, whether they have a positive, negative, neutral opinion of the impact of Basel III. See appendix 5 for questionnaire data analysis.

Table 2 Quantitative results from questionnaire

| | **Positive** | **Negative** | **Neutral** | **Total** |
|---|---|---|---|---|
| **Stability** | 80.00% | 20.00% | 0.00% | 100.00% |
| **Capital and Funding** | 65.56% | 28.89% | 5.56% | 100.00% |
| **Profitability** | 46.67% | 40.00% | 13.33% | 100.00% |
| **Lending** | 54.67% | 29.33% | 16.00% | 100.00% |
| **Risk Management** | 60.00% | 32.00% | 8.00% | 100.00% |
| **Default risk** | 46.67% | 33.33% | 20.00% | 100.00% |
| **Approaches** | 40.00% | 31.11% | 28.89% | 100.00% |

Source: Researcher survey

Firstly, participants were asked a direct question about the tradeoff the Basel perceived, the majority presented arguments of the two side effects, but at the end come with the conclusion that regulation is worthy for a more stable financial system and clients. Then, analyzing their perspective by categories:

80% stated a positive impact of Basel in banks stability with not neutral objections.

Data collected showed participants perceive a positive impact of Basel in the capital and funding structure of banks with a 65.56%, as shown in the table, by which referring to specific questions results , this is due to that almost all of participants (93%) stated a significant enhancement of the funding structure related to the LCR new ratio , however, 73% of respondents revealed that cost of capital has increased by theory , but it has compensated the benefits to the banks and clients of the industry. Then, almost half of the respondents 53% and 60%, perceived a two-side effect in the balance sheet and the quantity and capital enhancements respectively, however, the other half, highlighted a clear negative impact in the mentioned categories. However, 18.67% of respondent firmly believe that Basel has affected negatively the capital and funding structure of banks appealing to the incremental operating and mobilization cost of capital and clean assets.

Profitability results showed a quasi-equal result, 46.67% of participants agreed that Basel has positively impacted, while 40% believed Basel has decreased the profitability as a reduction in lending.

54.76% of participants believed Basel has significantly affected the bank's lending, however, findings revealed its observations perceived no impact in the lending costs, indeed 73% affirmed Basel enhanced lending behavior in terms of caution and credit assessments. Furthermore, respondents had a clear affirmation of the negative impact of Basel (53%) appealing that it notably reduces the project financing capacity of banks in developing countries, finally, 67% of participants agreed of the higher negative impact of credit ratings in the lending of banks in developing countries.

Results show that Basel had a significant positive impact in risk management practices as 60% of participants affirmed, as they have a more risk averse profile conducting them to hold less risky assets and the implementation of the stress testing was a favorable tool for them, however, 32% of respondents appealed a negative effect in risk management.

Regarding the impact in the default risk results do not show significant differences, as 47% of them agreed it has decreased their probability of default and, 33% believed Basel incentive them to take more risky decisions.

Finally, participants partially agreed and disagreed in the positive effects of a proportionality approach of Basel, as 53% stated it cannot be worthy as the principal aimed of Basel is having a less complicated global approach. However, 47% of all respondents agreed that the financial volatility factor in Basel can have more than a positive impact in the banks, all in all they 40% of respondents affirmed that the approaches of Basel had a positive impact in banks.

## 4.3 Descriptive analysis of interviews

Table 3 Descriptive results from interviews

| Participants | More positive | More negative | Neutral |
|---|---|---|---|
| Asset Manager (Bank in developed country) | -Reduction of risks of default, as the transparency provided to clients outweighs some costs incurred by banks.<br>-Banks are more risk averse, hence, safer and less risky<br>- Financing has increased<br>-Systemic risk is effectively addressed | -Increase in the cost of capital, as more efforts for its mobilization.<br>-Affect the financing, mainly mortgages<br>-Affects banks at a compliance level (more scrutiny of origin of capital and assets) | -There is always a tradeoff |
| Wealth Manager (Bank in developed country) | -Banks invest more in sustainable products.<br>-Less illiquidity and dependence of credit.<br>-Profits of banks become more sustainable | -Affects differently banks in developed and developing countries | -Consequence still unclear due to short time period post implementation.<br>-It's difficult to analyze only one regulation isolated, since there is a growing framework off regulations |
| Investment Head Scotiabank (Banks in developing country) | - | -Mainly sectors affected are wealth and asset management segments | |
| Private banker (Bank in developing country) | - | -Capital is not working, instead they are like guarantees or insurance | -All banking sectors are equally affected |

| | | | |
|---|---|---|---|
| | | -Increments in the cost of capital<br>-Reduces prices competitiveness for clients | |

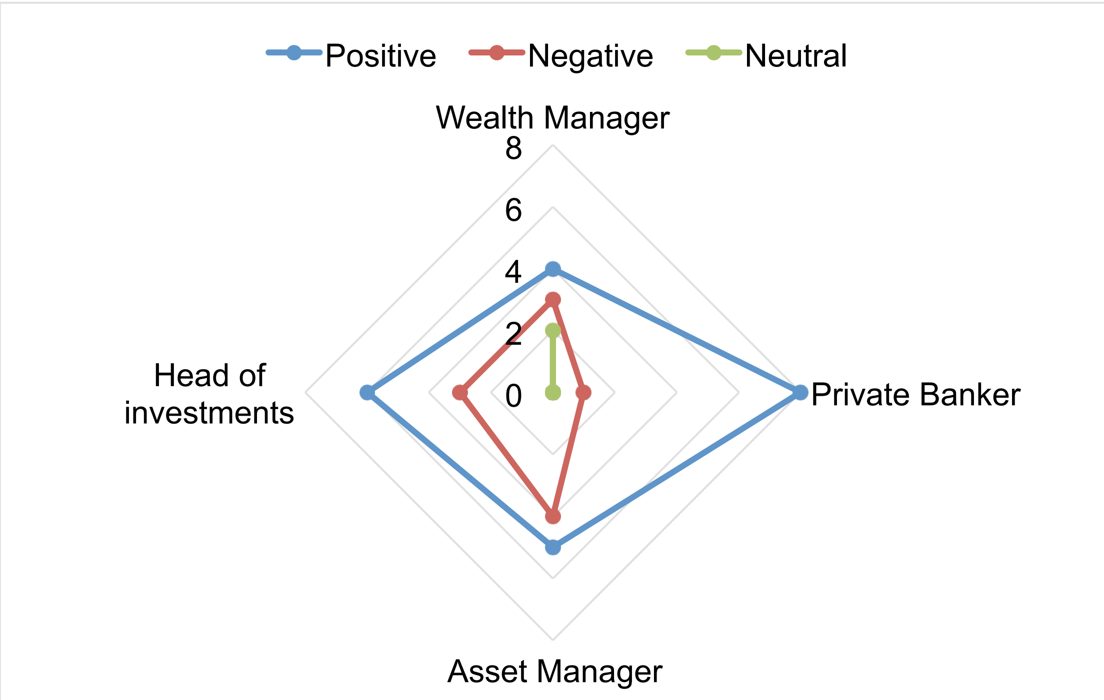
Source: Interviews

### 4.3.1 Quantitative result of interviews

The 9 interview questions were aligned with the 6 categories approached in the interviews being: Stability, Capital and funding, profitability, lending, risk management and default, coming with the following results**.** See appendix 4 for matrix of interview results

Results show that interviewees working in banks from developing countries perceive a stronger positive impact of Basel Regulations than participants from developed countries.

Figure 2 Interview map results




Source: Interviews

## 4.4 Hypothesis testing

To assess the results, the null hypothesis is that Basel III will have negative impact in banks from developed or developing countries. The hypothesis is formulated based on the research question, “What is the impact of Basel III implementation in banks from developed and developing countries?”

**$H_0$: μ=0:** Basel III implementation have not a positive impact in banks from developing and developed countries

**$H_{A:}$ μ≠ 0** Basel III implementation have a positive impact in banks from developing countries

To assess the biases, we compromise the test statistic ± 2 at 95% confidence interval. Hence;

| | | | | |
|---|---|---|---|---|
| **Null Hypothesis** | **$H_0$:** | **μ=0** | Test at 5% SL | σ= 95% CL |
| **Alternative Hypothesis** | **$H_A$:** | **μ≠0** | Test at 5% SL | σ= 95% CL |

Where **μ=0** represents a negative response from interview and questionnaire responses.

Positive response

Positive portion: 209/ 320= 66%

Negative response:

- Negative portion: 111/ 320 = 35%

The hypothesis testing compromised two types of error:

Type I error, that rejects the null hypothesis when it is true, referred as a false positive result of conclusion

Type II error considered as a non-rejection of null hypothesis when the alternate hypothesis is true

Therefore, this assumptions in the hypothesis has to be assessed as well with a regression analysis, using the standardized residuals(errors) or standard error of the mean, which would display the relationship between the mean, standard deviation, number of observers (questions asked).

Table 4 Statistic Data

| | Mean | Std. Deviation | Grading sample N |
|---|---|---|---|
| Positive | 0.58 | 0.2271 | 360 |
| Negative | 0.31 | 0.2462 | 360 |
| Neutral | 0.11 | 0.1385 | 360 |

Source: Researcher survey

**Analysis of Pearson correlation**

In order to explain the interdependence or dependence of values from one to another, it is essential the incorporation of the co-linear model that will be incorporated to the regression analysis for future prediction. However, in this case the co-linearity is not necessary as the two variables are dependent to each other.

Table 5 Analysis of correlation and variance

| Statistical Regression Analysis | | Positive Impact Base III | Negative Impact Basel III | Neutral |
|---|---|---|---|---|
| Correlations | Stability | 0.33 | -0.07 | -0.32 |
| | Capital and funding | 0.44 | -0.25 | -0.31 |
| | Profitability | -0.17 | 0.23 | -0.07 |
| | Lending | 0.37 | -0.08 | -0.09 |
| | Risk Management | -0.14 | 0.33 | -0.37 |
| | Default Risk | 0.20 | -0.13 | -0.09 |
| | Approaches | 0.20 | 0.14 | -0.36 |
| Co-variance | Wealth, Asset, Investment Managers form developed and developing banks | 0.13 | 0.25 | -0.13 |

Source: Researcher survey and interview results

Based on the table, Basel III positive impact has positive correlation with stability, capital and funding and lending, then those segments would have benefited of the regulations at a moderate degree according to expert's perspective. From the other side, results show that Basel negative impact has a negative correlation with those segments, therefore, its low degrees, reveal that Basel III has impacted them negatively in very low degree.

However, in a lower degree Basel had a positive impact in the reduction of default probability of banks in developed and developing countries. Then, the approaches of the Basel III like volatility and proportionality have had beneficial and detrimental effects in the banks at a low degree.

Then, profitability and risk management show a negative correlation, meaning that Basel III had not a positive impact in those two categories mentioned, instead, Basel has impacted them negatively in a moderate to low degree.[36]

Finally results from the interview to experts reveal that Basel, showed that the perspective from the experts have higher relationship with the perspective of a negative impact of Basel Regulations, than with the positive ones.

Consequently, a regression analysis has been conducted to test the Null Hypothesis: The Basel III has not a positive impact in banks from developing and developed countries.

Also, the least squares method was used to ascertain the accuracy of the hypothesis test prediction as showed in the following findings

Table 6 Hypothesis test values

| | St.dev. | Std. Error | Beta | T- Critical | Sig. | Tolerance | Comment |
|---|---|---|---|---|---|---|---|
| Positive | 0.23 | 0.0120 | 1 | 1.96 | 0.05 | 0.45 | OK |
| Negative | 0.25 | 0.0130 | 1 | 1.96 | 0.05 | 0.48 | OK |
| Neutral | 0.14 | 0.0073 | 1 | 1.96 | 0.05 | 0.27 | OK |

Source: Researcher survey and interview results

**Analysis**

[36] Criteria based on Statistic Solutions (2020)

- Standard error (SE) was used to measure the deviations above measures the variability of the test findings results,
- T-critical values were ascertained at 95 percent confidence level, 5% level of significance
- The $\mathbf{R^2}$ (the goodness of fit on the regression analysis) was used as the coefficient of determination to assess the accuracy of my prediction on the hypothesis testing

Table 7 Validity of research prediction using $R^2$ regression

| | | |
|---|---|---|
| $H_0$: | μ=0 | 65% |
| $H_1$: | μ≠0 | 35% |

| Hypo. Test | | | | | | T- test Critical values | | | | Type Error I&II |
|---|---|---|---|---|---|---|---|---|---|---|
| | *p* | $R^2$ | $R^2$-*Adj.* | SE | $R^2$ Change | T-test | df 1 | df 2 | Sig. Level Change | |
| H0: | 0.0139 | 0.77 | 0.7523 | 3.2332 | 0.0177 | 2.809 | 14 | 14 | 0 | Non |
| HA: | 0.0139 | 0.77 | 0 | 0.15 | 0 | 2.809 | 14 | 14 | 0 | Non |

Source: Researcher survey and interview results

**Analysis of results**

The results of the R-squared is 0.77, which confirm that the prediction model can be 77% accurate.

As the T-test results considering the results from the survey, shows that the null hypothesis will be rejected at the mean of 65%, thus the implementation of the Basel III implementation has a positive impact in banks from developing countries, with 95% confidence level.

The t-statistic of 2.8089 goes under the rejection zone limited of by the critical values of + - 2.14, hence, we reject of the null hypothesis of the two-tailed T-test.

## 5 Conclusions, Limitations, and Recommendations

This paper had a main research question being “Has Basel III implementation had a positive impact in banks from developing and developed countries?”. Thus, to account the impact we obtained experts perspective from interviews and surveys to resolve the hypothesis predicted of a positive scenario impact of Basel III, where increased regulation was beneficial for the banks in terms of stability, lending, profitability, risk management practices, default risk probability and approaches of Basel itself.

Therefore, results from the survey showed that experts from both banks in developed and developing countries had a beneficial perspective of the Basel III.

### 5.1 Conclusions

As Luxembourg (2016) and the report of the BCBS (2021) showed a significant decrease in banks RoE, due primarily to the higher funding requirements and profitability streams that were limited to the low risk return assets, our findings support partially this as experts perceive both, an increment of the RoE despite the low interest environment as well as a decrease in the profitability levels relating them to the higher risk measures in their lending practices.

Many authors appeal to the tradeoff between increased regulations and the incremental costs of capital mobilization, however, our findings show that the benefits would significantly overweight the balance, hence, stability was recognized as one the main enhancements with 90% of the interviewees sustaining, this, stable banks would not only have less risky business models, but, clients all over the world would also perceive more safety for investment and deposits. This would comply with the findings of Dagher (2020) who concluded that banks in advance economies increasing their RWA, have also perceived higher levels of stability.

Accordingly, some people argue that higher proportion of equity would reduce banks capacity of lending and deposit activities. Hence, our results in the matrix of correlations showed a strong relationship between the negative impact in the lending provisions. Indeed, despite Luxembourg (2016) appeal primarily to the increase in the lending cost, our experts appealed that actually banks have increasing their lending provisions to overcome with higher revenue stream, but it has affected to some extent the financing.

This negative relationship between lending and Basel III, was explained significantly by the decrease of the project financing capacity of banks, creating a funding gap to developing countries. This is confirmed by the empirical studies of Sami Ben and Caroline Roulet (2017), showing that European and American banks had reinforced its risk absorption capacities in credit activities resolved with sustainable lending behavior and decisions.

Moreover, since the GFC banks have been in the eye of regulators preventing them from taking higher risk that can put systematically affect all the financial system again. Therefore, the increments in capital would have a positive relationship with the risk management practices in banks in developed and developing countries. Despite the RWA framework in capital and the liquidity measures like the NSFR and the LCR tightening the quantity of assets managed, banks have become more risk averse, therefore, our findings reveal that this measure have notably increased bank's balance sheets exposures, however, our survey also found that 47% believed banks would still attach to their main objective, being, the maximization of returns, hence, no significant changes in the risk and hedging practices.

Although the results showed that the profitability might have been affected by the Basel III implementation, there is still a large discussion about the elements driving to them, our findings revealed that there banks appeal to the increasing control of central banks and the low interest rate environment as detriment factors of the net interest margin of banks, however, there can be counterparty effect , as Olga Gouveia in the BVVA article (2021) affirms this controversial context would reduce the bank financing costs as well as  the default rate of payment of households and companies. Finally, this is confirmed by the Stattin (2018), confirming that the interest rate is positively correlated to the profitability and business cycle fluctuations.

This paper also wanted to have a perspective between the hypothetical differential higher impact in banks from developing countries rather than developed countries. Therefore, some authors affirm that developing countries were selective towards the adoption of the Basel III and triggered in the political reluctance of its implementation. Our findings reveal that Basel III should adopt more adjustments to the "weak" financial economies with sociopolitical problems affecting a proper implementation, highlighting the significant competitive advantage in banks from developed above developing countries due to their facility of access to capital and robust financial market environment. However, there is still a lack of relevant findings about the impact of Basel III in small economies and developing countries.

Moreover ,our findings reveal that 67% of the interviewees perceived a decrease of the default risk probability of banks, then, even if banks have increased their costs of capital mobilization and credit costs, the implementation of the stress testing tool for risk management in variable scenarios is considered one of the main beneficial tool for banks, however, its effective use by banks might be in danger as the findings claim about the high costs of implementation as the principal tradeoff.

Bankers from developed and develop countries, state that banks have notably become more aware of their strategies in the market, however, as XX affirms, banks would also increase their risk in order to fulfill the shortages of income and profitability streams.

Also, since profitability of the banking sector is highly dependent of the business cycles, a financial volatile factor is considered a great tool for banks to assess their risk, otherwise fixed measures would affect the profitability and capital burdens of banks in less risky periods. As mentioned, profitability of banks related to the Basel III, should need further study considering the stress testing scenarios with a scope at a country level.

## 5.2 Limitations

The high complexity of the Basel III implications might need longer periods to assess a more significant impact, then, since banks are institutions that are highly regulated nowadays, not only by the Basel III, but for country specific regulations as well, there is more difficulties in the indagation of conglomerates of banks.

Evaluating the impact of specifically the Basel III, needed an extensive and high tailored target of interviewees in the banking sector, then reducing the sample of study for the regression model.

Finally, the model eventually could not consider external economic cycles like the Greek Financial Crisis and others, that might have influenced differently the adaptation of the Basel III by different countries.

## 5.3 Recommendations

As we referenced previously, our model is limited to the findings of experts from 3 nations only considering two banks from developed and one from developing country, hence

There is still a gap in the connotation of the theory that banks from developed countries might have a more beneficial position as the implementation of Basel III, above bank in developed countries. Our model has a level of $R^2$ of 77% dependent of the information from these 15 experts, which shows that the model might not have a large fit considering higher individuals in the sampling.

Therefore, it would be interesting to see analysis off the impact of increased baking regulation in the project financing in developing countries.

In addition, the data analysis showed that Basel have significantly changed their asset management practices, thus, I would recommend further research in the change of asset mix of banks post-implementation of the Basel Regulation or other banking measures, developing a cross country evaluation with a model that could include externalities as well.

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# 7 Appendices

## Appendix 1 Questionnaire

**Questionnaire**

**Impact of implementation of Basel Accords: Insights in some banks from banks from developed and developing countries**

*My name is Karla Jara, a bachelor in International Finance at Geneva Business School, Switzerland and I am currently conducting a research to analyze the impact of Basel Accords implementation in financial institutions from Switzerland and Peru under the supervision of Dr. Victor Yerris, Head of investments concepts, Citibank (Switzerland) AG, Zurich.*

*You are invited to participate in this research, which involves a 27 questions questionnaire and I would appreciate* ***if you can help me by responding to below questions. Your help will be highly appreciated and wish to thank you in advance.***
*Further you should decide to help me, I will be emailing you with a small report relating to the findings of as established in this research.*
*In this context, I kindly ask you to spend some minutes and answer the following questions. You may send the filled questionnaire to my private mail: kromero@gbsge.com by the end of this week.*

**Personal Information**

1) Are you an investor?
( )Yes ( )No

2) Are you a bank employee?
( )Yes ( )No

3) Which bank and which specific sector you work at?

**General Basel III Impact**

4) Are you concerned about the tradeoff of the Basel Accord implementation for banks?
( )Yes ( )No

5) Do you think Basel Accords has impacted the stability of banks? Please explain how it has impacted and whether the impact was positive or negative
______________________________
______________________________
______________________________

6) Do you believe that developed countries have a competitive advantage in the implementation of Basel Regulations rather than developing countries? If yes, can you specify in which terms?
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______________________________
______________________________

8) Do you think that the cost of implementing Basel Regulations might not be justified, in banks whose financial turnover may not allow them to follow the required ratios from the regulations?
______________________________
______________________________
______________________________

9) Do you think regulators should apply a "proportionality approach" to adapt regulations in regions with similar financial systems? Please justify

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10) Do you believe regulators should implement a "financial volatility factor" to developing countries with high sensitivity to sociopolitical factors, procyclical fiscal policy and commodity prices changes?

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**Specific bank related**

11) Do you think Basel Accords has strengthened banks' balance sheets? Please specify to which level: "Low, medium or high" then explain

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_______________________________________________
_______________________________________________

12) Do you think Basel Accords requiring higher capital requirements, has impact positively or negatively the capital pool?

_______________________________________________
_______________________________________________
_______________________________________________

13) Do you think the implementation of Basel Accords has changed the capital funding structure of banks? Please explain whether you consider the impact is positive or negative for the banks

_______________________________________________
_______________________________________________
_______________________________________________

14) Do you think the implementation of higher capital required by the Basel Accords has impacted bank's cost of capital? How has it impacted? Please explain whether you consider the impact is positive or negative for the banks

_______________________________________________
_______________________________________________
_______________________________________________

15) Do you think the implementation of the LCR (Liquidity coverage ratio) from the Basel Accords, implying banks to switch towards high liquidity assets, has impacted banks? If there is an impact, please explain if it is positive or negative and explain.

- [ ] Increase the holdings of high-quality securities holding
- [ ] Decrease the holdings of high-quality securities holding
- [ ] Preference towards Long term funding
- [ ] Preference toward short term funding
- [ ] Preference toward higher liquidity assets
- [ ] Preference toward lower liquidity assets
- [ ] Others

_______________________________________________
_______________________________________________
_______________________________________________

16) How do you think Basel Accords have impacted the profitability levels in terms of RoE of banks? Has it been positive or negative?

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17) How has been the impact of Basel Accords in the lending provisions of the banks? Please explain, whether you consider the impact was positive or negative?

[ ] Increase
[ ] Decrease
[ ] No significant change

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18) Select from the followings, which do you think has been the impact of Basel Accords in the lending behavior of banks? Please explain in detail whether it has been a positive or negative impact

[ ] Implementation of higher credit risk credit assessment
[ ] Change in financing terms
[ ] Preference towards low risk clients(corporates) than households
[ ] Other

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19) Do you think the implementation of Basel Accords have switched the risk aversion profile of banks? Please explain if the impact is positive or negative for the banks

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20) How do you think Basel Accords implementation have impacted risk management and hedging practices in banks? Do you think it is a positive or negative impact for the banks?

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21) Do you believe that after the Basel Accords implementations, banks have switched towards less risky and complex securities, structured products? If yes, please explain whether it has been a positive of negative impact for the banks

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22) Regarding the risk assessments, do you think the "Internal Risk Approach", can be significantly more challenging for banks than the "Standardized model"? To which extent? Please explain

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23) Do you think that the implementation of "Stress testing" required by the Basel Accords has impacted banks? Do you think the impact is positive or negative?

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Source :Researcher Survey

24) Do you think that Basel Accords have impacted the banks' lending costs? Is it positive or negative?

______________________________________________________________________________

______________________________________________________________________________

25) Do you think Basel regulations have impacted banks' ability for project financing in countries developing countries as banks may be limiting their lending provisions? Please explain

______________________________________________________________________________

______________________________________________________________________________

26) Do you believe Basel Accords implementation has decreased the default risk of banks? Do you consider the impact is positive or negative for the banks?

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______________________________________________________________________________

27) Do you believe banks implementing the Basel Regulations have overcome to higher capital than the amount suited to their bank's structure and business operations? Please explain

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

**Thank you for taking your time to complete this survey ¡**

Appendix 2 Interview questions

**General**

1. Do you consider there is a tradeoff between the benefits and the costs of the Basel Regulation for the banks?

**Stability**

2. How do you think that Basel III has impacted bank's level of stability? Do you think its effects are positive or negative?

**Capital**

3. How do you think that increasing the quantity and the quality of capital from banks required by the Basel Regulations, has impacted the banks? Do you think its effects are positive or negative?
4. Do you think Basel III implementation has increased the cost of capital?
5. Do you think Basel III implementation has changed significantly the balance or funding structure of the banks? Do you think its effects are positive or negative?

**Profitability**

6. Do you think Basel has impacted the profitability levels of the banks? Is it positive or negative? In which terms?

**Lending**

7. How do you think that Basel has impacted the lending provisions in terms of costs, behavior and lending practice of banks? Do you think the effect is positive or negative?

**Risks**

8. ¿Do you think Basel Regulations has impacted the risk management and hedging practices of banks? Do you think the effect is positive or negative?
9. ¿Do you think Basel III implementation has reduced the use of trading assets and complex securitites that are less risky and liquid ? Do you think this implementation is positive or negative for the banks?

Appendix 3 Interview transcripts

1. **Interview 1**

***Question nº1:*** *No, the norms have been built for a reason, it really helps to stabilize the market, there are no costs in the implementation*

***Question nº2:*** *Did affect positively, it reduces the chances of risks of default, so this have been positive news to the banks, there is more pain for banks but more helpful for the users*

***Question nº3:*** *They are selling more sustainable products, and that will be positive for the banks*

***Question nº4:*** *Increased the cost of capital, because they just took it from the past lessons and applied up to date*

***Question nº5:*** *For the European ones, just It affected the structure, they cannot hold more than 40% of debt I guess which is a lot*

***Question nº6:*** *There is a lot of significance in the implication of less probability of default in the profitability of the banks. Minimizes the chance s of failure of default, banks don't do whatever they want, more automatization , less liquidity , lees depend of credit more clear, and transparency to investors It can affect more to advance markets because they have more advance capital markets, but, Both equally because they both are learning from the mistakes.*

***Question nº7:*** *Is the opposite positive, there is increasing amount of debt to the investor, there is not much abusing of the banks like before, to deal with the transactions correctly, then there are a lot off assessments to reduce the failure as well. Banks are more consent regarding their lending provisions in terms of quantity and quality. There is a clear impact for both, clients and the banks; Banks minimizes profit, but gives them more sustainability for profits. Of course an effect within developed and developing countries are not the same, it can affect more countries who have been doing this for a long time, and affect less more the new ones .Like JP Morgan, big banks can just take advantage of being a big identity, then small banks, have to stick to the rule, then they won't have the problems as big banks have already had. We have not seen problems with small bank yet, but the thing is that they are not going to fail.*

***Question nº8:*** *Banks have changed their risk profile and the investments they are willing to do, then they are more risk averse, and, banks are less risky,*

***Question nº9:*** *Not since they have to comply with the regulation.*

### 2. Interview 2

***Question nº1:*** *There is always a tradeoff, meaning less business, then the benefits are affected, in the asset management, anything having to do with financing, mainly mortgages. A bit of bombard in terms of cost of capital with mobilization.*

***Question nº2:*** *Banks are safer definitely, however there has been some costs, with 20 years' experience I have seen a growing regulation in every aspect ,so it's difficult to pinout the impact of only one regulation in every aspect, but from Basel III is essentially financing, In Switzerland , is more difficult for them to lend money, so the less money they lend, hence affect the benefits, then affects the bottom-line*

***Question nº3:*** *Wealth, swiss massive affected business at a compliance level, pushing banks to have more scrutiny in terms of where they come from, and how they were created, it's a constant improve day by day and tension over all the assets that we manage are clean assets.*

***Question nº4:*** *By definition the cost of capital has increased, I am dealing with private clients, then again it has affected mainly the financing, since we have assets deposited.*

***Question nº5:*** *No answer*

***Question nº6:*** *Increased regulation -more profitability. The regulation in financial crises has brought out stability, then capacity to do business with clients, there better bottom-line, hence, yes*

***Question nº7:*** *Lending capacity, I don't think there is decrease in lending it's just that banks had to mobilize much more capital and hence it has the cost for bank, but it has not affected lending , it's the opposite ,past 10 years financing has increased. So, it has reduced the risk of the system but has not stopped banks from lending.*

***Question nº8****: I don't think the risk has not gone down, maybe yes, but not affected lending. Then systematic risk is addressed, its compromised,*

***Question nº9:*** *For example, stress testing might have impacted banks operations, but I don't see any major change to that, I don't know to which extent it has affected*

3. **Interview 3**

***Question nº1:*** *There is notably a tradeoff after the implementation of banking regulations after the GFC, in order to avoid further crisis like the one in 2008*

***Question nº2:*** *Before banks were highly leveraged, notably Basel could increase stability in terms of more security for the clients, however, there is a negative impact as there is no capital working actively, they are like guarantees, insurance, that lower the profitability in a medium level.*

***Question nº3*** *In general more capital and more regulations in terms of its quality has made banks incurred in more pressure, it has lessen the profitability, lending, financing, and asset management, now we have to comply more and more the increasing regulations as years pass by*

***Question nº4*** *There is also an increment in the cost of capital, that reduces competitivity of pricing for bank clients, then lower competitiveness, less business for the banks*

***Question nº5*** *Banks have changed their asset mix, but we cannot appeal to the Basel the responsibility of the impact or change, there is also a low interest rate environment supporting the change and other regulations as well. I perceived a switch towards more liquid instruments but not necessarily cash,* *maybe some with maturity in 48 or 72 hours. I believe that having immediate cash does not work*

***Question nº6*** *I do believe Basel has affected profitability, in terms of lending and cost of capital, then, as banks increase their lending's spreads, there is less. Clients, therefore less revenue stream, and respect to the capital, it is immobilized. However, it also depends of the currency.*

***Question nº7*** *Not only the Basel , but other regulations have like the Finma, have made more expensive for banks the lending , they have to have more collateral , hence assuming higher costs of lending , which would consequently affect the clients as well, as they would receive higher lending spreads. However, for clients it's a good time for taking credit, due to the negative interest rate now. Hence, it's more a topic of the market rather than only the Basel .I think there is not differential impact between banks in developed and developing countries, rather it's about the nature of the bank , whether is a local, or small bank, then, of course banks with bigger capital and lending capacity, can have more facilities for changing dollars ,*

***Question nº8 and 9:*** *It highly depends of each bank, some might have higher costs, also depends of the derivatives, swaps, or treasury of the banks, as well as where they are Heardquarted*

4. **Interview 4**

***Question nº1*** *I believe that through the years we have notably come out with more and more regulations that encounter higher costs for the bank's operations, however, I believe that the benefits of them overpasses the costs, because it enhances the banks safeness for investment of clients*

***Question nº2*** *At some costs, higher levels of capital combined with the liquidity framework, would significantly reduce the probability and severity of banking crisis in the future and gives more sustainability to the banks operations in general*

***Question nº3 and 4****: I do not see the Basel III affecting only the costs of capital, normally by theory it does, right, hence, I would say the costs of mobilization is higher, we have to have bigger quantities as insurance not working.*

***Question nº5*** *Notably banks have become more risk averse, hence, they have modified its asset structure, but I would say it adjust to the bank's strategies and business model*

***Question nº6*** *Banks profitability has not only been affected by the Basel regulations, there is the low interest environment that reduces the income from lending, thus the cycle starts again*

***Question nº7*** *I don't think lending provisions has been reduced solely to the effect of the Basel, it's true that the higher capital requirements have reduced* *the lending provisions capacity of banks, but I would not say an exact number.*

***Question nº8 and nº9*** *Banks are more risk averse definitely, they have to comply with a set of regulations that required having clean assets, maybe there has been also a change in the maturity, looking for the use of bonds and more long-term sustainable funding.*

Appendix 4 Matrix of interview results

| Participant | Positive | Negative | Neutral |
|---|---|---|---|
| Wealth Manager | 4 | 3 | 1 |
| Private Banker | 8 | 1 | 0 |
| Asset Manager | 5 | 4 | 1 |
| Head of investments | 6 | 3 | 0 |

Source : Researcher ‘s Interview

Appendix 5 Data Analysis of questionnaires

| Dimension | Sub-questions | Positive | Negative | Neutral |
|---|---|---|---|---|
| Stability | Stability | 12 | 3 | 0 |
| | Level of stability | 15 | 0 | 0 |
| Capital and funding | Over capital level | 3 | 11 | 1 |
| | Balance sheets | 8 | 7 | 0 |
| | Capital quality and quantity | 9 | 6 | 0 |
| | Cost of capital | 12 | 0 | 3 |
| | Funding structure | 14 | 1 | 0 |
| | LCR | 14 | 0 | 1 |
| Profitability | Profitability levels | 7 | 6 | 2 |
| Lending | Lending provisions | 9 | 4 | 2 |
| | Lending behavior | 11 | 0 | 4 |
| | Lending costs | 11 | 0 | 4 |
| | Project financing | 5 | 9 | 1 |
| | Credit ratings | 5 | 10 | 0 |
| Risk Management | Risk profile | 9 | 4 | 2 |
| | Hedging and risk practices | 8 | 7 | 0 |
| | Less risky assets | 8 | 3 | 4 |
| | IRA | 7 | 8 | 0 |
| | Stress testing | 13 | 2 | 0 |
| | Stress testing challengue | 4 | 11 | 0 |
| Default Risk | Default risk profile | 7 | 5 | 3 |
| Approaches | Financial volatility | 7 | 1 | 7 |
| | Proportionality | 7 | 8 | 0 |
| | Systemic risk | 4 | 5 | 6 |
| Totals | | 209 | 111 | 40 |
| Mean | | 0.5806 | 0.3083 | 0.1111 |
| Standard deviation | | 0.2271 | 0.2462 | 0.1385 |
| Standard error | | 0.0120 | 0.0130 | 0.0073 |

| | |
|---|---|
| Number of questions | 24 |
| Number of participants | 15 |
| Total questions | 360 |

Source: Researchers survey