Research Paper　　　　　　　　　　　　　　　　**Open ⊘ Access**

KPI Selection for Fintech Companies: A Systematic Review of Literature

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ABSTRACT

This article examines Key Performance Indicators (KPIs) in the financial technology (Fintech) sector in light of concerns by the European Central Bank (ECB) articulated in their Supervision Newsletter dated February 15, 2023. The ECB's critique points to the deficiencies of KPIs that are heavily skewed towards financial metrics at the expense of essential aspects like risk assessment, control mechanisms, and company culture.

This research comprehensively assesses the literature on KPI selection in Fintech, describing common patterns, challenges, and potential strategies for crafting and implementing KPIs. It reveals a significant misalignment of KPIs, particularly in the context of risk evaluation. The study finds irregular compensation structures and points out weak punitive measures for excessive risk-taking and compliance violations, underscoring an urgent need for KPI system reform in financial institutions.

The findings suggest that KPIs should reflect financial performance and encompass risk management and organizational behavior, advocating for a unified approach that aligns with international business standards. This resonates with the necessity of fostering international perspectives and stimulating research development by sharing advanced knowledge and practices.

Although the insights are grounded in theoretical analysis, empirical research is suggested to substantiate the findings further. These insights could significantly benefit Fintech professionals, regulatory authorities, and policymakers, encouraging collaborative efforts to develop KPI frameworks that adapt to global industry dynamics and regulatory landscapes. The study contributes to international business discourse by proposing a more transparent and accountable KPI system, which could engender greater consumer and stakeholder trust and promote ethical practices in the global Fintech environment.

Keywords: KPI, Fintech, Risk

I. INTRODUCTION

Industry 4.0, coined as the fourth industrial revolution, embodies the transition from conventional manufacturing to a technologically advanced, data-driven paradigm (Ardito et al., 2019; da Silva et al., 2020; Ribeiro da Silva et al., 2019; Tupa & Steiner, 2019; Vaidya et al., 2018). Against the backdrop of the ECB Supervision Newsletter dated February 15, 2023, which highlights concerns about the undue emphasis on financial metrics over risk management, control, and cultural aspects (European Central Bank, 2023), this transition assumes heightened significance. Industry 4.0 heralds an era where manufacturers harness data to augment efficiency and productivity while technological advancements foster innovative business (Alcácer & Cruz-Machado, 2019; Horváth & Szabó, 2019; Williams, 2021).

However, echoing the ECB's call for more comprehensive metrics, Industry 4.0 also triggers introspection about KPIs. The prevailing trend in financial sectors, including Fintech (Fülöp et al., 2022), leans toward financial performance to the detriment of risk, control, and cultural considerations (European Central Bank, 2023). This imbalance resonates with the shortcomings observed in traditional financial institutions' responses to the rise of Fintech (Armstrong, 2016; Buka et al., 2022; Dhar & Stein, 2016; Khan & Malaika, 2021; Still et al., 2019). Fintech, emblematic of Industry 4.0's transformative potential, encompasses technological innovations in financial services (Allen et al., 2021; Barroso & Laborda, 2022; Bhat et al., 2023; Still et al., 2019). However, the phenomenon that challenges traditional financial institutions' modus operandi also embodies the need for more nuanced and holistic performance metrics in

the evolving financial landscape.

As Industry 4.0 unfolds, the imperative to recalibrate KPIs becomes evident, aligning them more closely with risk, control, and cultural aspects as championed by the ECB. Just as Industry 4.0 represents a shift towards a more interconnected and technologically empowered world (Alcácer & Cruz-Machado, 2019; da Silva et al., 2020), so must the metrics underpinning its evaluation echo this comprehensive vision. In this context, Fintech's ascendance and capacity to redefine financial service delivery exemplify the dual nature of the challenge and opportunity that Industry 4.0 presents (European Commission, 2017). As Industry 4.0 unfolds, institutions must heed the ECB's concerns and reconfigure their KPIs, mirroring the transformation they seek to navigate.

The first question that arises is: What exactly is digitalization? At its core, digitalization employs technology to reshape the internal operations of financial institutions, a transformation facilitated by various means, from task automation to more effective data utilization (Barroso & Laborda, 2022; Spence, 2021; Verhoef et al., 2021). The advantages of digitalization are evident; enhanced efficiency and precision empower financial institutions to curtail expenses and enhance customer service. Additionally, digitizing data facilitates informed decision-making, providing once inaccessible insights. Of paramount importance, digitalization equips financial institutions to maintain their competitive edge in a rapidly evolving landscape (Ertz & Boily, 2019; Kitsios et al., 2021). Despite the challenges of change, which demands time and resources, the momentum seems to be shifting. As Fintech companies continue pioneering innovative technologies, traditional Financial institutions face mounting pressure to adapt (Alvarenga et al., 2020; Kraus et al., 2021; Romero et al., 2019; Verhoef et al., 2021). Financial institutions are anticipated to progressively adopt advanced technologies to bridge the gap in the years to come.

An escalating trend has recently been discernible: financial institutions increasingly turn to digital solutions to surmount diverse challenges (Barroso & Laborda, 2022). Fintech firms are adept at delivering innovative and cost-efficient solutions to many of these predicaments (Kitsios et al., 2021). Nonetheless, a series of hurdles must be tackled to render Fintech a universally viable solution for all financial institutions. Foremost among these challenges is the absence of standardization across diverse platforms (Nelson & Shaw, 2003; Smart & Creelman, 2013), making it arduous for organizations to make informed decisions when selecting various solutions. Furthermore, an inadequate understanding among decision-makers about Fintech's mechanics and potential benefits necessitates increased education and awareness campaigns to unlock Fintech's full digitalization potential. Addressing security concerns is also paramount. While fintech solutions are often more secure than conventional methods, instances of data breaches have raised concerns, highlighting the need for enhanced security protocols to safeguard financial institutions and their patrons (Amundrud et al., 2017; Hon & Millard, 2018; Varga et al., 2021).

Ultimately, fintech digitalization holds the promise of myriad benefits for financial institutions. However, these advantages can only materialize if the obstacles confronting these institutions are effectively addressed—only then can Fintech truly revolutionize the operational landscape of financial institutions (Barroso & Laborda, 2022; Dospinescu et al., 2021; Fülöp et al., 2022; Murinde et al., 2022; Popova, 2021).

The rapid pace of digitalization has left financial institutions grappling to keep up, while Fintech companies have swiftly embraced novel technologies, offering inventive solutions to customers. Nevertheless, Fintech encounters distinct challenges in their pursuit of digitalization:

•   The demand for constant online accessibility to meet customer expectations poses a hurdle, especially for Fintech entities lacking resources and infrastructure comparable to traditional financial institutions (Popova & Cernisevs, 2023).

•   Additionally, Fintech must seamlessly integrate with existing payment systems to facilitate customer transactions, a complex task due to outdated systems ill-equipped for modern digital payments or hesitant to cooperate with Fintech firms (Cernisevs & Popova, 2023; Darolles, 2016).

•   Cybersecurity is paramount, particularly for Fintech entities entrusted with sensitive customer data. These companies must ensure their systems' security and regulatory compliance to thwart breaches (Khan & Malaika, 2021; Ruan, 2019; Scarlat & Ioana-Alexandra, 2011).

•   Moreover, the stringent Anti-Money Laundering (AML) compliance requirements often levied on Fintech companies due to their unique operations pose an additional challenge (Al-Suwaidi & Nobanee, 2020; Faccia et al., 2020).

The evolving business landscape necessitates swift and effective responses to remain competitive. This demands the implementation of pertinent measurements to make well-informed decisions. Fintech is a critical sphere where this holds paramount significance. With apt Key Performance Indicators (KPIs), businesses can gauge their performance against industry benchmarks and pivot strategies to maintain a competitive edge. This data is invaluable for discerning trends and predicting future needs. Accurate

metrics are pivotal in enabling agile responses to emerging events; a lack thereof places companies at a disadvantage compared to those with access to such insightful information. While particularly critical for Fintech, the significance of meticulous measurement extends across all facets of business decision-making in the era of digitalization.

The precise choice of key performance indicators (KPIs) is significant for all enterprises, particularly those operating within the financial technology (Fintech) domain. KPIs are crucial yardsticks for evaluating success and monitoring progress in fintech companies. Consequently, the selection process must be meticulous, accounting for several factors in the decision-making process (Maté et al., 2014; Siedler et al., 2020).

Primarily, a business should factor in the indicators requiring measurement, align them with the company's goals and objectives, and pinpoint areas necessitating improvement or change. Once these aspects are identified, the company can discern the most pertinent KPIs. Equally important is the assessment of available data. Given the diversity in data accessibility across companies, selecting KPIs that align with the data at hand is vital. Additionally, exploring the feasibility of acquiring more precise external data for certain KPIs is advisable. Lastly, the user and purpose of KPI utilization warrant consideration. Diverse personnel within the organization will likely hold varying interests in different facets of the business, necessitating the selection of comprehensible and universally compelling KPIs.

II. METHODOLOGY

The present study focuses on a comprehensive literature analysis to establish a taxonomy for Key Performance Indicator (KPI) selection within Fintech matters. The author contends that this specific domain has not garnered sufficient attention within the purview of scholarly literature. This study formulates the following Research Questions (RQ) to validate or refute this premise:

a. RQ1: Does the scientific literature indexed in Scopus and WoS databases sufficiently cover the domain of KPIs in financial institutions?

b. RQ2: Are the factors influencing the selection of KPIs for financial institutions expounded upon in scholarly articles?

c. RQ3: Does a viable classification of KPIs for financial institutions exist, and is it practically applicable for use within financial institutions?

This methodology aligns with analogous studies conducted across various scientific domains, which often delve into topics less explored by fellow scholars (e.g., Majuri et al., 2018; Pavlyuk, 2019; Popova, 2020).

Drawing inspiration from the methodology outlined by Wee & Banister (Wee & Banister, 2016), the study's preliminary phase entails formulating a research plan elucidating the research's aim, objectives, stages, and pertinent research questions. Formulating an optimal list of keywords emerges as a pivotal task, determining the study's overall efficacy. Subsequently, criteria for the inclusion and exclusion of scientific studies are established.

The research query, conducted between September 2022 and January 2023, revolved around the keywords: "fintech" OR "Financial institutions" AND "KPIs OR metrics". Articles were limited to those available in English, indexed in Scopus and WoS, and accessible in full text. Those that did not align with these criteria were eliminated from consideration. A total of 590 articles satisfying the inclusion criteria were identified.

Further refining the selection, 122 publications were excluded due to duplication, unavailability, or non-conformance. The abstracts of the remaining 468 articles were meticulously screened, leading to the identification of 347 articles deemed irrelevant to the research topic and consequently excluded from subsequent analysis.

Out of the initial pool, 121 articles underwent comprehensive full-text examination, excluding 112 articles deemed incongruent with the study's focus. Consequently, a mere nine articles remained for meticulous scrutiny. After a snowballing process, seven additional articles were incorporated into the study, culminating in 16 articles that underwent qualitative analysis.

With the study's parameters firmly established, the analytical phase commences, as outlined in Figure 1. This procedure was supplemented with further qualitative analysis.
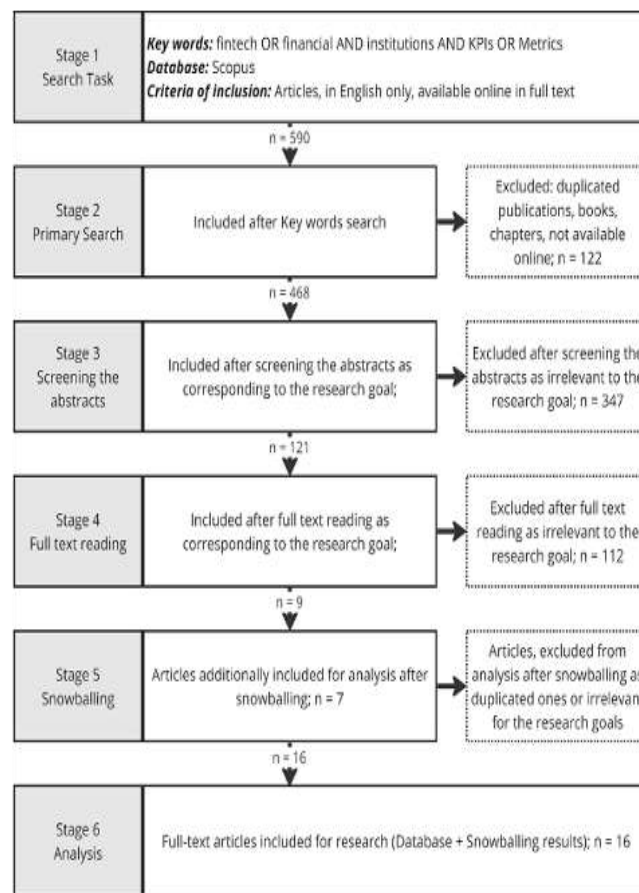
Figure 1: The procedure of selecting the articles for qualitative analysis (generated by the author)

The author employed the following query operators for publication selection: "fintech" OR "Financial institutions" AND "KPIs" OR "metrics". This query was applied to both the titles and abstracts of the publications. The study period spanned from 2006 to 2023; however, no articles before 2006 were discovered within the databases. This observation can likely be attributed to the absence of a need to address KPIs as financial institution metrics before this time.

The inclusion criteria encompassed scientific articles available within the Scopus and Web of Science databases, written in English, and accessible in full text. These articles were scrutinized for their relevance to the research's objectives and the incorporation of the query operators. Articles that did not meet these inclusion criteria were subsequently excluded. The second phase of the study entailed querying the databases between September 2022 and January 2023, utilizing the keywords "fintech" OR "Financial institutions" AND "KPIs" OR "metrics". Detected articles were then arranged chronologically by year of publication to ascertain any discernible trends.

Another aspect examined was the specific area of study to which the selected articles were aligned. This exploration provides insights into the scholarly domains where the issue was deemed pertinent enough to warrant research, illuminating the extent of its exploration. The third stage encompassed a detailed reading of the chosen articles. Through this process, the author gauged the depth of coverage on the topic within the scientific literature.

This analysis aided in identifying research gaps, enabling a focused approach to addressing specific underexplored aspects.

The final phase involved compiling a comprehensive report on the reviewed subject matter, concluding whether existing scientific publications adequately addressed the issue or if certain areas lacked sufficient elaboration, warranting greater attention from scholars. The author predominantly employed a descriptive analysis approach to attain the stipulated objectives.

III.   RESEARCH RESULTS

The identified articles were organized chronologically based on their publication year, offering insights into the evolving trend in problem analysis—the number of published articles accumulated over

time.

Subsequently, the study delved into the sphere of study to which the selected articles belonged. This exploration was crucial for understanding the specific scientific domains wherein scholars perceived the issue to hold promise for research endeavors—such an understanding aids in assessing the depth of exploration. Regrettably, the outcomes were somewhat discouraging. Only two areas exhibited relatively successful identification: liquidity management (two articles) and cybersecurity (three articles). For the remaining articles, distinct categorization within specific areas proved challenging.

The subsequent findings pertained to the qualitative analysis of the chosen articles. The author evaluated the extent of topic elaboration in the scientific literature, facilitating the identification of problematic areas within the subject matter. These outcomes are briefly summarized in Table 1. This table encapsulates the review of each selected article alongside the corresponding research areas relevant to this study, indicating whether these areas were covered or omitted by the respective articles.

Despite the limited number of articles selected as pertinent to this research, it is evident that even these do not contribute to the definitive determination of KPIs for financial institutions.

Table 1. Articles summary (generated by author)

Title	Journal	Positive factors to inclusion	Negative factors to inclusion	Review
Customer Due Diligence in the FinTech Era: A Bibliometric Analysis **William Gaviyau; Athenia Bongani Sibindi 2023**	MDPI - Risks	The article defines financial crime as the risk	Because this article is a bibliographical review, it must correctly assess the financial crime risk.	Based on the anti-money laundering, crime, and financial crime subject, the authors show the heat map of the key phrases or keywords commonly used. These keywords show the relevance and growth from 2012 to 2021. This information reveals the impact and how the subject area is evolving. This research explored contemporary trends in customer due diligence in the age of FinTech, focusing on evaluation methods. From the results, combining CDD with FinTech is a developing domain that necessitates cross-disciplinary teamwork. Owing to technological advancements, the financial realm is susceptible, potentially leading to economic uncertainty and inadequate safeguarding of consumers.
Propension to customer churn in a financial institution: a machine learning approach **Renato Alexandre de Lima Lemos,** **Thiago Christiano Silva** **Benjamin Miranda Tabak 2022**	Neural Computing and Applications	The article discusses the customer churn from the financial institution, which defines some aspects of the strategic risk.	This bibliographical review article does not adequately assess the strategic risk.	According to the World Retail Banking Based on the 2019 World Retail Banking Report, approximately 66.8% of present banking consumers have either utilized or plan to engage with a neo-bank account within the upcoming three years. This paper investigates the behavior of a representative dataset of 500,000 clients of a Brazilian financial institution, aiming to generate a churn predictive model of account holders through machine learning, capable of identifying the variables with a more significant predictive potential of a client's propensity to churn. In addition, the authors leverage the availability of many attributes in the dataset to obtain accurate customer churn predictions and to understand which attributes have the highest predictive power when determining the likelihood of a potential churn. This analysis can offer

				insights into customer behavior, and we can use these insights to develop policies to mitigate customer churn.
Financial Literacy and Financial Inclusion: A Systematic Literature Review Amanjot Kaur **Rajit Verma 2022**	ECS Transactions	The article defines financial literacy and inclusion metrics as part of the governance risk.	The assessment is not comprehensive and discusses only two metrics.	The significance of financial literacy has skyrocketed over the past two decades as financial services have become the fastest-growing sector and the engine of economic growth. To achieve inclusive economic growth, the government and institutions have begun focusing on financial literacy and financial inclusion, resulting in abundant research on the topic. This paper examines all facets of financial literacy and its development alongside financial inclusion. We conducted the study using a keyword search and a comprehensive cluster analysis of seventy research papers. The primary conclusion of this analysis is that we must conduct financial literacy efforts and studies alongside an evaluation of the impact of financial inclusion. To perform a complete analysis, we must examine these metrics together. The study can serve as a resource for researchers and policymakers conducting additional research and evaluating current efforts.
Security and Risk Analysis of Financial Industry Based on the Internet of Things Yizhi Li **2022**	Wireless Communications and Mobile Computing	The article defines the metrics of ICT, which describes the significant risks of cybersecurity.	The article limits its topic only to the Internet of Things.	Yizhi Li reported on security and risk analysis of the financial industry based on the Internet of Things. The same generation of high-end technology, the bank's security system target, and willful against wind crime, customer information stolen, and the loss of funds reduce the bank's credibility. Based on the Internet of Things environment, conduct research and analysis on asset management, monitoring, and measuring risks. Attackers access IoT devices through the Internet, making the IoT vulnerable to malicious attacks from external sites. The current IoT positioning and algorithm models have a long extension period, and the accuracy must be enhanced. The primary purpose of this article is to study the interpretation of the analysis of financial safety and risk under the Internet. There were 39 parameter indicators included in the study.
Using Model Performance to Assess the Representativeness of Data for Model Development and Calibration in Financial Institutions Chamay Kruger, Willem Daniel	MDPI - Risks	The article is a comprehensive research of capital adequacy metrics.	The article does not address the metrics as risks.	This article seeks to devise a technique for gauging representativeness when leveraging external data for regulatory frameworks. Our goal is to evaluate the representativeness of data during both model formulation and its calibration.

Schutte Tanja Verster **2021**				
Beyond profitability: ICT investments and financial institutions performance measures in developing economies Kamla Ali Al-Busaidi, **Saeed Al-Muharrami** **2021**	Emerald - Journal of Enterprise Information Management	The article defines the metrics of ICT, which describes the significant risks of cybersecurity	The article does not address the metrics as risks.	The longitudinal study results provided substantial evidence of the effect of ICT investment on financial performance indicators; the value of ICT is substantially positive. Additionally, the results showed that both business and ICT managers agree that ICT connects to non-financial performance indicators; they link ICT value to the customer, internal process, learning and growth indicators, and sector indicators.
A multilevel analysis of financial institutions' systemic exposure from local and system-wide information Yérali Gandica, Sophie Béreau Jean-Yves Gnabo **2020**	Scientific Reports	The authors try to define metrics for the particular company, and this approach is the reason for including this article in the research result.	The metrics mentioned within the article do not address risk.	The authors report the results for the regular metrics. The rows report the names and the signs of the coefficient of the variables that appear significant in one of the four columns. Higher vulnerability corresponds to smaller cumulative returns and more significant maximum drawdown.
Performance Evaluation of Advanced Machine Learning Algorithms for Network Intrusion Detection System Sharfuddin Khan, E. Sivaraman & Prasad B. Honnavalli **2020**	Proceedings of International Conference on IoT Inclusive Life (ICIIL 2019), NITTTR Chandigarh, India	The article defines the metrics of ICT, which describes the significant cybersecurity risks.	The article does not address the metrics as risks.	Tremendous growth, while malicious attacks on government, corporate, and financial institutions have increased. Intrusion Detection Systems (IDSs) have been developed and adopted by many institutions to monitor intrusion and other malicious activity in response to these attacks. Low detection accuracy, False Negatives (FN), and False Positives (FP) continue to be challenges for these IDSs. (FP). Machine Learning (ML) techniques are employed to address these issues, increasing the accuracy of intrusion detection and significantly reducing false negative and false favorable rates. On the UNSW-NB15 dataset, we evaluated five algorithms, namely Decision Tree (D-tree), Random Forest (RF), Gradient Boosting (GB), AdaBoost (AB), and Gaussian Nave Bayes (GNB). Based on the following metrics: detection accuracy, F1 score, and false positive rate, we discovered that Random Forest is the best classifier.
Performance of Microfinance	MDPI-Social	The article is a	The article does not address the metrics	More explicitly, given the increasing focus of MFIs on commercialization, is there a

Institutions in Ethiopia: Integrating Financial and Social Metrics Solomon Bizuayehu Wassie Hitoshi Kusakari Masahiro Sumimoto 2019	Sciences	comprehensive research of capital adequacy metrics.	as risks.	"mission drift" or re-orientation from their original mission of serving people experiencing poverty in pursuit of commercial viability? Prior studies have analyzed the factors affecting the social and financial performance of MFIs and the social performance of MFIs. In the context of this paper, a firm's success is measured by its effort to attain its organizational goal, in this case, using social and financial metrics.
Network analysis and systemic FX settlement risk José Henry León-Janamp 2017	Statistics & Risk Modeling	This article defines metrics concerning the correspondence bank assessment and liquidity management.	The article does not address the metrics as risks.	The idea of employing network analysis in a foreign exchange (FX) settlement system is being explored. Specifically, network centrality metrics are utilized to evaluate financial institutions' payments that clear through CLS Bank. (CLS). Network centrality metrics provide a method for analyzing settlement member connectivity, determining the evolution of their payments over time, and measuring network topology variability. While the continuous link settlement (CLS) network structure often follows a power law degree distribution on numerous trading days, it's not a consistent pattern. We utilized a community detection algorithm on the FX settlement network to delve into community interactions and pinpoint distinct FX trading net payment classifications trends. SinkRank is used to construct a classification of the most systemic settlement risk-critical financial institutions trading on the FX system and to determine how the metric is affected by network connectivity. Given that network measures don't fully capture the intricacies of the settlement procedure, we simulate the CLS settlement mechanism to gauge the proliferation of unsettled transactions and their distribution across network participants. The effect of settlement failure and contagion on settlement members was also investigated.
A new multi-factor risk model to evaluate funding liquidity risk of banks Jean-Laurent Viviani Malick Fall 2015	The European Journal of Finance	This article defines metrics concerning liquidity management.	The metrics mentioned within the article do not address risk.	This article explores the funding liquidity challenges faced by banks. We introduce a novel multi-factor risk framework, which yields three unique funding liquidity risk indicators derived from the liquidity gap's probabilistic analysis. This approach facilitates insights into the progression of liquidity risk and its correlation with the size of a bank. Our primary objective is to develop the Basel III-proposed monitoring instrument for "the contractual maturity mismatch."
Assessing Systemic Importance With a Fuzzy Logic	Intelligent Systems	Three metrics were selected for	The metrics mentioned within the article do not	Three metrics are designed to evaluate the size, connectedness, and non-substitutability of Colombian financial institutions as the

Inference System Carlos León, Clara Machado, Andrés Murcia **2015**	in Accounting, Finance and Management	the financial institutions.	address risk.	primary determinants of systemic importance: (i) centrality as net borrower in the money market network; (ii) centrality as payments originator in the large-value payment system network; and (iii) asset value of core financial services. An aggregated systemic importance index is calculated using a fuzzy logic inference system and expert knowledge. For comparison purposes, we estimate a benchmark index using principal component analysis. The similarities between the two indexes suggest that the aggregation of expert knowledge is consistent with that based on a strictly quantitative standard approach. Specific non-negligible distinctions are compatible with the nonlinear characteristics of an approach designed to simulate human reasoning. Both indices are complementary and provide a comprehensive relative assessment of each financial institution's systemic significance in the case of Colombia, where the choice of metrics is based on the macroprudential perspective of financial stability.
An Index-Based Measure of Liquidity George Chacko Sanjiv Ranjan Das Rong Fan 2016	SSRN - Elsevier	This article defines metrics concerning liquidity management.	The metrics mentioned within the article do not address risk.	The liquidity shocks of 2008-2009 revealed that the majority of financial institutions' measures of liquidity risk were grossly inadequate. Errors like extraneous risk factors and hedging errors are introduced while constructing long-short portfolios using liquidity proxies. Using exchange-traded funds (ETFs), we devise a new measure for liquidity risk to minimize this error. We develop a theoretically supported measure that is long ETFs and short the underlying components of that ETF, i.e., long and short the same set of underlying securities with the same weights. Liquidity differences between the ETF and its fundamental components cause pricing disparities between long and short positions. To validate our new liquidity metric, the authors constructed theoretically supported liquidity risk factors for several markets and conducted some validation experiments. The author's illiquidity measure is strongly related to other illiquidity measures, explains bond index returns, and reveals a systematic illiquidity component across fixed-income markets, as shown by the results.
Prepayment risk and bank performance Alex Fayman, Ling T. He 2011	Journal of Risk Finance	This article defines metrics for financial institutions concerning risks.		According to the findings of this study, prepayment risk may have a substantial effect on the return on loans, return on equity, and real estate loans to total loan ratios of various commercial banks. Before and after the passage of the Financial Institutions Reform and Recovery Act, the magnitude and direction of the effects differ.

|				The findings indicate that adding a prepayment risk variable to regression models can enhance their ability to explain bank performance metrics.
PERFORMANCE INDICATORS AND EVALUATION FRAMEWORK Shahbaz Khan Muhammad Azeem 2007	The International Journal of Interdisciplinary Social Sciences : Annual Review	This article defines metrics for financial institutions concerning some risks.	The metrics mentioned within the article do not have comprehensive relations to risk systems.	This study investigates comprehensive institutional performance metrics. The study investigated the utility of performance indicators in decision-making using a qualitative paradigm and a literature review methodology. Each of the four metrics and performance indicators categories—inputs, outputs, outcomes, and process—should be included in a performance analysis. Input indicators are easily quantifiable, process indicators include the means to deliver the program, outputs indicators concentrate on the number of outcomes, and outcomes indicators emphasize the quality of the programmer's benefits. A suggested conceptual structure and several guiding tenets focus on performance metrics. The study derives several key insights: firstly, the performance metrics should align with the institution's core objectives and mission; secondly, to ensure effective strategizing, both assessment and evaluation are pivotal, helping gauge our alignment with set goals; and lastly, when crafting policies specific to an institution, performance indicators offer only restricted utility.
Criteria for Performance Excellence T. May **2006**	Materials Performance	This article defines metrics for the governance of financial institutions.	The metrics mentioned within the article do not address risk.	Several characteristics of an effective organizational leader are discussed. In his book Leaders, Warren Bennis identifies four characteristics of outstanding leadership. The four characteristics are vision, which involves imagining a plausible future and devising strategies, communication, trust, and dedication. Leadership is an equilibrium of character, values, integrity, respect for others, bravery, and the ability to share success. Excellence in leadership encompasses both organizational leadership and social responsibility.
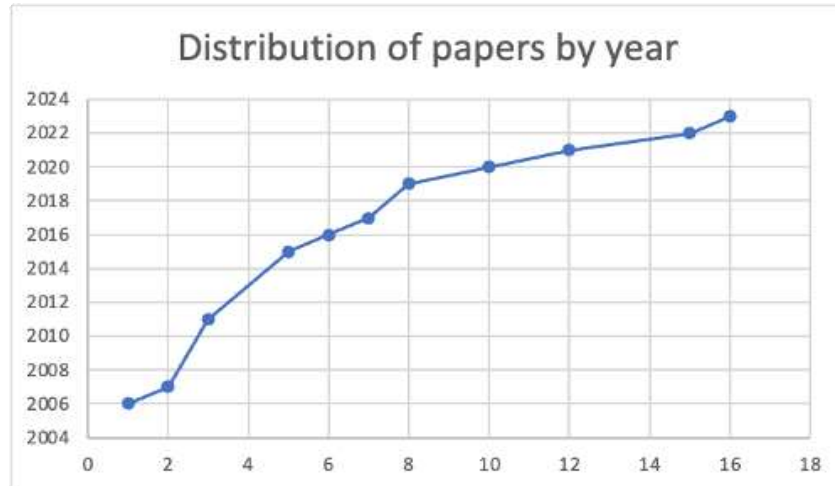
Figure 2: Distribution of papers by years (generated by author)

IV.　DISCUSSION

In analyzing the adaptation of financial entities to the digital economy, it is evident that while Fintech firms have swiftly capitalized on digital opportunities, traditional financial institutions lag, constrained by longstanding infrastructures and archaic Key Performance Indicators (KPIs). Though effective historically, these traditional KPIs, such as Return on Equity (ROE), do not fully capture the digital complexity or the performance trajectory of Fintech enterprises that prioritize growth over short-term profits. Furthermore, the sluggishness in leveraging data-driven operational metrics for strategic decision-making underscores the urgency for a contemporary KPI framework that is pertinent across the financial spectrum.

The literature review reveals an absence of discourse on KPIs specifically designed for the financial sector. Out of 590 potential articles identified, only 16 provided relevant insights, reflecting the Fintech field's infancy and the challenge for academia to keep pace with its rapid evolution. This gap signifies an opportunity for this article to serve as a conduit between theory and practice, fostering international dialogue and collaboration to enrich the understanding of KPIs within the financial sector.

The limited scholarly coverage confirms a vast potential for future research addressing the first research question (RQ1). Similarly, the second research question (RQ2) uncovers a gap, with scant literature on the factors influencing KPI creation, highlighting a need for detailed scholarly examination. The response to the third research question (RQ3) aligns with the preceding findings, indicating an absence of a universally accepted KPI typology.

This discussion underscores the necessity of advancing international business studies by pinpointing a significant lacuna in current financial management research and suggesting a direction for scholarly inquiry. It also highlights the author's, as representative of financial institution management, approach to disseminating research that has practical implications, aiding financial institutions worldwide in refining their KPI strategies to reflect the demands of a globalized digital economy.

V.　RESEARCH LIMITATIONS

The research is subject to certain limitations:

- The database search is predicated on the predefined list of operators (keywords). Alterations to this list would yield different search outcomes.
- While the chosen databases align with conventional practices for this literature review, employing alternative databases could yield divergent results.
- The study's temporal scope concludes with the latest article from 2006. It is plausible that other researchers may consider older articles relevant for similar studies.
- A substantial limitation lies in the qualitative nature of the analysis. The selection of articles is substantially influenced by the author's expertise, knowledge, skills, and perspective. While the author's extensive 26-year tenure in financial institutions, appropriate education, and current position necessitating the resolution of similar issues are considered, individuals with varied backgrounds, experiences, or regional contexts may opt for a different selection of articles.

VI.　CONCLUSION

The scholarly investigation into Fintech's Key Performance Indicators (KPIs) has predominantly

honed in on particular metrics, yielding significant insights into the determinants of Fintech ventures' success or failure. Nonetheless, this narrow concentration may mask additional critical elements impacting Fintech firms' performance. The current scope of research offers valuable understanding but is not exhaustive in capturing the full array of factors that sway the fate of Fintech operations.

This investigation embarked on addressing three Research Questions: RQ1 pertains to the depth of scientific literature on KPIs for financial institutions within Scopus and WoS databases; RQ2 inquires whether the factors influencing the selection of KPIs for financial institutions are discussed; RQ3 asks whether there is a practical and applicable classification of KPIs for financial institutions. A rigorous literature review, filtering an initial 590 articles to 16, concluded that these questions remain insufficiently addressed within the academic realm.

The research identified cybersecurity and liquidity as two primary challenges in the Fintech sector. Cybersecurity is especially critical for Fintech firms that handle sensitive data, where breaches could have severe reputational and legal consequences. Liquidity, however, poses a significant challenge for emerging Fintech startups that lack the capital resources of their more established peers, potentially stunting growth and customer acquisition. Despite these issues, the Fintech sector is expected to thrive, bolstered by continuous innovation and the integration of new technologies.

The core unresolved query is the selection of appropriate KPIs for distinct business scenarios within the Fintech industry. The vital role of research in identifying precise and impactful KPIs is clear, as it enables businesses to make informed strategic decisions. The diverse nature of Fintech businesses makes a one-size-fits-all approach to KPIs impracticable. However, an improved comprehension of KPIs' nature, types, and functions can significantly enhance Fintech performance. While each business will have unique KPIs based on specific goals, a general framework incorporating metrics like customer satisfaction, financial health, operational efficiency, and growth potential is broadly applicable.

Moreover, the European Central Bank's concerns underline the need for KPIs reflecting financial institutions' risk profiles. A more inclusive approach to KPI selection, considering risk factors and aligning with an institution's risk appetite, is imperative. This would ensure that KPIs track performance efficiently and measure the interplay between performance and risk effectively. By tackling these issues, Fintech firms and traditional financial institutions can forge more resilient and reliable strategies for performance measurement, fostering overall stability and success within the industry.

This review calls for expanding research frontiers to include a broader array of KPIs that reflect the diverse and interconnected nature of the global Fintech sector. This article contributes to the commitment to fostering international discourse by highlighting the need for a more comprehensive understanding of KPIs. It encourages the geographical diversity of contributors to enrich the field's collective knowledge. It also underscores the importance of practical applications of this research, advocating for KPI frameworks that not only suit the specific needs of Fintech firms but also align with international business practices and regulatory standards. Through such collaborative and international efforts, the Fintech industry can continue to navigate the complexities of the digital economy and emerge more robust and prepared for future challenges and opportunities.

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