

Akhtar, Quratulain; Nosheen, Safia

Article

The impact of fintech and banks M&A on Acquirer's performance: A strategic win or loss?

Borsa İstanbul Review

Provided in Cooperation with:

Borsa İstanbul Anonim Şirketi, İstanbul

Suggested Citation: Akhtar, Quratulain; Nosheen, Safia (2022) : The impact of fintech and banks M&A on Acquirer's performance: A strategic win or loss?, Borsa İstanbul Review, ISSN 2214-8469, Elsevier, Amsterdam, Vol. 22, Iss. 6, pp. 1195-1208, <https://doi.org/10.1016/j.bir.2022.08.007>

This Version is available at:

<https://hdl.handle.net/10419/340342>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



<https://creativecommons.org/licenses/by-nc-nd/4.0/>

Full Length Article

The impact of fintech and banks M&A on Acquirer's performance: A strategic win or loss?

Quratulain Akhtar*, Safia Nosheen

Hasan Murad School of Management, University of Management and Technology, Pakistan

Received 15 April 2022; revised 13 August 2022; accepted 14 August 2022

Available online 24 August 2022

Abstract

Fintech startups symbolize a radical transformation in the financial industry that provides technology-based financial services. These newly formed business organizations use digital technologies such as computers, the internet, mobile, and data to innovate and facilitate, thus creating tough competition with formal incumbents such as banks. Banks are working on various strategies to deal with these new competitors, one of which is to buy them. So, this study focuses on mergers and acquisitions (M&As) between banks and fintech and the impact on the performance of the acquirers in the period 2010–2020. The paired-sample *t*-test and GMM analysis indicate a significant positive impact of fintech and bank M&As on the operating performance, liquidity, and financial leverage of banks but a negative impact on the market performance of banks in the long run. The study offers guidance for financial institutions, policy makers, and regulators in designing strategies toward new competitors in the market.

Copyright © 2022 Borsa İstanbul Anonim Şirketi. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

JEL classification: G21; G34; O30

Keywords: Banks; Financial leverage; Financial technology; Liquidity; Mergers and acquisitions; Operating performance

1. Introduction

Over the past two decades, digitization has affected many businesses, revolutionized how they perform their work, and introduced a new system of innovation (Hornuf, Klus, Lohwasser, & Schwienbacher, 2020). Recent advancements in the field of information technology and the process of digitization after 1990 have not only built a foundation for the automation of systems but also reorganized financial services, with unique and innovative business models (Puschmann, 2017; Salerno, Sampagnaro, & Verdoliva, 2022). Especially after the financial crisis in 2008, the financial services industry is changing rapidly, because of not only changes in regulatory policies but also the swift development of financial

innovations (Anagnostopoulos, 2018; Gomber, Koch, & Siering, 2017; Hughes, Jagtiani, & Moon, 2022). The most recent period is marked by enormous disruptions in how organizations operate (Stoekli, Dremel, & Uebernickel, 2018). One of those disruptions is the emergence of fintech (financial technology) startups that have revolutionized the ecosystem of financial service providers (Alt, Beck, & Smits, 2018; Jiao, Shahid, Mirza, & Tan, 2021; Palmie, Wincent, Parida, & Caglar, 2020). Fintech startups symbolize a radical transformation of the financial industry by providing technology-based financial services (Fasano & Cappa, 2022; Gimpel, Rau, & Roglinger, 2018; Gozman, Liebenau, & Mangan, 2018). These are newly formed business organizations that employ digital technologies, such as computers, the internet,

* Corresponding author.

E-mail addresses: q.akhtar96@yahoo.com, q.akhtar@uet.edu.pk (Q. Akhtar), Safia.nosheen@umt.edu.pk (S. Nosheen).

Peer review under responsibility of Borsa İstanbul Anonim Şirketi.

artificial intelligence, and big data to implement, facilitate, and innovate financial services (Gomber, Kauffman, Parker, & Weber, 2018; Wang, Xiuping, & Zhang, 2021).

Over the past decade, the number of new fintech firms increased dramatically. According to a KPMG report, as of 2019, fintech investment totaled US\$135.7 billion globally. Using digital technologies, these firms have innovated the products offered by the traditional banking sector in domains such as lending, insurance, asset management, and digital payments/clearing settlement services, creating tough competition with formal incumbents, such as banks (Chiu, 2017; Liu, Li, & Wang, 2020; Murinde, Rizopoulos, & Zachariadis, 2022; Thakor, 2020). Banks have also developed various digital innovations internally, but their performance cannot compare to the digital facilities created by fintech firms in terms of cost, user friendliness, and customer accessibility, forcing banks to re-evaluate their corporate boundaries (Boot, Hoffmann, Laeven, & Ratnovski, 2021; Kohtamaki, Parida, Oghazi, Gebauer, & Baines, 2019). The laggardly behavior by banks related to digital innovation can have profound implications for the banking ecosystem. Thus, most banks are dealing with the technological transformation by forming strategic alliances or purchasing their competitors through mergers and acquisitions (M&As) to achieve long-run growth. M&As remain a common strategic tool for business economic development and transition, which reduces competition, enhances access to capital, and minimizes the tax burden through cross-border subsidiaries (Austin & Dunham, 2022). Following the synergy theory with M&As, businesses accelerate their growth, broaden their product offerings, and gain access to new markets, technologies, and trade secrets. Many collaborations and partnerships are formed to acquire access to external expertise, which significantly contributes to the technological development of businesses (Dranev, Frolova, & Ochirova, 2019). A few M&As have focused on acquiring technology by expanding into a new area; others allow the acquirer to enhance existing areas through existing technology; in technology-driven acquisitions, a large acquirer assimilates the technical advances of small target firms (Kohers & Kohers, 2000). According to a PWC global Findex report, in 2017, more than 82 percent of incumbents (banks) in developed countries believe that they are at risk from fintech startups. They expect to increase partnership/mergers with technological innovators over the next three to five years. By acquiring fintech startups, banks aim to cut costs, enhance business processes, and increase profitability by offering rapid and high-quality services to a more extensive customer base, rather than investing in internal R&D (Chen, You, & Chang, 2021; Cui & Leung, 2020). Various papers have documented that M&As can affect the acquirer's performance both negatively and positively (Ang, Daher, & Ismail, 2019; Kim, Ko, Jun, & Song, 2021). Thus we focus on the impact of fintech and bank M&As on performance by the acquiring bank to determine the outcome of an M&A strategy. Is it a strategic win or a loss?

The study makes several contributions to the literature. First, it contributed to the literature on M&As. One strand of studies asserts that fintech destabilizes the performance of banking

institutions as a whole, yet banks' profitability has risen due to the adoption of fintech (Li, Li, Zhu, Yao, & Casu, 2020; Liu et al., 2021; Zhao, Li, Yu, Chen, & Lee, 2022). However, there is a low number of papers on M&As between fintech and banks. To the best of our knowledge, only a handful of studies have researched M&As in fintech (Austin & Dunham, 2022; Dranev et al., 2019). The two studies available investigate fintech M&As between all types of firms (both financial and nonfinancial). Our study specifically examines M&As between banks and fintech firms, their arch competitors in the financial ecosystem.

Second, previous studies focused on only one or two financial aspects after M&As, the impact of M&As on stock prices, and operating performance. However, there is a dire need to examine the interaction of these emerging industries' (fintech, banks) M&A in different financial aspects to deepen our understanding of M&A strategy. Our research responds to this need by delving into four major financial aspects following M&As: operating performance, improvement in operations after M&As, market performance, shareholder reaction to news about the acquisition of new technology, whether M&As improve debt capacity, and the effect of M&As on liquidity positions. These financial aspects are critical factors behind an M&A strategy, particularly in the banking industry. To our knowledge, no prior studies have performed this deeper financial analysis of banks after their acquisition of a fintech firm. Thus we add depth to the existing literature on the outcome of an M&A strategy by evaluating operating performance, market performance, liquidity, and financial leverage after an M&A in both the short and long run.

Third, our study makes a methodological contribution. In our review of the previous literature on M&As, we find that studies use an event methodology to study the impact on the acquirer's performance. This study is among the few to use a dynamic panel data analysis (generalized method of moments [GMM]) to determine the impact of fintech and banks' M&As on acquirer performance.

Fourth, our research contribute to the large emerging field on fintech startups, particularly the emerging literature on fintech innovation and its impact on the banking industry. Whereas most of the fintech research is exploratory, this study is among the few that empirically investigate the fintech phenomenon (Haddad & Hornuf, 2019; Hu, Ding, Li, Chen, & Yang, 2019; Li, Spigt, & Swinkels, 2017).

Lastly, previous studies investigate the impact of fintech M&As with data on the US. But this study covers a range of developed countries, such as the US, the UK, France, and Canada, to explore the impact of the fintech and bank M&As more broadly.

Our research is based on a secondary source of data; the data on M&A deals were collected from Crunchbase and Future FinTech, and the data on financial indicators come from financial statements, Macrotrends, and Bankregdata. First, we employ a paired-sample *t*-test to determine differences in performance before and after M&As. Second, to determine the statistical relationship between fintech and bank M&As on acquirer performance, we use the GMM estimation technique

because of endogeneity problems. The paired-sample *t*-test and GMM results indicate that fintech and bank M&As have a significantly positive impact on the banks' return on assets, but that the net profit margin (NPM) of the banks decrease after M&As. Banks' market performance increases three years after M&As in the paired-sample *t*-test, but decreased in the GMM analysis over a ten-year sample period. The statistical output implies that M&As have a positive effect on banks' liquidity position and financial leverage in both the *t*-test and GMM results. Additionally, we check the robustness of the results by conducting multiple analyses.

The remainder of the paper is organized as follows. Section 2 discusses previous literature, and Section 3 discusses the methodology and the data as well as explaining the sample, data collection, definition of variables, and estimation techniques. Section 4 outlines the results and offers a discussion about the study. In Section 5, we offer the conclusion, implications, and limitations.

2. Literature review

Recently, because of advancements in financial markets and changing consumer demand, the conventional financial sector has also begun to consider changes in business methods, risk management, and business models (Dratva, 2020; Liu et al., 2020, 2021). Moreover, fintech startups popped up as the most rapidly growing and developed business model for addressing customers problems with innovative and cost-effective products in the financial sector (Gozman et al., 2018; Kou, Akdeniz, Dincer, & Yuksel, 2021). As Puschman (2017) writes, this term was first coined after 1990, but researchers and practitioners started working in this field especially in the decade after the financial crisis in 2008. Zavolokina, Dolata, and Schwabe (2016) described fintech as a marriage between finance and technology, in which young startups based on internet/mobile technologies offer innovative financial services and compete with traditional financial service providers (Gai, Qiu, & Sun, 2018; Li et al., 2020; Ozili, 2018). According to Nguyen, Tran, and Ho (2021) and Najaf, Subramaniam, and Atayah (2022), as fintech grows, it competes with banks and takes a portion of their profits. Over time, various fintech business models in the financial market have emerged (Jung, Dorner, Weinhardt, & Pasmaz, 2018; Lee & Shin, 2018). Liu et al. (2020) discuss six business models: peer-to-peer lending, digital payment, crowdfunding, cryptocurrency, personal finance management, and Robo-Advisors/insurtech. These inescapable digital developments question the foundations of the highly governed financial sector with innovative financial products, thus increasing volatility in the market (Leong, Tan, Xiao, Tan, & Sun, 2017; Zhao et al., 2022).

According to Tao, Su, Naqvi, and Rizvi (2022), fintech has played a dynamic role in defining the environment in the financial and banking sector. Jagtiani and Lemieux (2018), by working in peer-to-peer lending, examine “lending club” data and find that fintech entities played an influential role by reaching areas not served by traditional banking, thus creating

strong competition to existing financial institutions. Katsiampa, McGuinness, Serbera, and Zhao (2022) investigate the impact of fintech on the financial and prudential performance of Chinese banks. They find that fintech startups harm core profit areas in Chinese banking, such as payment, and weaken banks' financial and prudential performance. On the one hand, the banking industry is distressed because of economic cycles; on the other hand, it is affected by financial innovations. Therefore, the banking sector is in dire need of new avenues of growth, such as the blockchain technology for payment clearance (Guo & Liang, 2016; Lee, Li, Yu, & Zhao, 2021). Thus the deep-rooted supremacy of leading companies is at stake, and they need to determine how to strategically benefit from the fintech revolution (Gomber et al., 2018). Many banks address digitization issues by partnering with fintech companies in order to take advantage of novel technology-driven financial services that they offer (Hanafizadeh & Amin, 2022).

Another argument raised is that banks acquire fintech startups in order to eliminate competition in the market. M&As are the traditional way for companies to grow, succeed, and sustain their market environment in a competitive setting but raise the question: Are M&As beneficial? Despite conflicting opinions about the success of M&As, it remains a dominant business strategy that firms use to expand (Shimizu, Hitt, Vaidyanath, & Pisano, 2004). Based on the synergy theory of M&As, Bradley, Desai, and Kim (1983) state that the target and acquirer both achieve a higher value through an M&A than they have otherwise. Synergy enables two or more firms to combine so as to generate more profit and minimize costs, introducing operational, financial, market, and managerial benefits. After M&A, if two firms develop good synergy, they can minimize costs and improve their structure of capital. When two firms become one, their costs are distributed across the large scale of production, reducing the cost for the acquirer. Synergy is created by economies of scale, the involvement of effective management, advancement in technology, and complementary resources (Novialdi & Wardhani, 2019).

2.1. Operating performance

Syukur and Bungkilo (2020) explain that acquisition is a new strategy for demonstrating power and integrity while reducing the focus on performance; they examine post-merger operating performance of firms in Indonesia and find that profitability and leverage decline sharply, as firm liquidity after the merger remains ineffective. Phan, Narayan, Rahman, and Hutabarat (2020) examine the influence of fintech firms on bank performance in Indonesia at 41 different financial institutions. By applying multiple analyses, their study concludes that, based on bank characteristics and global financial crises, fintech startups negatively affect bank performance. Based on accounting measures in services and manufacturing, Aggarwal and Garg (2019) investigate the impact of M&As on the performance of Indian companies in 2007–2012 and find that M&As positively enhance the profitability and liquidity of firms. Jallow, Masazing, and Basit (2017) investigate the impact M&As on the financial performance of firms in the

United Kingdom in 2011 using ROA and net profit margin ratios. Their study uses a paired *t*-test, and, based on convenience sampling, evaluates the performance of firms before and after M&As, concluding that they have a positive impact on ROA, but not the net profit margin (Dixit, 2019). Therefore, based on previous studies, the following two hypothesis can be presented:

Hypothesis 1. *M&As between fintech and banks have a significantly positive impact on the operating performance of acquirer banks in selected developed countries.*

Hypothesis 1a. *M&As between fintech and banks have a significantly positive impact on the returns on assets of acquirer banks in selected developed countries.*

Hypothesis 1b. *M&As between fintech and banks have a significantly positive impact on the net profit margin of acquirer banks in selected developed countries.*

2.2. Market performance

M&A performance is a multidimensional framework that encompasses both aspects of the firm: financial factors in the form of accounting measures and nonfinancial factors in the form of market-based measures (Cui & Leung, 2020). Dranev et al. (2019) research the impact of fintech (internet services, information technology, insurance, financial services) M&As on the stock returns of acquiring companies (any public company) in developed and emerging countries. They investigate abnormal returns of stocks in both the short and long term. Using an event study, they find that fintech M&As have a positive impact on the stock returns of acquiring firms in the short run and a negative impact in the long run. Tao, Liu, Gao, and Xia (2017) evaluate the impact of cross-border M&As on the stock returns of acquiring firms in China using event methodology. Based on signaling theory, they find that the stock market has a positive reaction to M&A announcements. Based on these arguments the second hypothesis can be presented as follow:

Hypothesis 2. *M&As between fintech and banks have a significantly positive impact on the market performance of acquirer banks in selected developed countries.*

2.3. Liquidity

Another consideration in M&A activity by firms is the impact on liquidity, which is crucial for business entities as it is highly significant for smooth daily operations. M&As can affect the liquidity conditions of firms, both negatively and positively (Rashid & Naeem, 2017). Alhenawi and Stilwell (2017) stress that value creation after M&As does not depend solely on the financial standing of the acquire but, more importantly, on the financial strength of the acquirer before M&As. Based on the internal capital market theory, they find

that, M&As have a positive impact on the liquidity position of acquiring firms. Shah and Khan (2017) research post-merger performance in the banking sector and find that the acquirer's cash and cash equivalents significantly decline after mergers. Lipson and Mortal (2007) explore the determinants of liquidity and firm characteristics during a merger and acquisition. They find no difference in the impact of liquidity between diversifying and non-diversifying mergers. Jain, Kashiramka, and Jain (2020) investigate the impact of cross-border mergers on the operating performance of acquirers in India in 2004–2013 with secondary data from the financial statements of acquirer firms. They use 16 ratios in the analysis and find that both new and frequent acquirers experience a sharp decline in their liquidity position after a merger. The next hypothesis can be presented as follow:

Hypothesis 3. *M&As between fintech and banks have a significantly positive impact on the liquidity of acquirer banks in selected developed countries.*

2.4. Financial leverage

Acquisitions have an explicit influence on the acquirer's capital-raising activities, and one of the impacts is on the firm's financial leverage (Bianconi & Tan, 2019). Novialdi and Wardhani (2019) explain that the goal of a strategic acquisition by a firm is to maximize its value. Acquirers obtain a competitive advantage by gaining direct access to tried and accepted products in the market, thus decreasing their risk of bankruptcy. Thanos, Papadakis, and Angwin (2020) focus on the financial goals behind the acquisition of a firm in periods with and without macroeconomic waves and find that companies decide to acquire other firms motivated by value maximization and the potential for spreading financial risk through creating synergy in the market (Reddy, Qamar, & Yahanpath, 2019). Mergers enable firms to maximize their value through diversification, further increasing opportunities for expanding their financial leverage. The acquirer creates room for more debt financing by diversifying the business after the merger, thus increasing the firm's borrowing activities (Kim, Jung, & Cho, 2021). Ang et al. (2019) document that raising the debt limit is profitable for all acquirers, whether overleveraged or undelivered. They benefit from an expansion in debt capacity after a merger, reflected in the stock returns of the companies in the long run. Therefore, M&As can positively influence the financial leverage of a company. The counterargument is that the negative impact of a merger on a firm's debt capacity is due to various other factors, such as agency costs and political risks (Agyei-Boapeah, 2015). Alhenawi and Stilwell (2017) evaluate the US economy's post-merger performance using a stepwise panel regression model and show the negative relationship between mergers and the financial leverage of acquirers. Looking a manufacturing in Pakistan, Rashid and Naeem (2017) document that mergers can increase or decrease financial leverage. They stress that, based on the flow of income, merged firms always have a higher borrowing limit

than both the acquirer and the target firms separately. These discussions lead toward the fourth hypothesis as follow:

Hypothesis 4. *M&As between fintech and banks have a significantly positive impact on the financial leverage of acquirer banks in selected developed countries.*

3. Data and methodology

3.1. Sample selection

Our research is based on developed countries. Fintech is rapidly flourishing in both developed and emerging and less developed economies, but the pace of growth is slower in the latter. In particular, a bank strategy of acquiring fintech through a merger is barely visible in emerging and less developed countries, so in order to examine M&As between fintech and banks we focus on developed countries. The sampling technique we use is nonprobability purposive sampling (Bansal, 2017), and our sample is purposively divided into the categories of M&As in the period 2010–2020. First, we determine the list of countries dealing with fintech based on the World Bank report (2019), and then we divide the list into developed and undeveloped countries in Asia, Europe, sub-Saharan Africa, and the Middle East. As M&A activity occurs in developed countries, we filter the data for developed countries, among which the US, the UK, France, and Canada have the most data related to fintech and bank M&As (KPMG, 2019), so we selected them for study. We used the following criteria in selecting the sample: M&As between banks and fintech in the period 2010–2020, M&A deals that have been completed, and the acquisition is in the financial/banking sector. The details are listed in Table 1.

3.2. Data collection

In order to determine the impact of M&As between fintech and banks on the acquirer's performance, we collected extensive secondary data in three different stages through a broad internet search. As fintech is an emerging industry, data on M&A activity is not easily accessible, nor are M&As occurring on a large scale. In the first stage, we searched all the banks' websites for media announcements about M&A activity between fintech and banks. In this website search, we used the definition of the “Financial Stability Board” to ensure that the target firm is a fintech firm. In the second stage, we examined the fintech directories on Crunchbase and Future FinTech to collect and confirm the information on the fintech firms. These

Table 1
M&A Deals.

Countries	M&A Deals	Source
U.S.	52 Deals	Crunch Base
U.K.	11 Deals	Crunch Base
Canada	11 Deals	Crunch Base
France	07 Deals	Crunch Base
Total	81 Deals	

two databases are often used to determine information about M&As between banks and fintech firms regarding deals, the deal value, the target, the acquirer, and transactions. After ensuring that no M&A activity was missed, we conducted a comprehensive Google search to avoid any errors. In the third stage, we examine the banks' financial statements to analyze the data on financial indicators, operating performance, market performance, liquidity, and financial leverage. Additionally, we searched databases on banks' financial information, such as Macrotrends and Bankregdata, to collect information for the different financial variables.

3.3. Methodological discussion

The study employs two estimation steps. In step 1, we use paired-sample *t*-test statistics at the 5 percent significance level to determine the difference in performance before and after the M&A period. Many analysts, bank managers, and researchers suggest that three years is a sufficient period for determining significant differences in performance, so we use the period (+3, -3) in the study (Rashid & Naeem, 2017). In step 2, we use a panel regression approach to analyze the impact of M&As on different dependent variables. The panel regression analysis consists of cross-sections over a certain period. The sample consists of banks in developed countries over a ten-year period (Dickerson, Gibson, & Tsakalotos, 1997). The analysis starts with the panel of fixed effects, and the results of the Hausman test have also implied to use the fixed effect panel regression. However, even after we used a fixed effect panel regression, the problems of heteroskedasticity and endogeneity—confirmed with the statistical output of the Breusch Pagan and Wald tests—persist. The results of the two tests are in the Appendix.

Then, we perform the first-difference GMM by Arellano and Bond (1991). The first difference, GMM estimation, eliminated the fixed effect by converting the data and addresses the endogeneity problem. However, according to Blundell and Bond (1998), the first-difference estimates might have large sample bias and perform poorly, especially if the sample period is short, and the response variable is persistent. So, we use the one-step system GMM proposed by Blundell and Bond (1998) because it improves the reliability of the results by implying both lagged differences and lagged levels (Jha, 2019). In the statistical models, we employ endogenous and exogenous instruments. In model 1 (operating performance), we use asset quality and financial leverage as endogenous instruments and stock prices and the current ratio as exogenous instruments. In model 2 (net profit margin), we use financial leverage and asset quality as endogenous instruments and the current ratio as an exogenous instrument to achieve statistical results.

Next, in model 3 (market-based performance), we use financial leverage as the endogenous instrument and return on assets as the exogenous instrument to generate results. Then, in model 4 (liquidity position), we use asset quality as the endogenous instrument and the firm's net profit margin and age as exogenous instruments. In model 5, we use the current ratio and asset quality as endogenous instruments and the net profit

margin and stock prices as exogenous instruments. We confirm the validity of the instruments in all five models by conducting the Sargan test (see Table 6). Next, we test the persistence of all five models using unit-root tests, which are in Appendix A3. The results show that there is no unit root in all five models and the variables are stationary at level, depicted models are persistent over time. We use Stata software and E-views to generate the results.

3.4. Definition of variables

3.4.1. Mergers and acquisitions

To investigate the impact of fintech and bank M&As on different financial variables, we create a dummy variable for M&As based on the study's objectives. The dummy variable for M&As has coded as “0” for pre-merger period and “1” for post-merger period (Rashid & Naeem, 2017; Zhang, Wang, Li, Chen, & Wang, 2018). See Table 2 for definitions of the variables.

3.4.2. Operating performance

Operating performance means the firm's economic performance, comprising potential and realized performance based on numbers published in annual reports. The synergy of M&As is well reflected in accounting measures in both the long and short run. Earnings are the primary indicator used to assess company performance. The proxies used to measure operating performance are return on assets (ROA) and the net profit margin (Aggarwal & Garg, 2019; Rashid & Naeem, 2017).

3.4.3. Market-based performance

Market-based performance is the nonfinancial aspect of the organization. The motivation for evaluating market performance is that the organization's ultimate goal is to maximize shareholder wealth. The acquirer's average share price over time is used to measure a firm's market performance (Papadakis & Thanos, 2010).

3.4.4. Liquidity

Liquidity explains the company's cash conditions, showing how much in current assets the firms have to pay for current

liabilities and the company's liquidity position, measured with the current ratio. When the liquidity ratio of the firm is higher, it has a greater the ability to pay for current liabilities out of its current assets. It is susceptible to financial institutions (Rashid & Naeem, 2017; Shah & Khan, 2017).

3.4.5. Financial leverage

The financial leverage of the acquirer company is measured by the debt-to-equity ratio. It gives information about the percentage of debt financing and equity financing that a company uses to finance its assets. A high value of debt to equity means a company uses more debt financing to finance its assets; in other words, a firm has more capacity to borrow from the market (Bianconi & Tan, 2019; Novialdi & Wardhani, 2019).

3.4.6. Asset quality

According to the International Monetary Fund (IMF, 2008), the asset quality of the acquirer is measured with a proxy for the ratio of nonperforming loans (NPLs) to the total amount of loans or the loan to deposit ratio. It is defined as unpaid loans and interest that are not regularly recovered. A bank with a high ratio of NPLs to total loans has lower asset quality, while a bank with a low ratio of NPLs to total loans has higher asset quality (Ezeoha, 2011).

3.5. Econometric estimation models

Based on our study's objectives and the literature review, we develop five GMM models, where i is the firm, j is the country, and t is the time. The study includes variables such as; average stock prices (ASP), return on assets (ROA), net profit margin (NPM), financial leverage (FL), current ratio (CR), asset quality (AQ) and firm size, age as control variables.

Operating Performance:

$$ROA_{ijt} = \beta_o + \alpha_1 M(FT)_{ijt} + \beta_1 FL_{ijt} + \beta_2 AQ_{ijt} + \beta_4 NPM_{ijt} + \beta_5 size_{ijt} + \beta_6 Age_{ijt} + \epsilon_{ijt} \tag{1}$$

$$NPM_{ijt} = \beta_o + \alpha_1 M(FT)_{ijt} + \beta_1 FL_{ijt} + \beta_2 AQ_{ijt} + \beta_4 size_{ijt} + \epsilon_{ijt} \tag{2}$$

Table 2
Definitions of the variables.

Variable	Definition	Sources
Mergers and acquisitions	Mrg (FT) = 0 for pre-merger period, 1 for post-merger period	Zhang et al. (2018)
Operating performance	ROA, Net profit margin	Rashid and Naeem (2017) Aggarwal and Garg (2019)
Market-based performance	Average share price	Rashid and Naeem (2017)
Liquidity	Current ratio	Papadakis and Thanos (2010) Rashid and Naeem (2017) Shah and Khan (2017)
Financial leverage	Total debt/shareholders' equity	Novialdi and Wardhani (2019) Bianconi and Tan (2019)
Asset quality	Nonperforming loans/total loans	Ezeoha (2011)
Size	Natural logarithm of total assets	Talavera, Yin, and Zhang (2018)
Age	Natural logarithm of bank age	Talavera et al. (2018)

Market-based performance:

$$(ASP)_{ijt} = \beta_o + \alpha_1 M(FT)_{ijt} + \beta_1 FL_{ijt} + \beta_2 CR_{ijt} + \beta_4 NPM_{ijt} + \beta_4 size_{ijt} + \beta_4 Age_{ijt} + \epsilon_{ijt} \quad (3)$$

Liquidity

$$CR_{ijt} = \beta_o + \alpha_1 M(FT)_{ijt} + \beta_1 FL_{ijt} + \beta_2 AQ_{ijt} + \beta_4 size_{ijt} + \epsilon_{ijt} \quad (4)$$

Financial Leverage

$$FL_{ijt} = \beta_o + \alpha_1 M(FT)_{ijt} + \beta_1 CR_{ijt} + \beta_2 AQ_{ijt} + \beta_4 size_{ijt} + \epsilon_{ijt} \quad (5)$$

4. Results and discussions

4.1. Descriptive statistics

Table 3 displays the study's descriptive statistics, in which the mean of the variables is greater than their respective standard deviation exhibited under dispersion. In Column 2, the mean of average stock prices (3.41), ROA (1.90), NPM (2.41), FL (8.18), CR (1.18), AQ (0.75), size (11.9), and age (3.67) depicts a pattern of market performance, operating performance, financial leverage, liquidity of banks, and fintech firms acquired. According to the mean, the borrowing capacity of the banks improves the most (8.18), following the market performance, net profit margin, return on assets, and current ratio. Similarly, the common trend of all the banks in the median values is shown in Column 2. In Column 3, the standard deviation of ASP (1.40), ROA (18.8), NPM (1.33), FL (6.64), CR (1.13), and AQ (1.39) have the highest variation in the return on assets (18.8) and financial leverage (6.64) among the variables. The next section explains the paired-sample *t*-test analysis.

4.2. Paired-sample T-test analysis

According to Table 4, the mean value of return on assets for pair 1 is (−0.828), the *t* statistic is −4.55, and the *p*-value is 0.001, which shows that the banks and fintech M&As have a significant impact on the ROA of acquirer banks. ROA increased, with a post-M&A margin of 0.828. The mean value for pair 2 (net profit margin) is 0.67, the *t* statistic is 0.37, and

Table 3
Descriptive statistics.

	Mean	Median	Std Deviation	Sample Size
ASP	3.412298	3.428595	1.406878	592
ROA	1.908393	0.682600	18.80282	592
NPM	2.413861	2.862195	1.336621	592
FL	8.188904	7.954497	6.647934	592
CR	1.184103	0.960000	1.138191	592
AQ	0.753949	0.135502	1.391731	592
SIZE	11.96739	12.79020	3.008718	592
AGE	3.677496	3.784190	1.134064	592

Notes: ASP = average stock prices, ROA = return on assets; NPM = net profit margin; FL = financial leverage; CR = current ratio; AQ = asset quality, Size = total assets, Age = age of the bank.

the *p*-value is 0.709, which shows the insignificant impact of banks and fintech M&As on the net profit margins of acquirer banks. The net profit margin of banks decreased insignificantly in the post-M&A period. Next, the mean value of average stock prices for pair 3 is −16.53, the *t* statistic is −3.58, and the *p*-value is 0.001, demonstrating the significant impact of fintech and banks' M&A on the market performance of acquirer banks. The market performance of banks increased significantly, with a post-M&A margin of 16.53. The mean value of the current ratio for pair 4 is −0.33, the *t* statistic is −5.33, and the *p*-value is 0.001, which shows the significant impact of fintech and bank M&As on the acquirer's liquidity position. The current ratio of banks increased slightly in the post-M&A period. Lastly, the mean value of pair 5 is −0.66, the *t* statistic is −3.20, and the *p*-value is 0.002, which shows the significant impact of fintech and bank M&As on acquirers' financial leverage. Financial leverage increased, with a post-M&A margin of −0.66.

4.3. Findings and discussion

The study's main objective is to determine the impact of fintech and bank M&As on acquirer performance. The one-step system-GMM results are presented in Table 6. In Column 1, fintech and bank M&As have a significantly positive impact on the ROA of the acquirer banks at the 1 percent level of significance, with a coefficient of 0.328. This implies that the bank strategy of acquiring fintech firms improves their operating performance after M&As. This is possible because the banks gain a competitive advantage by acquiring their competitors and thereby obtaining technology-embedded products and achieving economies of scale to stay relevant in the market. These results are consistent with those by Zhang et al. (2018), who investigate the impact of M&As on Chinese pharmaceutical firms and find that M&As have a positive impact on the performance of acquiring firms. However, Trujillo, Morales, Kabarriti, and Anderson (2020) and Dixit (2019) present

Table 4
Paired-sample T-test of fintech and bank mergers & acquisitions.

Explanatory Variables	Mean	Std.Deviation	Std.Error Mean	
Paired Sample Statistics:				
Pre-ROA	1.11	4.21	0.37	
Post-ROA	1.93	3.99	0.35	
Pre-NPM	14.39	13.03	1.18	
Post-NPM	13.72	22.00	2.00	
Pre-ASP	63.84	114.4	10.31	
Post-ASP	80.37	123.6	11.14	
Pre-CR	1.18	0.88	0.08	
Post-CR	1.51	0.95	0.086	
Pre-FL	7.80	6.36	0.57	
Post-FL	8.47	6.33	0.56	
Paired Sample T-Test:				
	Mean	Std. Deviation	T	p-value
Pair1-ROA	−0.828	2.026	−4.55	0.001
Pair2-NPM	0.67	19.65	0.37	0.709
Pair3-ASP	−16.53	47.57	−3.58	0.000
Pair 4-CR	−0.33	0.701	−5.33	0.001
Pair 5-FL	−0.66	2.30	−3.20	0.002

contradictory results about the impact of M&As on the accounting performance of merged firms, finding that the ROA of acquiring firms deteriorates. Next, in model 1, financial leverage has a significantly positive relation to ROA at the 1 percent level of significance, with a coefficient of 0.558, confirming that, after M&As, the debt capacity of banks increases, which boosts sales and asset performance. This notion is confirmed by [Campello \(2006\)](#), who finds that firms with more debt have better product-market performance and more sales. The net profit margin, size of banks, and age also significantly affect ROA.

In the next column, the coefficient of the net profit margin is negative (−5.5), showing that after the fintech and bank M&As the acquiring banks' net profit margins deteriorate. The underlying reason might be that banks are not generating sufficient gains from sales or that sales did not respond as expected after the M&A. [Nicholson, Salaber, and Cao \(2016\)](#) support this notion, looking at Association of Southeast Asian Nations, and find that, after M&As, operating performance declines. However, [Grigorieva and Petrunina \(2015\)](#) find a positive impact of emerging capital on the post-M&A net profit margin.

In model 2, the impact of financial leverage on the net profit margin is negative, showing that, enhancement in debt capacity after the acquisition of a fintech firm has a deteriorating impact on the net profit margin because the increase in financial leverage is related to having more interest payments, taxes, and financial distress ([Dalci, 2018](#)). In Column 3, the fintech and bank M&As has a significantly negative impact on the average stock prices of banks at the 1 percent level of significance, with a coefficient of −0.09. The result shows that the bank strategy to acquire a fintech firm does not improve its market performance over the ten-year sample period. The average stock prices gauge market performance, which is affected by various factors, and the sample period includes the pandemic, during which stocks fell across the board. However, in the paired-sample *t*-test in [Table 4](#), average stock prices of banks show a significant improvement three years after M&As. These results are consistent with those of [Ding, Zhang, and Liu \(2021\)](#), [Dranev et al. \(2019\)](#), and [Carlini, Del Gaudio, Porzio, and Previtali \(2022\)](#), who use the event methodology to study M&As and find a significantly positive impact of M&As on stock returns in the short run and a negative impact of M&As on cumulative abnormal returns in the long run. In contrast, [Cui and Leung \(2020\)](#) examine the long-run performance of M&As in the US and report a significant increase in the stock returns of firms after M&As.

However, in model 3, the coefficient of the current ratio (0.02) is positively related to banks' stock prices. [Batten and Vo \(2014\)](#) document a positive relationship between liquidity and stock returns at firms with higher productivity. The net profit margin (0.003) and size of banks also have a positive relationship with the acquirer's stock price. When the net profit margin rises, shareholders perceive it as a positive signal about firm performance and react to it by buying more stocks ([Berggrun, Cardona, & Lizarzaburu, 2020](#)). Column 4 shows the liquidity position of acquiring banks, with a positive coefficient (0.370), meaning that fintech and bank M&As have a positive impact on

the liquidity performance of banks. The acquirer's liquidity performance improves, showing that the M&A is not financed with current assets, and following the synergy theory, an M&A intended to obtain technology improves acquirer's liquidity position. Next, in model 4, the coefficient of financial leverage (0.10) has a positive relationship with the current ratio. According to synergy theory, two entities that combine can claim to create synergy by maximizing their value and capacity for borrowing from the market. After acquiring the latest competitive technology from the market, a bank improves its borrowing capacity as well as its ability to repay short-term creditors ([Novialdi & Wardhani, 2019](#)). [Aggarwal and Garg \(2019\)](#) document the positive relationship between M&As and the liquidity position of Indian firms. However, [Rashid and Naeem \(2017\)](#), in investigating the impact of M&As on corporate performance in Pakistan, report an insignificantly negative impact of M&As on the current ratio of firms.

In Column 5, the fintech and bank M&As has a significantly positive impact on the financial leverage of banks at 1 the percent level of significance, with a coefficient of (1.34). The notion of increasing financial leverage shows that M&As are financed through borrowing on the market. These results are consistent with those of [Rashid and Naeem \(2017\)](#), that merged firms have a better credit position after a merger than they do individually. The positive value of financial leverage shows that merged firms have more room to borrow from the market because of income stability and synergy. This positive impact mirrors the findings of [Novialdi and Wardhani \(2019\)](#), in studying the financial leverage of cross-border acquisitions firms in Asia, find the increasing effect of M&As on the financial leverage of CBA firms compared to domestic firms. However, in their examination of special purpose acquisition companies, [Kim, Ko, Jun, and Song \(2021\)](#) have worked on find that M&As have an insignificant impact on the leverage of merged firms. In model 5, the coefficient of the current ratio (0.60) has a positive relationship with banks' financial leverage after M&As. According to [Sibilkov \(2009\)](#), when firms have more liquid assets, the amount of capital that a firm can borrow from the market increases because the public debt market can more easily monitor liquid assets, which ultimately enables the firm to expand its debt capacity.

In addition to presenting primitive GMM results, the study has performed robustness checks with the help of paired-sample *t*-tests in [Table 4](#), fixed-panel regression in [Appendix Table A2](#), and difference-GMM analysis in [Table 5](#). The results are in similar directions, as explained in the one-step system GMM in [Table 6](#). The bank and fintech M&As have a significantly positive impact on ROA in all analyses, but the impact on NPM is negatively insignificant in paired-sample *t*-tests and has a negative relation after M&A in system-GMM analysis. Our analyses show that M&As have a negative impact on market performance in the long run. Further, the M&A impact on the acquirer's liquidity position, the values depict a significant positive impact on the acquirer's liquidity position. The financial leverage results also confirm the robustness of our analysis; the financial leverage of acquirers increases significantly after M&As.

Table 5
First-difference GMM analysis of fintech and bank mergers & acquisitions.

Explanatory Variables	ROA (1)	NPM (2)	ASP (3)	C.R. (4)	FL (5)
Fintech Mrg	0.025** (0.032) [0.012]	0.589*** (0.000) [0.137]	-0.12*** (0.000) [0.008]	0.182*** (0.000) [0.002]	0.136*** (0.000) [0.025]
Financial Leverage	-0.203*** (0.000) [0.019]	-0.214*** (0.000) [0.047]	-0.01*** (0.000) [0.001]	0.017*** (0.000) [0.000]	
Asset Quality	0.013 (0.109) [0.008]	0.347*** (0.001) [0.104]		0.284*** (0.000) [0.003]	2.41*** (0.000) [0.081]
Net profit Margin	0.941*** (0.000) [0.012]		0.01*** (0.000) [0.000]		
Current Ratio			0.10*** (0.000) [0.008]		-0.024*** (0.000) [0.002]
Size	-0.876*** (0.000) [0.013]	2.587*** (0.000) [0.240]	-0.17*** (0.000) [0.007]	-0.001 (0.592) [0.002]	0.28*** (0.000) [0.012]
AGE	0.378*** (0.000) [0.061]		0.717*** (0.000) [0.080]		
<i>Prob J-Statistics</i>	0.24	0.32	0.09	0.34	0.36
<i>Deals</i>	81	81	81	81	81
<i>OBS</i>	592	592	592	592	592
<i>N(Banks)</i>	54	54	54	54	54

Note: * significance at 10%, ** significance at 5%, and *** significance at 1%. p-values are in parentheses; error terms are in square brackets.

Table 6
One-step System-GMM analysis of fintech and bank mergers & acquisitions.

Explanatory Variables	ROA (1)	NPM (2)	ASP (3)	C.R. (4)	FL (5)
Fintech Mrg	0.328*** (0.007) [0.121]	-5.591*** (0.005) [1.967]	-0.09*** (0.000) [0.026]	0.370*** (0.000) [0.104]	1.341*** (0.008) [0.503]
Financial Leverage	0.558*** (0.000) [0.111]	-0.352** (0.031) [0.163]	-0.006 (0.249) [0.005]	0.107** (0.002) [0.035]	
Asset Quality	0.099 (0.140) [0.066]	1.170 (0.422) [1.457]		0.015 (0.803) [0.062]	0.205 (0.331) [0.211]
Net Profit Margin	0.833*** (0.000) [0.170]		0.003*** (0.000) [0.000]		
Current Ratio			0.022** (0.032) [0.010]		0.600** (0.048) [0.302]
Size	-0.080** (0.040) [0.038]	-0.682*** (0.002) [0.215]	0.003 (0.389) [0.004]	-0.017 (0.464) [0.023]	-0.010 (0.840) [0.054]
AGE	-0.636*** (0.000) [0.089]		0.033*** (0.007) [0.012]		
<i>AR (1)</i>	0.258	0.001	0.000	0.002	0.000
<i>AR (2)</i>	0.000	0.302	0.001	0.134	0.438
<i>Sargan Test</i>	0.274	0.996	0.210	0.678	0.939
<i>Deals</i>	81	81	81	81	81
<i>OBS</i>	592	592	592	592	592
<i>N (Banks)</i>	54	54	54	54	54

Note: * significance at 10%, ** significance at 5%, and *** significance at 1%. p-values are in parentheses; error terms are in square brackets.

5. Conclusion

The study offers insights into strategic moves by acquirers (banks) to buy their competition. Our empirical analysis shows that the fintech and bank M&As have a significantly positive impact on the ROA of the acquirer banks. This dynamic, positive impact of M&As on banks' ROA is consistent across all analyses in which we employ alternative measurement techniques to deal with the problems of endogeneity and heteroskedasticity. This positive impact can be explained by the competitive advantage achieved by banks through acquiring their competition or obtaining technology-embedded products to stay relevant in the market. The negative impact of fintech and bank M&As on the net profit margin of acquirers can be explained by the fact that banks do not generate sufficient gains from their sales or sales do not respond as expected after M&As. The results of paired-sample *t*-tests indicate that after M&As, the market performance of banks increases in the short run. This explains the initial positive reaction of investors after an announcement of a fintech and bank M&A.

However, the GMM analysis shows that performance deteriorates in the long run, for the following reason: the average stock price gauges market performance, which is affected by various factors, and the sample period includes the pandemic, during which stocks declined across the board. However, three years after M&As, the average stock prices of banks improve significantly. Similarly, fintech and bank M&As have a positive impact on banks' liquidity position. The acquirer's liquidity performance improves, showing that M&As are not financed with current assets, and technology-seeking M&As enhance their liquidity. The empirical results also indicate the positive impact of fintech and bank M&As on the financial leverage of banks. The notion of increasing financial leverage shows that M&As are financed by borrowing from the market, than merged firms have a better credit position after a merger than they do individually. The positive value of financial leverage shows that acquirers gain borrowing capacity because of income stability and synergy.

5.1. Implications

The study has practical implications for managers/owners of banks, fintech firm leaders, and policy makers.

First, the study offers guidance to firm managers regarding proposed policies toward new market competitors. The study gave managers a close-up view of the proposed benefits of M&A in the period of the evolving financial ecosystem. According to the results, the bank's strategic move to acquire fintech posed to impact their operating performance, liquidity, and financial leverage positively, whereas the market performance of the acquirer has affected positively in the short run. To effectively integrate fintech capabilities and keep up with the rapid technological advancements, acquisitions are a feasible option for managers, and banks should be more likely to engage in M&As.

Second, the research has practical implications for the managers of banks regarding rising customer demand for digital financial services. They should swiftly develop strategies to cater to customers' needs to remain relevant in the market in the

long run. In addition to employing M&A strategies, managers should also work aggressively to improve their internal R&D.

The paper has also guides the fintech firm owners about their future growth in the financial industry, M&As can be the viable option for fintech owners. Fintech firms need regulatory cover, and banks need technology; in the future, mergers and alliance can be a win-win situation for both.

Finally, the study recommends that policy makers work on regulatory measures that address new participants in the financial industry. Globally, financial regulators aim to foster access to digital financial services, but how can they protect the interests of incumbents? Depending upon how the regulators want to shape the financial ecosystem, if regulators adopts the strict licensing policy for fintech startups, it would limit their prosperity as individual entities; Therefore, a more alliance-based ecosystem may result from the stringent awarding of banking licenses. As a result, this could have repercussions for the long-term health and stability of established financial institutions.

5.2. Limitations and directions for future research

The study has a few limitations that should be acknowledged before its findings are generalized. First, the study is based on developed countries. Further studies should be conducted on developing and emerging economies to determine whether the results would remain consistent. Second, the study covers only a few post-M&A financial impacts; future research should cover other financial and nonfinancial aspects, such as the impact on employees, managerial ability, customer service, and borrowers. Third, we consider M&As between fintech firms and all kinds of banks; future studies could differentiate among M&As by whether they involve public or private companies.

Declaration of competing interest

No potential conflict of interest was reported by Authors of the study.

Appendix.

Appendix Table A1

Diagnostics Test					
Test Name	Mod.1	Mod.2	Mod.3	Mod.4	Mod.5
Heteroscedasticity Breucsh Pagan Test					
Prob > F	0.000	0.000	0.000	0.000	0.152
Endogeneity Diagnostics (Wald-Test)					
Null Hypothesis = C(n) = 0					
Restriction Terms	Prob > F				Std. Err.
C (1)	0.8800				0.045094
C (2)	0.9971				0.126831
C (3)	0.8839				0.042474
C (4)	0.9971				0.029716
C (5)	0.7126				0.634103
C (6)	0.8839				0.019878
C (7)	0.0023				0.003574
C (8)	0.0023				0.050638

Appendix Table A2
Fixed Effect Panel Regression of Mergers & Acquisitions between Fintech and Banks

Explanatory Variables	ROA (1)	NPM (2)	ASP (3)	CR (4)	FL (5)
Constant	2.029*** (0.002) [0.6395]	11.44 (0.107) [7.096]	1.282*** (0.000) [0.358]	0.462 (0.344) [0.488]	3.632*** (0.007) [1.348]
Fintech Mrg	0.124** (0.016) [0.051]	1.293 (0.277) [1.187]	0.179*** (0.000) [0.042]	0.017 (0.832) [0.081]	-0.468** (0.039) [0.226]
Financial Leverage	-0.213** (0.030) [0.097]	-0.745*** (0.002) [0.239]	0.011 (0.175) [0.008]	-0.047*** (0.004) [0.016]	
Asset Quality	-0.004 (0.877) [0.0279]	-0.568 (0.522) [0.886]		-0.006 (0.920) [0.609]	0.252 (0.136) [0.169]
Size	-0.386*** (0.000) [0.033]	0.757 (0.201) [0.591]	0.078*** (0.000) [0.021]	0.092 ** (0.023) [0.040]	0.421*** (0.000) [0.112]
Current Ratio			-0.017 (0.459) [0.023]		-0.368*** (0.004) [0.126]
Net profit Margin	0.683*** (0.000) [0.035]		0.012*** (0.000) [0.001]		
AGE	0.097 (0.470) [0.134]		0.230** (0.022) [0.100]		
<i>Prob > F</i>	0.000	0.006	0.000	0.013	0.000
<i>Hausman Test:</i>					
<i>Prob > Chi</i>	0.000	0.01	0.005	0.015	0.001
Deals	81	81	81	81	81
OBS	592	592	592	592	592
N(Banks)	54	54	54	54	54

Note: * significance at 10%, ** significance at 5%, and *** significance at 1%. p-values are in parentheses; error terms are in square brackets.

Appendix Table A3
Unit-Root Test

Variables	Mod.1	Mod.2	Mod.3	Mod.4	Mod.5
Levin Lin and Chu: H ₀ : Unit Root (assumes common unit root process)					
ADF& PP: H ₀ : Unit Root (assumes Individual unit root process)					
	<i>Levin Lin and Chu Test at Level</i> <i>Prob > Chi</i>	<i>(ADF) Test at Level</i> <i>Prob > Chi</i>	<i>(PP) Test at Level</i> <i>Prob > Chi</i>		
ROA	0.000	0.000	0.000		
FL	0.000	0.000	0.000		
AQ	0.000	0.000	0.000		
NPM	0.000	0.000	0.000		
CR	0.000	0.000	0.000		
SP	0.000	0.290	0.077		
SIZE	0.04	0.733	0.021		
AGE	0.000	0.000	0.000		

References

Aggarwal, P., & Garg, S. (2019). Impact of mergers and acquisitions on accounting-based performance of acquiring firms in India. *Global Business Review.* , Article 0972150919852009. <https://doi.org/10.1177/0972150919852009>

Agyei-Boapeah, H. (2015). Cross-border acquisitions and financial leverage of UK acquirers. *Accounting Forum*, 39(2), 97–108. <https://doi.org/10.1016/j.accfor.2015.03.002>

Alhenawi, Y., & Stilwell, M. (2017). Value creation and the probability of success in merger and acquisition transactions. *Review of Quantitative Finance and Accounting*, 49(4), 1041–1085. <https://doi.org/10.1007/s11156-017-0616-2>

- Alt, R., Beck, R., & Smits, M. T. (2018). FinTech and the transformation of the financial industry. *Electronic Markets*, 28(3), 235–243. <https://doi.org/10.1007/s12525-018-0310-9>
- Anagnostopoulos, I. (2018). Fintech and regtech: Impact on regulators and banks. *Journal of Economics and Business*, 100, 7–25. <https://doi.org/10.1016/j.jeconbus.2018.07.003>
- Ang, J. S., Daher, M. M., & Ismail, A. K. (2019). How do firms value debt capacity? Evidence from mergers and acquisitions. *Journal of Banking & Finance*, 98, 95–107. <https://doi.org/10.1016/j.jbankfin.2018.10.017>
- Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies*, 58(2), 277–297. <https://doi.org/10.2307/2297968>
- Austin, R. E., & Dunham, L. M. (2022). Do FinTech acquisitions improve the operating performance or risk profiles of acquiring firms? *Journal of Economics and Business*, 106078. <https://doi.org/10.1016/j.jeconbus.2022.106078>
- Bansal, A. (2017). A revelation of employee feelings of alienation during post-mergers and acquisition. *Journal of Organizational Change Management*. <https://doi.org/10.1108/JOCM-06-2016-0122>
- Batten, J. A., & Vo, X. V. (2014). Liquidity and return relationships in an emerging market. *Emerging Markets Finance and Trade*, 50(1), 5–21. <https://doi.org/10.2753/REE1540-496X500101>
- Berggrun, L., Cardona, E., & Lizarzaburu, E. (2020). Firm profitability and expected stock returns: Evidence from Latin America. *Research in International Business and Finance*, 51, Article 101119. <https://doi.org/10.1016/j.ribaf.2019.101119>
- Bianconi, M., & Tan, C. M. (2019). Evaluating the instantaneous and medium-run impact of mergers and acquisitions on firm values. *International Review of Economics & Finance*, 59, 71–87. <https://doi.org/10.1016/j.iref.2018.08.005>
- Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1), 115–143. [https://doi.org/10.1016/S0304-4076\(98\)00009-8](https://doi.org/10.1016/S0304-4076(98)00009-8)
- Boot, A., Hoffmann, P., Laeven, L., & Ratnovski, L. (2021). Fintech: what's old, what's new? *Journal of Financial Stability*, 53, Article 100836. <https://doi.org/10.1016/j.jfs.2020.100836>
- Bradley, M., Desai, A., & Kim, E. H. (1983). The rationale behind interfirm tender offers. *Journal of Financial Economics*, 11, 183–206. [https://doi.org/10.1016/0304-405X\(83\)90010-7](https://doi.org/10.1016/0304-405X(83)90010-7)
- Campello, M. (2006). Debt financing: Does it boost or hurt firm performance in product markets? *Journal of Financial Economics*, 82(1), 135–172. <https://doi.org/10.1016/j.jfineco.2005.04.001>
- Carlini, F., Del Gaudio, B. L., Porzio, C., & Previtali, D. (2022). Banks, FinTech and stock returns. *Finance Research Letters*, 45, Article 102252. <https://doi.org/10.1016/j.frl.2021.102252>
- Chen, X., You, X., & Chang, V. (2021). FinTech and commercial banks' performance in China: A leap forward or survival of the fittest? *Technological Forecasting and Social Change*, 166, Article 120645. <https://doi.org/10.1016/j.techfore.2021.120645>
- Chiu, I. H. (2017). A new era in fintech payment innovations? A perspective from the institutions and regulation of payment systems. *Law, Innovation and Technology*, 9(2), 190–234. <https://doi.org/10.1080/17579961.2017.1377912>
- Cui, H., & Leung, S. C. M. (2020). The long-run performance of acquiring firms in mergers and acquisitions: Does managerial ability matter? *Journal of Contemporary Accounting and Economics*, 16(1), Article 100185. <https://doi.org/10.1016/j.jcae.2020.100185>
- Dalci, I. (2018). Impact of financial leverage on profitability of listed manufacturing firms in China. *Pacific Accounting Review*, 30(4), 410–432. <https://doi.org/10.1108/PAR-01-2018-0008>
- Dickerson, A. P., Gibson, H. D., & Tsakalotos, E. (1997). The impact of acquisitions on company performance: Evidence from a large panel of UK firms. *Oxford Economic Papers*, 49(3), 344–361. RePEc:oup:oxecpp:v:49:y:1997:i:3:p:344-61.
- Ding, Y., Zhang, X., & Liu, Z. (2021). Differences in returns to cross-border M&A in the short and long run: Evidence from Chinese listed firms. *Journal of Asian Economics*, 74, Article 101299. <https://doi.org/10.1016/j.asieco.2021.101299>
- Dixit, B. K. (2019). Operating performance of acquirers after acquisition: Evidence from India. *Journal of Indian Business Research*. <https://doi.org/10.1108/jibr-08-2018-0204>
- Dranev, Y., Frolova, K., & Ochirova, E. (2019). The impact of fintech M&A on stock returns. *Research in International Business and Finance*, 48, 353–364. <https://doi.org/10.1016/j.ribaf.2019.01.012>
- Dratva, R. (2020). Is open banking driving the financial industry towards a true electronic market? *Electronic Markets*, 30(1), 65–67. <https://doi.org/10.1007/s12525-020-00403-w>
- Ezeoha, A. E. (2011). Banking consolidation, credit crisis and asset quality in a fragile banking system. *Journal of Financial Regulation and Compliance*, 19(1), 33–44. <https://doi.org/10.1108/13581981111106158>
- Fasano, F., & Cappa, F. (2022). How do banking fintech services affect SME debt? *Journal of Economics and Business*, 106070. <https://doi.org/10.1016/j.jeconbus.2022.106070>
- Gai, K., Qiu, M., & Sun, X. (2018). A survey on FinTech. *Journal of Network and Computer Applications*, 103, 262–273. <https://doi.org/10.1016/j.jnca.2017.10.011>
- Gimpel, H., Rau, D., & Roglinger, M. (2018). Understanding FinTech startups—a taxonomy of consumer-oriented service offerings. *Electronic Markets*, 28(3), 245–264. <https://doi.org/10.1007/s12525-017-0275-0>
- Gomber, P., Kauffman, R. J., Parker, C., & Weber, B. W. (2018). On the fintech revolution: Interpreting the forces of innovation, disruption, and transformation in financial services. *Journal of Management Information Systems*, 35(1), 220–265. <https://doi.org/10.1080/07421222.2018.1440766>
- Gomber, P., Koch, J. A., & Siering, M. (2017). Digital finance and FinTech: Current research and future research directions. *Journal of Business Economics*, 87(5), 537–580. <https://doi.org/10.1007/s11573-017-0852-x>
- Gozman, D., Liebenau, J., & Mangan, J. (2018). The innovation mechanisms of fintech startups: Insights from SWIFT's innotribe competition. *Journal of Management Information Systems*, 35(1), 145–179. <https://doi.org/10.1080/07421222.2018.1440768>
- Grigorieva, S., & Petrunina, T. (2015). The performance of mergers and acquisitions in emerging capital markets: New angle. *Journal of Management Control*, 26(4), 377–403. <https://doi.org/10.1007/s00187-015-0219-9>
- Guo, Y., & Liang, C. (2016). Blockchain application and outlook in the banking industry. *Financial Innovation*, 2(1), 24. <https://doi.org/10.1186/s40854-016-0034-9>
- Haddad, C., & Hornuf, L. (2019). The emergence of the global fintech market: Economic and technological determinants. *Small Business Economics*, 53(1), 81–105. <https://doi.org/10.1007/s11187-018-9991-x>
- Hanafizadeh, P., & Amin, M. G. (2022). The transformative potential of banking service domains with the emergence of FinTechs. *Journal of Financial Services Marketing*, 1–37. <https://doi.org/10.1057/s41264-022-00161-0>
- Hornuf, L., Klus, M. F., Lohwasser, T. S., & Schwiendbacher, A. (2020). How do banks interact with fintech startups? *Small Business Economics*, 1–22. <https://doi.org/10.1007/s11187-020-00359-3>
- Hu, Z., Ding, S., Li, S., Chen, L., & Yang, S. (2019). Adoption intention of fintech services for bank users: An empirical examination with an extended technology acceptance model. *Symmetry*, 11(3), 340. <https://doi.org/10.3390/sym11030340>
- Hughes, J. P., Jagtiani, J., & Moon, C. G. (2022). Consumer lending efficiency: Commercial banks versus a fintech lender. *Financial Innovation*, 8(1), 1–39. <https://doi.org/10.1186/s40854-021-00326-1>
- Jagtiani, J., & Lemieux, C. (2018). Do fintech lenders penetrate areas that are underserved by traditional banks? *Journal of Economics and Business*, 100, 43–54. <https://doi.org/10.1016/j.jeconbus.2018.03.001>
- Jain, S., Kashiramka, S., & Jain, P. K. (2020). Do frequent acquirers outperform in cross-border acquisitions? A study of Indian companies. *Review of International Business and Strategy*. <https://doi.org/10.1108/RIBS-12-2019-0160>
- Jallow, M. S., Masazing, M., & Basit, A. (2017). The effects of mergers & acquisitions on financial performance: Case study of UK Companies.

- International Journal of Accounting and Business Management*, 5(1), 74–92. [24924/ijabm/2017.04/v5.iss1/74.92](https://doi.org/10.1016/j.ijabm.2017.04/v5.iss1/74.92).
- Jha, C. K. (2019). Financial reforms and corruption: Evidence using GMM estimation. *International Review of Economics & Finance*, 62, 66–78. <https://doi.org/10.1016/j.iref.2019.03.003>
- Jiao, Z., Shahid, M. S., Mirza, N., & Tan, Z. (2021). Should the fourth industrial revolution be widespread or confined geographically? A country-level analysis of fintech economies. *Technological Forecasting and Social Change*, 163, Article 120442. <https://doi.org/10.1016/j.techfore.2020.120442>
- Jung, D., Dorner, V., Weinhardt, C., & Puzmaz, H. (2018). Designing a robo-advisor for risk-averse, low-budget consumers. *Electronic Markets*, 28(3), 367–380. <https://doi.org/10.1007/s12525-017-0279-9>
- Katsiampa, P., McGuinness, P. B., Serbera, J. P., & Zhao, K. (2022). The financial and prudential performance of Chinese banks and Fintech lenders in the era of digitalization. *Review of Quantitative Finance and Accounting*, 1–53. <https://doi.org/10.1007/s11156-021-01033-9>
- Kim, B. J., Jung, J. Y., & Cho, S. W. (2021). Can ESG mitigate the diversification discount in cross-border M&A? *Borsa İstanbul Review*, 22(3), 607–615. <https://doi.org/10.1016/j.bir.2021.09.002>
- Kim, H., Ko, J., Jun, C., & Song, K. R. (2021). Going public through mergers with special purpose acquisition companies. *International Review of Finance*, 21(3), 742–768. <https://doi.org/10.1111/irfi.12297>
- Kohers, N., & Kohers, T. (2000). The value creation potential of high-tech mergers. *Financial Analysts Journal*, 56(3), 40–51. <https://doi.org/10.2469/faj.v56.n3.2359>
- Kohtamaki, M., Parida, V., Oghazi, P., Gebauer, H., & Baines, T. (2019). Digital servitization business models in ecosystems: A theory of the firm. *Journal of Business Research*, 104, 380–392. <https://doi.org/10.1016/j.jbusres.2019.06.027>
- Kou, G., Olgu Akdeniz, Ö., Dinçer, H., & Yuksel, S. (2021). Fintech investments in European banks: A hybrid IT2 fuzzy multidimensional decision-making approach. *Financial Innovation*, 7(1), 1–28. <https://doi.org/10.1186/s40854-021-00256-y>
- Lee, C. C., Li, X., Yu, C. H., & Zhao, J. (2021). Does fintech innovation improve bank efficiency? Evidence from China's banking industry. *International Review of Economics & Finance*, 74, 468–483. <https://doi.org/10.1016/j.iref.2021.03.009>
- Lee, I., & Shin, Y. J. (2018). Fintech: Ecosystem, business models, investment decisions, and challenges. *Business Horizons*, 61(1), 35–46. <https://doi.org/10.1016/j.bushor.2017.09.003>
- Leong, C., Tan, B., Xiao, X., Tan, F. T. C., & Sun, Y. (2017). Nurturing a FinTech ecosystem: The case of a youth microloan startup in China. *International Journal of Information Management*, 37(2), 92–97. <https://doi.org/10.1016/j.ijinfomgt.2016.11.006>
- Li, J., Li, J., Zhu, X., Yao, Y., & Casu, B. (2020). Risk spillovers between FinTech and traditional financial institutions: Evidence from the US. *International Review of Financial Analysis*, 71, Article 101544. <https://doi.org/10.1016/j.irfa.2020.101544>
- Lipson, M. L., & Mortal, S. (2007). Liquidity and firm characteristics: Evidence from mergers and acquisitions. *Journal of Financial Markets*, 10(4), 342–361. <https://doi.org/10.1016/j.finmar.2006.09.004>
- Li, Y., Spigt, R., & Swinkels, L. (2017). The impact of FinTech startups on incumbent retail banks' share prices. *Financial Innovation*, 3(1), 26. <https://doi.org/10.1186/s40854-017-0076-7>
- Liu, J., Li, X., & Wang, S. (2020). What have we learnt from 10 years of fintech research? A scientometric analysis. *Technological Forecasting and Social Change*, 155, Article 120022. <https://doi.org/10.1016/j.techfore.2020.120022>
- Liu, Y., Saleem, S., Shabbir, R., Shabbir, M. S., Irshad, A., & Khan, S. (2021). The relationship between corporate social responsibility and financial performance: A moderate role of fintech technology. *Environmental Science and Pollution Research*, 28(16), 20174–20187. <https://doi.org/10.1007/s11356-020-11822-9>
- Murinde, V., Rizopoulos, E., & Zachariadis, M. (2022). The impact of the FinTech revolution on the future of banking: Opportunities and risks. *International Review of Financial Analysis*, 81, Article 102103. <https://doi.org/10.1016/j.irfa.2022.102103>
- Najaf, K., Subramaniam, R. K., & Atayah, O. F. (2022). Understanding the implications of FinTech Peer-to-Peer (P2P) lending during the COVID-19 pandemic. *Journal of Sustainable Finance & Investment*, 12(1), 87–102. <https://doi.org/10.1080/20430795.2021.1917225>
- Nguyen, L., Tran, S., & Ho, T. (2021). Fintech credit, bank regulations and Bank performance: A cross-country analysis. *Asia-Pacific Journal of Business Administration*. <https://doi.org/10.1108/apjba-05-2021-0196>
- Novialdi, F. R., & Wardhani, R. (2019). Cross-border acquisition and financial leverage: The empirical evidence from acquisition in Asia. *Meditari Accountancy Research*, 28(1), 206–228. <https://doi.org/10.1108/MEDAR-12-2018-0413>
- Ozili, P. K. (2018). Impact of digital finance on financial inclusion and stability. *Borsa İstanbul Review*, 18(4), 329–340. <https://doi.org/10.1016/j.bir.2017.12.003>
- Palmie, M., Wincent, J., Parida, V., & Caglar, U. (2020). The evolution of the financial technology ecosystem: An introduction and agenda for future research on disruptive innovations in ecosystems. *Technological Forecasting and Social Change*, 151, Article 119779. <https://doi.org/10.1016/j.techfore.2019.119779>
- Papadakis, V. M., & Thanos, I. C. (2010). Measuring the performance of acquisitions: An empirical investigation using multiple criteria. *British Journal of Management*, 21(4), 859–873. <https://doi.org/10.1111/j.1467-8551.2009.00671.x>
- Phan, D. H. B., Narayan, P. K., Rahman, R. E., & Hutabarat, A. R. (2020). Do financial technology firms influence bank performance? *Pacific-Basin Finance Journal*, 62, Article 101210. <https://doi.org/10.1016/j.pacfin.2019.101210>
- Puschmann, T. (2017). *Fintech. Business & Information Systems Engineering*, 59(1), 69–76. <https://doi.org/10.1007/s12599-017-0464-6>
- Rao-Nicholson, R., Salaber, J., & Cao, T. H. (2016). Long-term performance of mergers and acquisitions in ASEAN countries. *Research in International Business and Finance*, 36, 373–387. <https://doi.org/10.1016/j.ribaf.2015.09.024>
- Rashid, A., & Naeem, N. (2017). Effects of mergers on corporate performance: An empirical evaluation using OLS and the empirical Bayesian methods. *Borsa İstanbul Review*, 17(1), 10–24. <https://doi.org/10.1016/j.bir.2016.09.004>
- Reddy, K., Qamar, M., & Yahanpath, N. (2019). Do mergers and acquisitions create value? The post-M&A performance of acquiring firms in China and India. *Studies in Economics and Finance*, 36(2), 240–264. <https://doi.org/10.1108/SEF-01-2018-0027>
- Salerno, D., Sampagnaro, G., & Verdoliva, V. (2022). Fintech and IPO underpricing: An explorative study. *Finance Research Letters*, 44, Article 102071. <https://doi.org/10.1016/j.frl.2021.102071>
- Shah, B. A., & Khan, N. (2017). Impacts of mergers and acquisitions on acquirer banks' performance. *Australasian Accounting, Business and Finance Journal*, 11(3), 30–54. <https://doi.org/10.14453/aabfj.v11i3.4>
- Shimizu, K., Hitt, M. A., Vaidyanath, D., & Pisano, V. (2004). Theoretical foundations of cross-border mergers and acquisitions: A review of current research and recommendations for the future. *Journal of International Management*, 10(3), 307–353. <https://doi.org/10.1016/j.intman.2004.05.005>
- Sibilkov, V. (2009). Asset liquidity and capital structure. *Journal of Financial and Quantitative Analysis*, 44(5), 1173–1196. <https://doi.org/10.1017/S0022109009990354>
- Stoekli, E., Dremel, C., & Uebemickel, F. (2018). Exploring characteristics and transformational capabilities of InsurTech innovations to understand insurance value creation in a digital world. *Electronic Markets*, 28(3), 287–305. <https://doi.org/10.1007/s12525-018-0304-7>
- Syukur, M., & Bungkilo, D. A. (2020). The aftermaths of acquisition in Indonesia. *International Journal of Monetary Economics and Finance*, 13(1), 16–33. <http://www.inderscience.com/link.php?id=105331>
- Talavera, O., Yin, S., & Zhang, M. (2018). Age diversity, directors' personal values, and bank performance. *International Review of Financial Analysis*, 55, 60–79. <https://doi.org/10.1016/j.irfa.2017.10.007>
- Tao, F., Liu, X., Gao, L., & Xia, E. (2017). Do cross-border mergers and acquisitions increase short-term market performance? The case of Chinese

- firms. *International Business Review*, 26(1), 189–202. <https://doi.org/10.1016/j.ibusrev.2016.06.006>
- Tao, R., Su, C. W., Naqvi, B., & Rizvi, S. K. A. (2022). Can fintech development pave the way for a transition towards low-carbon economy: A global perspective. *Technological Forecasting and Social Change*, 174, Article 121278. <https://doi.org/10.1016/j.techfore.2021.121278>
- Thakor, A. V. (2020). Fintech and banking: What do we know? *Journal of Financial Intermediation*, 41, Article 100833. <https://doi.org/10.1016/j.jfi.2019.100833>
- Thanos, I. C., Papadakis, V. M., & Angwin, D. (2020). Does changing contexts affect linkages throughout the mergers and acquisition process? A multi-phasic investigation of motives, pre-and post-acquisition and performance. *Strategic Change*, 29(2), 149–164. <https://doi.org/10.1002/jsc.2318>
- Trujillo, A. J., Garcia-Morales, E. E., Kabarriti, G., & Anderson, G. (2020). Do mergers and acquisitions improve firms' financial performance? The case of the US generic drug industry. *Managerial and Decision Economics*, 41(1), 10–24. <https://doi.org/10.1002/mde.3074>
- Wang, Y., Xiuping, S., & Zhang, Q. (2021). Can fintech improve the efficiency of commercial banks? An analysis based on big data. *Research in International Business and Finance*, 55, Article 101338. <https://doi.org/10.1016/j.ribaf.2020.101338>
- Zavolokina, L., Dolata, M., & Schwabe, G. (2016). The FinTech phenomenon: Antecedents of financial innovation perceived by the popular press. *Financial Innovation*, 2(1), 1–16. <https://doi.org/10.1186/s40854-016-0036-7>
- Zhang, W., Wang, K., Li, L., Chen, Y., & Wang, X. (2018). The impact of firms' mergers and acquisitions on their performance in emerging economies. *Technological Forecasting and Social Change*, 135, 208–216. <https://doi.org/10.1016/j.techfore.2018.05.015>
- Zhao, J., Li, X., Yu, C. H., Chen, S., & Lee, C. C. (2022). Riding the FinTech innovation wave: FinTech, patents and Bank performance. *Journal of International Money and Finance*, 122, Article 102552. <https://doi.org/10.1016/j.jimonfin.2021.102552>

Quratulain Akhtar, Ph.D Scholar Finance, MPhil Accounting & Finance. Lecturer University of Engineering and Technology(UET). Presented Research Article in BAM international Conference on Government Funding, and Got Role of Honor in Master's Degree.

Dr. **Safia Nosheen** is an Assistant Professor at School of Hassan Murad School of Management, University of Management and Technology, Lahore, Pakistan. She has MBA in Finance and PhD in Finance from the Asian Institute of Technology, Thailand. She has served different Universities for seventeen years that include Baluchistan University of Information Technology and Engineering and Management Sciences and Kohat University of Science and Technology. Her research interests lie in the area of Corporate Governance, Corporate Finance, Islamic Finance, International Finance, Risk Management etc.