International Journal of Business and Management; Vol. 18, No. 2; 2023
ISSN 1833-3850 E-ISSN 1833-8119
Published by Canadian Center of Science and Education

The Impact of FinTech Merge Operation on Financial Performance: Evidence from a Banking International Sample

Candida Bussoli[1], Danilo Conte[1] & Marco Barone[1]

[1] Department of Economics and Management, LUM Giuseppe Degennaro University, Italy

Correspondence: Marco Barone, Department of Economics and Management, LUM Giuseppe Degennaro University, S.S. 100 km 18, 70010 Casamassima (BA), Italy. E-mail: barone.phdstudent@lum.it

Received: November 16, 2022 Accepted: December 30, 2023 Online Published: February 4, 2023

doi:10.5539/ijbm.v18n2p72 URL: https://doi.org/10.5539/ijbm.v18n2p72

Abstract

The FinTech phenomenon has recently had a significant impact on the financial sector, opening up new potential for cost-saving measures and providing increasingly sophisticated financial services. On the other hand, FinTech has helped new players—typically technology companies—enter the financial sector and financial intermediation. Financial institutions have started cooperative and merging operations. As a result, to incorporate the new technology created in the market into their business model. This study aims to determine whether banks engaged in a FinTech merger experience improved financial performance. The research hypothesis is tested using an international sample composed of 106 financial intermediaries that implemented FinTech mergers from 2010 to 2018. The methodology employed is the Propensity-Score-Matching (PSM) technique which provides empirical results using a control group of 8,886 financial firms, with a total of 79,974 observations. The results demonstrate how a FinTech merger enhances intermediaries' financial performance. This evidence highlights the strategic value of FinTech fusion in the modern financial system. This study offers important insights for future research on the topic, as it contributes to combining two distinct outfits of literature, FinTech and M&A, into one that has been little addressed in the financial sector.

Keywords: FinTech, M&A, Innovation, financial institutions, financial performance

1. Introduction

In recent decades, the financial industry has been affected by the radical digital revolution in many industries (Iansiti & Levine, 2004), pushing it to react to a changing marketplace. The banking and finance industry is adopting digitization techniques to increase productivity, profitability, and service efficiency (Park et al., 2016).

In addition to creating new products for the banking sector, this transformation is changing the sector's technological infrastructure as the human aspect gradually gives way to the automation of internal procedures (Omarini, 2017). Such innovative automation is expanding the accessibility of financial services, making them more efficient and less operationally costly. Improvements have also been achieved in the greater transparency, convenience, speed, and personalization of financial services offered, leading to greater customer loyalty (Frame & White, 2004; Omarini, 2018).

However, FinTech (Financial Technology) is undermining the central role that traditional financial institutions have played to date. Through a process of unbureaucratization of financial services, new actors from outside the industry have been allowed to operate efficiently in traditional channels (Sapienza & Zingales, 2012). A significant reduction in entry barriers has led to an exponential increase in competition in the sector.

All this has created a highly competitive environment. In addition to internal competition within the industry, with existing traditional intermediaries having greater innovative capacity and newly established financial institutions, banks have also faced the entry of new technological players adapting their high-tech structure to offer new financial products to traditional bank customers.

Efficiency in the allocative function of resources coincides with the phenomenon of disintermediation in the financial sector (Scholtens & Van Wensveen, 2000).

Traditional institutions must bridge the technology gap to maintain adequate profitability levels, which turns out to be a risk.

Therefore, it seems necessary for financial firms to develop technologically advanced facilities for their survival. However, meeting this need is not a free lunch. The development of fully digital apparatuses requires significant investments that, especially small intermediaries, cannot sustain or more traditional or less efficient intermediaries may not accept.

Three paths emerge in organizational and governance restructuring toward FinTech solutions, of which one is not viable--inertia--and one is costly--in-house development.

A third path is a collaborative approach, in which, to avoid technological isolation, financial institutions can resort to mergers or acquisitions. This allows them to combat competitive pressure and adopt appropriate levels of FinTech tools. Horizontal growth is the fastest and single-expensive option for banks, which can use it to reap the benefits of the innovation process and maintain their competitiveness in the market.

This paper aims to analyse the impact of mergers with FinTech purposes on the earnings performance of financial firms. The paper's contribution is to combine two areas of the literature, that on mergers and acquisitions (M&A) and that on performance analysis of FinTech adoption in the financial sector, into a single under-explored line of research. In addition, the contribution is strengthened by the global scope of the sample and the observation period, which spans the years when the FinTech phenomena peaked. The paper is structured as follows. Section 2 presents the literature review leading to the research hypothesis. Section 3 presents the models, methodology, and sample. Section 4 discusses the primary results, and the final section provides brief concluding assessments and implications of the phenomenon studied.

2. Literature Review

2.1 The Impact of FinTech on the Financial System

Innovation in the financial sector aims to produce techniques and tools that can reduce risks and costs or increase the efficiency of financial products and services offered to meet the demands of financial system participants (Frame and White, 2004).

In addition, innovation includes the process related to the invention, research and development function, and dissemination of new tools.

FinTech, in particular, refers to the use of modern Internet technologies in the established business activities of the financial sector. It can be seen as a group of initiatives based on technological innovation that challenges traditional business models, service offerings, and roles (Gomber et al., 2017). The impact of this phenomenon can be seen in every aspect of the financial system worldwide, both from an economic and regulatory perspective (Weihuan et al., 2015).

The efficiency of financial systems is a prime objective (Levine, 1997), given the central role the financial system plays in economic development (Beck et al., 2010; Levine, 2004; Shen & Lee, 2006) and markets (Fatma et al., 2014; Matei & Voica, 2013).

It is also well known that financial innovation is linked to the improved ability of individuals to make decisions about investing and saving their financial resources (Berger, 2003; Frame & White, 2004; Merton, 1992, 1995; Miller, 1992; Van Horne, 1985). Every string of the financial system, from the role of technology to customer behaviour, from regulation to the production of financial instruments, has been changed by the emergence of FinTech (Gozman et al., 2018; Wonglimpiyarat, 2017).

The evolutionary trends from which the current FinTech scenario comes are identified as digital transformation in developed markets, digital financial services in developing countries, and FinTech start-ups (Arner et al., 2016).

However, one momentum for the explosion of new technologically advanced tools comes from the occurrence of the last major financial crisis, that of 2008, in which the role of financial markets and confidence on the part of savers failed (Uslaner, 2010).

In terms of the advancement of financial technology, the 2008 global financial crisis (GFC) marked a turning point. During the GFC, financial firms exposed all of their compliance and economic failings, leading to a lack of confidence in the financial system. Alternative means of financing, like crowdfunding, were favoured due to the credit rationing that followed the crisis (Blaseg & Koetter, 2015). Small and medium-sized firms (SMEs) are under pressure to find alternative funding sources, and the use of big data analytics and data science has changed how information is collected, stored, and evaluated, leading to significant research cost savings (Giudici, 2018).

In these failures, the FinTech phenomenon spreads, facilitating the rise of new competitors (Sapienza and Zingales, 2012).

Some banks implement FinTech solutions to handle client data and applications to compensate for the profitability lost due to the financial crisis in consumer and SMEs lending (McKillop et al., 2020). Due to the disintermediation of financial services brought on by the advent of FinTech in this setting, additional investor and consumer protection measures are now required (Giudici, 2018; Guo and Liang, 2016).

The disintermediation process challenges rigid ideas about financial intermediation that prioritise the bank's capacity to realise the advantages of economies of scale and the challenges that borrowers must overcome. Restrictions and limitations on direct transfers of resources between employers and borrowers make the existence and involvement of intermediaries economically possible (Gurley & Shaw, 1955). The static approach of financial intermediation theories does not correspond to the new financial system, which is highly dynamic and constantly developing. In imperfect and changing markets, the process of disintermediation threatens the existence of credit intermediaries acting as agents as the system generates a more efficient and transparent resource allocation function through deregulation processes and the evolution of information technology (Scholtens & Van Wensveen, 2000).

FinTech start-ups and established IT firms are increasing competition against banks (Jakšič & Marinč, 2019).

Frame et al. (2018) identify the most widely-used technologies that can be traced back to FinTech. Blockchain and the distributed ledger are used for the issuance and transfer of cryptocurrencies and pre-seed stages. Artificial Intelligence and Machine Learning are employed to promote loan services, account activity monitoring, cost-effective advice and credit assessment.

In conclusion, technological advancement has impacted the financial services sector's structure, operations, and economics. Information technology, mainly through automated distribution channels, of which the Internet is the most significant, alters how consumers get services. In information management, technology can reduce costs by automating processes that rely on paper and labour-intensive procedures (DeYoung et al., 2007; Hernando & Nieto, 2007).

As was already noted, the emergence of fintech began in 2008 and is seen as a bottom-up trend led by start-ups and IT firms (Arner et al., 2016). Start-ups in the fintech industry can avoid the intermediation fees, and minimal capital needs often associated with traditional banking services (Iman, 2018). Start-ups have been the primary force behind the expansion of FinTech, which has since been fueled by an increasing number of collaborations, mergers, and acquisitions by banks and other traditional financial institutions (Arner et al., 2016).

In this way, external factors like access to data, technological advantages, access to funding, a lack of regulations, and competition can be absorbed by banks to increase their competitiveness (Frost et al., 2019).

2.2 M&A in the Banking Industry

In the financial sector, the most prevalent mergers and acquisitions (M&A) is a substantial financial sector operation which contributes considerably to the decrease in the total number of financial institutions in the world (Amel et al., 2004; Berger et al., 1995; Berger et al., 1999; Goddard et al., 2007; Jones and Critchfield, 2005).

M&As pursue three main reasons (firm-level motivations) to undertake an acquisition within corporate finance theory (Berkovitch & Narayanan, 1993; Pasiouras et al., 2011): Synergy Motive, Agency Motive, and Hubris Hypothesis.

The synergy reasons are interrelated to the value-maximising motives, which amplify the acquiring firm's value (Berkovitch & Narayanan, 1993). Specifically, the concept of synergy consists of the potential of acquisition to maximise the wealth of both firms' shareholders, thereby generating gains for both shareholders. The concept of value maximising aligns with efficiency theory, stating that earnings via synergies are the principal motives for mergers and acquisitions (Trautwein, 1990). Efficiency theory discerns three kinds of synergy:

- Operational synergies occur from combining activities, products and markets (Sudarnam, 1996). These strategies achieve cost savings. Precisely, a distinction exists between economies of scale, where the highest level of output is reached through the least level of input and typifies horizontal mergers (same industry), and economies of scope, relating to the reduction of unit costs by producing a greater range of goods or services (Amel et al., 2004). Diversification of risk in terms of product and geographic differentiation represents another prominent theme; in light of this, the incorporation of two firms lessens the probability of bank failure (Pasiouras et al., 2011).
- The managerial synergies are achieved due to efficient planning and monitoring capabilities within one of the firms (Trautwein, 1990). On the contrary, some mergers opt to replace the acquired firm's inefficient management because the acquiring firm's management can be expected to use the target

firm's resources more efficiently.

- Financial synergies appear if the merged firm's capital cost becomes lower than the individual firms' cost of capital.

Ownership and control split implies the distinction between the figure of shareholders and the management figure; in this instance, the attention is focused on non-value maximisation, from which managerial reasons appear in terms of agency problems and hubris. Regarding agency grounds, M&As can be driven by conflicts of interest involving managers and shareholders; rather than maximising shareholder wealth, managers would maximise advantages of compensation, influence, wages, and reputation. These advantages frequently are linked to the greater firm size and higher turnover rates derived from mergers. The key point lies in that the purchaser's management selected the target company to optimally increase the firm's profitability (Berkovitch & Narayanan, 1993).

Hubris assumptions claim that acquisitions tend toward managerial mistakes and not synergetic earnings (Berkovitch & Narayanan, 1993). For instance, according to Roll (1986), managers wrongly overestimate the value of target firms. Consequently, they may engage in mergers when there are no synergies.

These characteristics concern all fields interested in M&A operations. Relating to the banking sector, an emphasis on the synergy incentive can be supported by empirical research on the drivers of bank mergers (Focarelli et al., 2002; Grabowski et al., 1995; Rhoades, 1998; Wheelock & Wilson, 2000, 2004; Zhang, 1995). Notably, the literature suggests that many relations exist between financial requirements and the probability (of acquisition) of getting acquired in the banking context. By assuming that banks are required to diversify and increase their product portfolio, M&As present a faster opportunity for diversification than growth in headcount (Kannan, 1998). Particularly, banks with low profitability, low capital/asset ratio, strong local market share or operating in cities face a greater opportunity to be purchased (Amel & Rhoades, 1989; Goddard et al., 2009; Hadlock et al., 1999; Hannan & Piloff, 2006; Hannan & Rhoades, 1987). The effect of acquisition pertains to cost savings (Rhoades, 1998), increased profitability (Kumara & Satyanarayana, 2013; Omoye & Aniefor, 2016), enhanced post-merger earnings (Delong & DeYoung, 2007; Heywood & McGinty, 2007; Richey et al., 2008), and cost efficiency gains (Berger & Humphrey, 1992; Kaur, 2010; Peristiani, 1997; Rhoades, 1998). Mergers and acquisitions to comparable organisations exhibit a higher probability of achieving profitability (Daughety, 1990; Heywood & McGinty, 2007; Huck et al., 2004; Perry & Porter, 1985).

Profitability, return on capital invested, GP margin, and debt-to-equity ratio reveal a considerable improvement after the merger (Khan, 2011), whereas net income and the ratio of equity to total assets suffered a substantial impact (Chadamiya et al., 2012). Several external factors prompt banks to conduct a merger and acquisition deal.

Specific reasons stem the need for a bank to comply with the demands of financial regulators in terms of minimum capital adequacy, and some are due to the process of deregulation and liberalisation of financial services, globalisation, and industrial and technological developments connected to the reduction of IT costs and the progress of Internet services.

3. Theoretical Framework and Research Hypothesis

As a vehicle for the diffusion of new technologies (Damanpour, 1991, 1992; Mansfield, 1961), merger operations can accelerate the transmission of new information and spread the risks associated with these technologies over larger volumes of output.

Competition in the banking sector has increased due to the emergence of FinTech companies that provide typical banking products, such as loans, savings management, and investment products (Van Loo, 2018).

Innovative companies often operate without a banking licence and can operate outside the stringent regulation that conveys traditional financial institutions, increasing competitiveness for banks (Omarini, 2019).

The old banks chose to finalise a merger since they could not compete with the new high-tech banks due to the reduction of entrance barriers brought about by technology (Kress, 2020).

There is little research on the effects of M&A with a fintech focus. Most of the analyses relating to the acquisition transactions are prior to 2010.

Due to technological advantages, Kohers and Kohers (2000) discovered a positive short-term abnormal return in M&A transactions. The authors also recommended a possible market inefficiency in technology deals, particularly over a three-year term (Kohers, 2001).

Due to mergers and acquisitions between the financial and high-tech sectors, both at the corporate and consumer level, traditional financial services have improved (Ahuja & Katila, 2001; Kohers & Kohers, 2000).

Conn et al. (2005) discovered that cross-border and long-term mergers benefit more from acquisitions involving technical enterprises.

The investigation of cross-border mergers and the detection of corporate outperformance are the main topics of more recent research (Kohli & Mann, 2012; Lusyana & Sherif, 2016; Yoon & Lee, 2016).

For companies in emerging countries engaging in cross-border transactions, the literature demonstrates that technology mergers and acquisitions provide higher returns than non-technology mergers and acquisitions (Dranev et al., 2019).

This study examines the connection between M&A FinTech and bank financial performance in light of the paucity of research on M&A FinTech in the banking industry. A positive relationship between financial innovation and the ability to bring better savings and investment decisions emerged (Frame et al., 2018), whereby banks can improve their competitiveness (Frost et al., 2019). In line with the positive findings highlighted in the literature on M&A in banking, cost savings and efficiency (Goddard et al., 2009; Kaur & Kaur, 2010) and improved profitability and returns (Goddard et al., 2009; Kumara and Satyanarayana, 2013; Omoye & Aniefor, 2016; Richey et al., 2008), leads to the following research hypothesis:

HY: FinTech M&As and financial institution profitability are positively associated.

4. Empirical Research

In order to test the research hypothesis, the analysis is carried out on a pooled econometric model, on which tests for heteroscedasticity and collinearity are performed.

The econometric model used is:

$$\text{Profitability}_{it} = \alpha + \beta_1 D_{YearFinMerge_{it}} + \beta_2 \text{Leverage}_{it} + \beta_3 \text{LIQ}_{it} + \beta_4 \text{CostInc}_{it} + \beta_5 \text{Risk}_{it} + \beta_6 \text{Ln\_Sis1Mln}_{it} + \eta_i + \varepsilon_{it} \quad (1)$$

The analysis uses Propensity-Score-Matching (PSM) to create a control group through propensity scores generated using maximum likelihood (Rosenbaum and Rubin, 1983), leading to a cross-sectional analysis (Behr and Heid, 2011; Levi et al., 2014).

In the present work, PSM techniques allow the characteristics of the individual identities of the treatment group (Merge) to be replicated in the control group consisting of the non-FinTech merged financial actors. This balancing mechanism ensures that the two groups of financial institutions are relatively comparable in covariates.

The PSM uses logit models that consider the Gross Domestic Product (GDP) and inflation rate due to the presence of financial institutions from 72 countries in the sample. This balancing removes from the analysis any distortions due to country growth rates, which may have influenced the financial company's performance, and inflation, which may have excessively influenced the performance of the institutions' core business, affecting interest rates in that country. Furthermore, there is a positive association between GDP growth and mergers and acquisitions because financial institutions engaged in acquisitions could take advantage of the favourable business cycle to achieve the cost savings associated with economies of scale (Buch and DeLong, 2004a). The use of GDP as a homogenising factor is further justified by its influence on introducing new technologies: countries with strong economic growth are ideal environments for creating innovative technologies (Haddad and Hornuf, 2019).

Inflation is another country-specific element to consider when making M&A investment decisions. The literature (Focarelli & Pozzolo, 2001) shows a negative association between inflation and the probability of becoming a buyer in unusual financing transactions.

To verify the correct functioning of the PSM, two significance tests were performed on the differences in the averages between the financial companies that performed FinTech merger transactions and the group that did not perform such transactions. The first test was performed before the PSM and showed a significant divergence between the averages of the two groups; the second test after the PSM showed that these differences disappeared. After this test, regression analysis was performed.

4.1 Variables

Table 1 resumes the variables used.

Table 1. Variable definitions

Variable	Description	Source
Dependent Variables		
ROAA	(Net Income/Total Average Assets) %	Bank Focus
ROAE	(Net Income/Average Shareholder's Equity) %	Bank Focus
NIM	(Net Interest Income/Total Assets) %	Bank Focus
Independent Variable		
FinTechMerge	Dummy = 1 in the year in which the Financial Institutions acquires a FinTech firm	SNL Financial LC
Control Variables		
Leverage	(Equity/Liabilities) %	Bank Focus
LIQ	(Liquid assets/Deposit and short-term funding) %	Bank Focus
CostInc	(Total Operating Expenses/ Total Operating Income) %	Bank Focus
Risk	(Loan Loss Provision/Net Interest Revenue) %	Bank Focus
Sis1Mln	Secure Internet Server for 1 million people	Netcraft's SLL Server Survey

The dimension of financial performance is broken down into three profitability ratios.

The Return on Average Assets (ROAA) represents the profitability of a firm's assets and is calculated by considering the ratio between net profit and average total assets. The indicator expresses the profitability of the average value of total assets intermediated by the bank (Aupperle et al., 1985; Barnett & Salomon, 2012; Simpson & Kohers, 2002; Soana, 2011; Van der Laan et al., 2008).

ROAE, the ratio between net income and the average shareholders' equity, reflects how effectively a bank's management uses its shareholders' funds (Pasiouras & Kosmidou, 2007; Petria et al., 2015; Sufian & Habibullah, 2009). It can provide a more accurate picture of the financial institution's profitability than Return on Equity (ROE), mainly when the equity value has changed significantly during the financial year.

The last financial indicator is the Net Interest Margin (NIM), calculated as Net Interest Income (the difference between a bank's interest income from lending and the interest it pays to depositors) on Total Assets. The higher this ratio, the higher the bank's margin, or the cheaper the bank's collection of financial resources (Busch & Memmel, 2015; Hamadi & Awdeh, 2012).

The independent variable (FinTechMerge) is a dummy in which the value can be equal to 1 if the finance company has merged in at least one year of the period considered, or 0 otherwise. Data on financial companies that have carried out M&A transactions are obtained from the SNL Financial LC database.

Four bank-specific control variables were used: Leverage is an indicator of bank capital adequacy (Beccalli & Frantz, 2010; Pasiouras & Gaganis, 2007; Pasiouras et al., 2011); Liquidity (LIQ) represents the liquidity profile of financial intermediaries, calculated through the ratio of the value of liquid assets (cash and bank borrowings, trading securities measured at fair value, loans to banks, repurchase agreements and cash collateral) on deposit and short-term funding (Beccalli & Frantz, 2010; Pasiouras & Gaganis, 2007; Pasiouras et al., 2011); Loan Loss Provision on the Net Interest Revenue (Risk), the ability of a financial institution to cover its expenses using provisions for bad debts collected through interest; Cost-To-Income Ratio (CostInc), defined as the operating cost that is required to generate one unit of income (Focarelli et al., 2002; Hernando et al., 2009; Molyneux, 2003; Pasiouras & Gaganis, 2007).

In addition, a country-specific control variable was inserted, taken from the World Development Indicators (WDI) database. Sis1Mln (Secure Internet servers per one million people) represents the number of distinct, publicly-trusted TLS/SSL certificates in the Netcraft Secure Server Survey. This indicator makes it possible to check the technological level of each country through the security of the servers used.

BankFocus Bureau van Dijk provided bank-specific financial variables. Before the analysis, observations in the extreme tails of the 1% were winsorized.

4.2 Sample

The sample consists of 80,080 financial firms' observations distributed worldwide, whose data were collected from 2010 to 2018.

The sample is, in turn, divided into two subgroups (Table 2).

Table 2. Composition of groups in the sample

MERGE	Frequencies	Percent	Cumulative
0	79,974	99.87	99.87
1	106	0.13	100
Total	80,080	100	

Source: Processing of authors.

The first subgroup consists of 106 companies conducting at least one merger operation for FinTech purposes during the period considered (Table 3). The subsample includes only a few categories of financial players that can be classified as banks, special purpose lenders or savings banks.

Table 3. Frequency of mergers over the years

Year	Frequencies	Percent	Cumulative
2010	11	10.38	10.38
2011	9	8.49	18.87
2012	10	9.43	28.3
2013	3	2.83	31.13
2014	7	6.60	37.74
2015	12	11.32	49.06
2016	19	17.92	66.98
2017	19	17.92	84.91
2018	16	15.09	100
Total	106	100.00	

Source: Processing of authors.

Table 4 shows that the countries with the highest number of FinTech merge transactions are the United States (n = 37), France, Brazil, Japan and India (n = 5 each). The second subgroup comprises active financial firms that did not make FinTech M&A operations in the period considered. This second subgroup consists of 8,886 companies whose total assets are at least equal to or greater than USD 4,000,000. The choice of this minimum threshold is in line with the lowest total asset value recorded for the subgroup that merged with FinTech in the same period. The sum of observations for the second group is 79,974.

Table 4. Frequency of mergers by country

Country	Frequencies	Percent	Cumulative
Australia	2	1.89	1.89
Austria	1	0.94	2.83
Bangladesh	2	1.89	4.72
Brazil	5	4.72	9.43
Canada	2	1.89	11.32
France	7	6.6	17.92
Germany	2	1.89	19.81
Iceland	2	1.89	21.7
India	5	4.72	26.42
Indonesia	1	0.94	27.36
Japan	5	4.72	32.08
Kazakhstan	1	0.94	33.02
Malaysia	4	3.77	36.79
Nepal	1	0.94	37.74
Netherlands	2	1.89	39.62
New Zealand	1	0.94	40.57
Norway	2	1.89	42.45
Philippines	3	2.83	45.28

Qatar	1	0.94	46.23
Russia	3	2.83	49.06
South Africa	2	1.89	50.94
Spain	3	2.83	53.77
Sweden	2	1.89	55.66
Switzerland	4	3.77	59.43
Taiwan	1	0.94	60.38
Thailand	1	0.94	61.32
United Arab Emirates	1	0.94	62.26
United Kingdom	3	2.83	65.09
United States	37	34.91	100
Total	106	100	

Source: Processing of authors.

Table 5 contains the descriptive statistics for the dependent and independent variables divided into the two subgroup types.

Table 5. Descriptive Statistics before PSM

FinTech-merge						FinTech-non-merge					T-test
Bank-specific variable	Obs	Mean	St. Dev.	Min	Max	Obs	Mean	St. Dev.	Min	Max	p-value
ROAA	898	1.01	1.11	-3.15	5.94	77,595	0.90	1.50	-1.84	10.65	0.038
ROAE	896	9.66	8.69	-33.10	29.83	77,490	6.39	7.37	-21.00	28.17	0.000
NIM	870	2.42	1.67	-0.74	8.13	54,985	3.35	1.10	0.40	9.51	0.357
Leverage	898	12.09	13.76	2.80	90.03	69,696	34.37	37.18	4.57	100.00	0.000
LIQ	869	37.31	34.32	2.06	186.96	55,291	16.05	16.48	1.35	99.49	0.048
CostInc	869	60.53	16.03	21.25	118.30	55,571	67.84	16.58	25.36	128.83	0.000
Risk	829	16.64	19.27	-19.01	103.38	54,366	7.26	12.72	-9.44	77.23	0.048
Country-specific variable											
Sis1Mln	987	12,969	26,961	0.21	123,980	79,020	24,399	37,056	0.07	277,330	0.000

Source: Processing of authors.

Furthermore, it should be reported that these statistics are carried out before the PSM.

The highest values belong to the dependent variable Sis1Mln, with a mean of 12,969.72; for these reasons, the logarithmic (Ln_Sis1Mln) is used.

The two dependent variables show a mean of 1.01% for ROAA and 9.66% for ROAE.

Sis1Mln shows wide variability in implementing secure internet servers through the different countries included in the sample: the minimum values are 0.21 and 0.07, and the maximum are 26,961.06 and 37,056.12.

The last column on the right shows the p-values for the t-test on the statistical differences between the means of the two groups. The null hypothesis (Ho: diff = 0) is rejected at the 5% level for all treated variables (except for the NIM), indicating a significant statistical difference between the averages of the two groups (FinTech merge and non-merge).

Table 6 shows the correlation analysis. The analysis shows that the independent variable used is positively and significantly correlated with ROAE (5%) and LIQ (5%) and negatively with the control variable Leverage (5%).

ROAE is significantly correlated to all variables used, except for the country-specific and liquidity ratio. ROAA, in addition to ROAE (positive correlation significant at 1%), is significantly and negatively correlated with Risk (1%) and CostInc (1%).

Table 6. Correlation matrix

Variable	ROAA	ROAE	NIM	FinTechMerge	Leverage	LIQ	CostInc	Risk	Sis1Mln
ROAA	1.0000								
ROAE	0.7037***	1.0000							
NIM	0.2486***	0.3027***	1.0000						
FinTechMerge	0.1031	0.1671**	0.0690	1.0000					
Leverage	0.0317	-0.2595***	0.1216	-0.1726**	1.0000				
LIQ	0.0121	-0.0555	-0.3546***	0.1465**	0.0490	1.0000			
CostInc	-0.1927***	-0.3396***	-0.0992	-0.1192	0.0428	0.0798	1.0000		
Risk	-0.2422***	-0.2614***	0.2374***	0.0259	-0.1203	-0.0733	-0.1425*	1.0000	
Sis1Mln	-0.0100	-0.0267	-0.1543**	0.0178	0.0375	0.0365	0.0160	-0.2173***	1.0000

Source: Processing of authors.

Note. Significance: * p < 0.10; ** p < 0.05; *** p < 0.01.

5. Analysis and Discussion

The results of the three models are shown in Table 7.

These results are derived from Ordinary Least Squares (OLS) regression because, as described above, using PSM meant isolating the data from the two subgroups on individual years. This made it possible to identify the year in which a particular identity in the sample performed the FinTech merge.

Table 7. Regression Analysis - Pooled models

Variable	ROAA (1)	ROAE (2)	NIM (3)
FinTechMerge	0.259***	2.278**	0.321*
	(0.100)	(1.056)	(0.182)
Leverage	0.075***	-0.159	0.161***
	(0.022)	(0.148)	(0.036)
LIQ	-0.001	-0.0159	-0.016***
	(0.003)	(0.025)	(0.003)
CostInc	-0.014**	-0.175***	0.002
	(0.006)	(0.062)	(0.006)
Risk	-0.012***	-0.142***	0.014***
	(0.005)	(0.054)	(0.006)
Ln_Sis1Mln	-0.078***	-0.745***	-0.139***
	(0.024)	(0.248)	(0.051)
Constant	1.599***	27.903***	1.922***
	(0.398)	(3.140)	(0.635)
R-squared	0.348	0.257	0.395
Observations	160	160	160
F test	13.26	11.13	15.40
p-value F test	(0.000)	(0.000)	(0.000)

Significance: * p < 0.10; ** p < 0.05; *** p < 0.01; the value of the error standard is shown in parentheses.

Source: Processing of authors.

The results confirm the research hypothesis of this paper. In fact, the dichotomous variable FinTechMerge seems to have a positive and significant relationship with all three dependent variables, specifically: with ROAA the significance is at 1% ($\beta_1 = 0.259$) (Column 1); ROAE is positively associated with a level of 5% ($\beta_1 = 2.278$) (Column 2); finally, NIM at 10% ($\beta_1 = 0.321$) (Column 3).

These findings are in line with the literature inherent to merge operations in the financial sector (Focarelli et al.,

2002; Grabowski et al., 1995; Kohers & Kohers, 2001; Rhoades, 1998; Wheelock & Wilson, 2000, 2004; Zhang, 1995) and those related to FinTech innovation (Conn et al., 2005; Dranev et al., 2019; Kohli & Mann, 2012; Lusyana & Sherif, 2016; Yoon & Lee, 2016).

These results also confirm the positive relationship between financial innovation and the ability to bring better savings and investment decisions (Frame et al., 2018), whereby banks can improve their competitiveness (Frost et al., 2019).

Regarding the control variables used, the Risk shows a significant relationship (at 1% of p-value) with all dependent variables: in a negative direction with ROAA (β_5 = -0.012) and ROAE (β_5 = -0.142) and positive with NIM (β_5 = 0.014). Similarly, the country-specific variable assumes a negative relationship with ROAA (β_6 = -0.078), ROAE (β_6 = -0.745) and NIM (β_6 = -0.139). The operational efficiency variable (CostInc) has a negative association with ROAA (β_4 = -0.014; p-value = 5%) and ROAE (β_4 = -0.175; 1%). Leverage has a positive rapport at 1% with ROAA (β_2 = 0.075) and NIM (β_2 = 0.161). There are 160 observations in all models, and the F-test is always above the threshold value of 10. The highest R-squared is recorded for NIM (39.5%), while for ROAE, it is the lowest (25.7%).

According to the findings of the empirical investigation, financial firms that combined specifically for FinTech objectives in the years 2010 to 2018 also benefited from increased profitability in terms of ROAA, ROAE, and net interest rate. According to the literature on both the M&A and FinTech sides, the outcomes are attributable to the synergies that M&A transactions can produce in conjunction with the quick process of transferring technological expertise; these synergies manage to produce cost reduction, better efficiency, and better savings and investment decisions (Goddard et al., 2009; Kaur, 2010). (Frame et al., 2018). Better profitability and greater returns are possible (Goddard et al., 2009; Kumara & Satyanarayana, 2013; Omoye & Aniefor, 2016; Richey et al., 2008). The analysis' conclusions support the generally believed perception of the sector's prospects; the disruptive forces affecting the sector show how the standard bank architecture has a negative effect. Branches are disappearing at an increasing rate because most banking tasks can be completed remotely using smartphones or other devices. Due to these factors, the importance of profit margins from traditional businesses would decrease.

6. Conclusions

FinTech’s undeniable impact has been the focus of studies in recent years. Due to its general use in the financial industry, this issue has received attention.

Indeed, all over the world, intermediaries have implemented - or plan to implement - the most cutting-edge technology tools in their structures, which necessitates a complete redesign of the organisational and governance structure from the top management down to the lowest operational level. Due to the replacement of conventional financial intermediation by new business prospects, the FinTech phenomenon has proliferated. The sector becomes more competitive as a result.

The two plausible approaches to closing the technological gap, excluding inertia, are internal development and horizontal expansion via financial M&A operations.

Internal development, nevertheless, could be too expensive, especially for smaller businesses. However, mergers and acquisitions are promoted as a quicker method for banks and other financial sector firms to implement technological advancements. This study sought to determine whether such purely FinTech M&A deals increase the profitability of financial intermediaries. In particular, the research hypothesis attributed a favourable influence of FinTech M&A on the profitability of assets and equity quality of operations, in line with the reference literature on Fintech and M&A concerns in the financial sector. Between the treatment and control groups, a comparison using descriptive statistics, correlation, and regression analysis were used to conduct the analysis. Using the Propensity-Score-Matching method, the latter was acquired.

This work adds to uniting two disparate bodies of literature - FinTech and M&A - into one that has not received much attention in the financial sector, and as a result, it provides crucial insights for future research on the subject. The recommendation is to apply combined samples with a bigger size by including data from the analysis from the previous two years. Additionally, it might be desirable to concentrate the research on specific countries to eliminate any variation caused by country-specific characteristics. The findings can serve as a springboard for managers of smaller institutions debating whether to adopt new technology or are mired in a wave of lethargy.

References

Ahuja, G., & Katila, R. (2001). Technological acquisitions and the innovation performance of acquiring firms: A longitudinal study. *Strategic Management Journal, 22*(3), 197-220. https://doi.org/10.1002/smj.157

Amel, D. F., & Rhoades, S. A. (1989). Empirical evidence on the motives for bank mergers. *Eastern Economic Journal, 15*(1), 17-27. http://www.jstor.org/stable/40325213

Amel, D., Barnes, C., Panetta, F., & Salleo, C. (2004). Consolidation and efficiency in the financial sector: A review of the international evidence. *Journal of Banking & Finance, 28*(10), 2493-2519. https://doi.org/10.1016/j.jbankfin.2003.10.013

Arner, D. W., Barberis, J., & Buckey, R. P. (2016). FinTech, RegTech, and the reconceptualization of financial regulation. *Nw. J. Int'l L. & Bus., 37*, 371.

Aupperle, K. E., Carroll, A. B., & Hatfield, J. D. (1985). An empirical examination of the relationship between corporate social responsibility and profitability. *Academy of management Journal, 28*(2), 446-463. https://doi.org/10.5465/256210

Barnett, M. L., & Salomon, R. M. (2012). Does it pay to be really good? Addressing the shape of the relationship between social and financial performance. *Strategic Management Journal, 33*(11), 1304-1320. https://doi.org/10.1002/smj.1980

Beccalli, E., & Frantz, P. (2010). What are the Determinants of Mergers and Acquisitions in Banking? In *New Issues in Financial Institutions Management* (pp. 171-199). Palgrave Macmillan, London. https://doi.org/10.1057/9780230299153_11

Beck, T., Demirgüç-Kunt, A., & Levine, R. (2010). Financial institutions and markets across countries and over time: The updated financial development and structure database. *The World Bank Economic Review, 24*(1), 77-92. https://doi.org/10.1093/wber/lhp016

Behr, A., & Heid, F. (2011). The success of bank mergers revisited. An assessment based on a matching strategy. *Journal of Empirical Finance, 18*(1), 117-135. https://doi.org/10.1016/j.jempfin.2010.08.006

Berger, A. N. (2003). The economic effects of technological progress: evidence from the banking industry. *Journal of Money, credit and Banking,* 141-176. https://doi.org/10.1353/mcb.2003.0009

Berger, A. N., & Humphrey, D. B. (1992). Measurement and efficiency issues in commercial banking. In *Output measurement in the service sectors* (pp. 245-300). University of Chicago Press. http://www.nber.org/chapters/c7237

Berger, A. N., Demsetz, R. S., & Strahan, P. E. (1999). The consolidation of the financial services industry: Causes, consequences, and implications for the future. *Journal of Banking & Finance, 23*(2-4), 135-194. https://doi.org/10.1016/S0378-4266(98)00125-3

Berger, A. N., Kashyap, A. K., Scalise, J. M., Gertler, M., & Friedman, B. M. (1995). The transformation of the US banking industry: What a long, strange trip it's been. *Brookings Papers on Economic Activity*, (2), 55-218. https://doi.org/10.2307/2534612

Berkovitch, E., & Narayanan, M. P. (1993). Motives for takeovers: An empirical investigation. *Journal of Financial and Quantitative analysis, 28*(3), 347-362. https://doi.org/10.2307/2331418

Blaseg, D., & Koetter, M. (2015). *Friend or foe? Crowdfunding versus credit when banks are stressed* (No. 8/2015). IWH Discussion Papers. http://hdl.handle.net/10419/117342

Buch, C. M., & DeLong, G. (2004). Cross-border bank mergers: What lures the rare animal? *Journal of Banking & Finance, 28*(9), 2077-2102. https://doi.org/10.1016/j.jbankfin.2003.08.002

Busch, R., & Memmel, C. (2015). Banks' net interest margin and the level of interest rates. https://doi.org/10.2139/ssrn.2797040

Chadamiya, B. P., & Menapara, M. R. (2012). Financial performance of Indian banking sectors during pre and post mergers and acquisitions. *Journal of Applied Management and Investments, 1*(2), 146-150.

Conn, R. L., Cosh, A., Guest, P. M., & Hughes, A. (2005). The impact on UK acquirers of domestic, cross-border, public and private acquisitions. *Journal of Business Finance & Accounting, 32*(5-6), 815-870. https://doi.org/10.1111/j.0306-686X.2005.00615.x

Damanpour, F. (1991). Organizational innovation: A meta-analysis of effects of determinants and moderators. *Academy of management journal, 34*(3), 555-590. https://doi.org/10.2307/256406

Damanpour, F. (1992). Organizational size and innovation. *Organization studies, 13*(3), 375-402. https://doi.org/10.1177/017084069201300304

Daughety, A. F. (1990). Beneficial concentration. *The American Economic Review, 80*(5), 1231-1237.

https://www.jstor.org/stable/2006772

DeLong, G., & DeYoung, R. (2007). Learning by observing: Information spillovers in the execution and valuation of commercial bank M&As. *The journal of Finance, 62*(1), 181-216. https://doi.org/10.1111/j.1540-6261.2007.01205.x

DeYoung, R., Lang, W. W., & Nolle, D. L. (2007). How the Internet affects output and performance at community banks. *Journal of Banking & Finance, 31*(4), 1033-1060. https://doi.org/10.1016/j.jbankfin.2006.10.003

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

Fatma, M., Rahman, Z., & Khan, I. (2014). Multi-item stakeholder based scale to measure CSR in the banking industry. *International Strategic Management Review, 2*(1), 9-20. https://doi.org/10.1016/j.ism.2014.06.001

Focarelli, D., & Pozzolo, A. F. (2001). The patterns of cross-border bank mergers and shareholdings in OECD countries. *Journal of banking & Finance, 25*(12), 2305-2337. https://doi.org/10.1016/S0378-4266(01)00192-3

Focarelli, D., Panetta, F., & Salleo, C. (2002). Why do banks merge? *Journal of Money, Credit and Banking,* 1047-1066. https://doi.org/10.1353/mcb.2002.0054

Frame, W. S., & White, L. J. (2004). Empirical studies of financial innovation: lots of talk, little action? *Journal of Economic Literature, 42*(1), 116-144. https://doi.org/10.1257/002205104773558065

Frame, W. S., Wall, L. D., & White, L. J. (2018). Technological change and financial innovation in banking: Some implications for fintech. https://doi.org/10.1093/oxfordhb/9780198824633.013.10

Frost, J., Gambacorta, L., Huang, Y., Shin, H. S., & Zbinden, P. (2019). BigTech and the changing structure of financial intermediation. *Economic Policy, 34*(100), 761-799. https://doi.org/10.1093/epolic/eiaa003

Giudici, P. (2018). Financial data science. *Statistics & Probability Letters, 136*, 160-164. https://doi.org/10.1016/j.spl.2018.02.024

Goddard, J., McKillop, D., & Wilson, J. O. (2009). Consolidation in the US credit union sector: Determinants of the hazard of acquisition. *Journal of Financial Services Research, 36*, 231-252. https://doi.org/10.1007/s10693-009-0055-x

Goddard, J., Molyneux, P., Wilson, J. O., & Tavakoli, M. (2007). European banking: An overview. *Journal of Banking & Finance, 31*(7), 1911-1935. https://doi.org/10.1016/j.jbankfin.2007.01.002

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 start-ups: insights from SWIFT's innotribe competition. *Journal of Management Information Systems, 35*(1), 145-179. https://doi.org/10.1080/07421222.2018.1440768

Grabowski, R., Mathur, I., & Rangan, N. (1995). The role of takeovers in increasing efficiency. *Managerial and Decision Economics, 16*(3), 211-223. https://doi.org/10.1002/mde.4090160304

Guo, Y., & Liang, C. (2016). Blockchain application and outlook in the banking industry. *Financial innovation, 2*(1), 1-12. https://doi.org/10.1186/s40854-016-0034-9

Gurley, J. G., & Shaw, E. S. (1955). Financial aspects of economic development. *The American Economic Review, 45*(4), 515-538. https://www.jstor.org/stable/1811632

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

Hadlock, C., Houston, J., & Ryngaert, M. (1999). The role of managerial incentives in bank acquisitions. *Journal of Banking & Finance, 23*(2-4), 221-249. https://doi.org/10.1016/S0378-4266(98)00092-2

Hamadi, H., & Awdeh, A. (2012). The determinants of bank net interest margin: Evidence from the Lebanese banking sector. *Journal of Money, Investment and Banking, 23*(3), 85-98.

Hannan, T. H., & Pilloff, S. J. (2009). Acquisition targets and motives in the banking industry. *Journal of Money, Credit and Banking, 41*(6), 1167-1187. https://doi.org/10.1111/j.1538-4616.2009.00251.x

Hannan, T. H., & Rhoades, S. A. (1987). Acquisition targets and motives: The case of the banking industry. *The*

Review of Economics and Statistics, 67-74. https://doi.org/10.2307/1937902

Hernández-Murillo, R., Llobet, G., & Fuentes, R. (2006). Strategic online-banking adoption. FRB of St. Louis Working Paper No.

Hernando, I., & Nieto, M. J. (2007). Is the Internet delivery channel changing banks' performance? The case of Spanish banks. *Journal of Banking & Finance, 31*(4), 1083-1099. https://doi.org/10.1016/j.jbankfin.2006.10.011

Hernando, I., Nieto, M. J., & Wall, L. D. (2009). Determinants of domestic and cross-border bank acquisitions in the European Union. *Journal of Banking & Finance, 33*(6), 1022-1032. https://doi.org/10.1016/j.jbankfin.2008.10.017

Heywood, J. S., & McGinty, M. (2007). Convex costs and the merger paradox revisited. *Economic Inquiry, 45*(2), 342-349. https://doi.org/10.1111/j.1465-7295.2006.00010.x

Huck, S., Konrad, K. A., & Müller, W. (2004). Profitable horizontal mergers without cost advantages: The role of internal organization, information and market structure. *Economica, 71*(284), 575-587. https://doi.org/10.1111/j.0013-0427.2004.00389.x

Iansiti, M., & Levien, R. (2004). The keystone advantage: what the new dynamics of business ecosystems mean for strategy, innovation, and sustainability. Harvard Business Press.

Iman, N. (2018). Assessing the dynamics of fintech in Indonesia. *Investment Management and Financial Innovations, 15*(4), 296-303. https://doi.org/10.21511/imfi.15(4).2018.24

Jakšič, M., & Marinč, M. (2019). Relationship banking and information technology: The role of artificial intelligence and FinTech. *Risk Management, 21*(1), 1-18. https://doi.org/10.1057/s41283-018-0039-y

Jones, K. D., & Critchfield, T. (2005). Consolidation in the US banking industry: is the long, strange trip about to end. *FDIC Banking Rev., 17,* 31. https://doi.org/10.2139/ssrn.686101

Kannan, K. (1998). Mergers are a strategic imperative for the banks survival. *Business Today*, 71-72.

KAUR, B. P., & Kaur, G. (2010). Impact of mergers on the cost efficiency of Indian commercial banks. *Eurasian Journal of Business and Economics, 3*(5), 27-50. https://core.ac.uk/outputs/25775500

Khan, A. A. (2011). Merger and Acquisitions (M&As) in the Indian banking sector in post liberalization regime. *International Journal of Contemporary Business Studies, 2*(11), 31-45.

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

Kohers, N., & Kohers, T. (2001). Takeovers of technology firms: Expectations vs. reality. *Financial management,* 35-54. https://doi.org/10.2307/3666375

Kohli, R., & Mann, B. J. S. (2012). Analyzing determinants of value creation in domestic and cross border acquisitions in India. *International Business Review, 21*(6), 998-1016. https://doi.org/10.1016/j.ibusrev.2011.11.006

Kress, J. C. (2020). Modernizing bank merger review. *Yale J. on Reg., 37,* 435.

Kumara, M. N. V., & Satyanarayana, D. (2013). Comparative study of pre and post corporate integration through mergers and acquisition. *International Journal of Business and Management Invention, 2*(3), 31-38.

Levi, M., Li, K., & Zhang, F. (2014). Director gender and mergers and acquisitions. *Journal of Corporate Finance, 28,* 185-200. https://doi.org/10.1016/j.jcorpfin.2013.11.005

Levine, R. (1997). Financial development and economic growth: views and agenda. *Journal of economic literature, 35*(2), 688-726. https://www.jstor.org/stable/2729790

Levine, R. (2004). *The corporate governance of banks: A concise discussion of concepts and evidence* (Vol. 3404). World Bank Publications. https://doi.org/10.1596/1813-9450-3404

Lusyana, D., & Sherif, M. (2016). Do mergers create value for high-tech firms? The hounds of dotcom bubble. *The Journal of High Technology Management Research, 27*(2), 196-213. https://doi.org/10.1016/j.hitech.2016.10.009

Mansfield, E. (1963). The speed of response of firms to new techniques. *The Quarterly Journal of Economics, 77*(2), 290-311. https://doi.org/10.2307/1884404

Matei, M., & Voica, M. C. (2013). Social Responsibility in the Financial and Banking Sector. *Economic*

Insights-Trends & Challenges, 65(1).

McKillop, D., French, D., Quinn, B., Sobiech, A. L., & Wilson, J. O. (2020). Cooperative financial institutions: A review of the literature. *International Review of Financial Analysis, 71*, 101520. https://doi.org/10.1016/j.irfa.2020.101520

Merton, R. C. (1992). Financial innovation and economic performance. *Journal of applied corporate finance, 4*(4), 12-22. https://doi.org/10.1111/j.1745-6622.1992.tb00214.x

Merton, R. C. (1995). Financial innovation and the management and regulation of financial institutions. *Journal of Banking & Finance, 19*(3-4), 461-481. https://doi.org/10.1016/0378-4266(94)00133-N

Miller, M. H. (1992). Financial innovation: achievements and prospects. *Journal of Applied Corporate Finance, 4*(4), 4-11. https://doi.org/10.1111/j.1745-6622.1992.tb00213.x

Molyneux, P., & Craig, B. (2003). Determinants of cross-border mergers in European banking. In *Foreign Direct Investment in the Real and Financial Sector of Industrial Countries* (pp. 273-294). Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-540-24736-4_11

Omarini, A. (2017). The digital transformation in banking and the role of FinTechs in the new financial intermediation scenario. https://doi.org/10.19070/2643-038X-170001

Omarini, A. E. (2018). The retail bank of tomorrow: a platform for interactions and financial services. *Conceptual and Managerial Challenges*. https://doi.org/10.22158/rem.v3n2p110

Omarova, S. T. (2020). Technology v Technocracy: Fintech as a Regulatory Challenge. *Journal of Financial Regulation, 6*(1), 75-124. https://doi.org/10.1093/jfr/fjaa004

Omoye, A. S., & Aniefor, S. J. (2016). Mergers and acquisitions: The trend in business environment in Nigeria. *Accounting and Finance Research, 5*(2), 10-19. https://doi.org/10.5430/afr.v5n2p10

Park, J. Y., Ryu, J. P., & Shin, H. J. (2016). Robo advisors for portfolio management. *Advanced Science and Technology Letters, 141*(1), 104-108. https://doi.org/10.14257/astl.2016.141.21

Pasiouras, F., & Gaganis, C. (2007). Financial characteristics of banks involved in acquisitions: evidence from Asia. *Applied Financial Economics, 17*(4), 329-341. https://doi.org/10.1080/09603100600675524

Pasiouras, F., & Kosmidou, K. (2007). Factors influencing the profitability of domestic and foreign commercial banks in the European Union. *Research in International Business and Finance, 21*(2), 222-237. https://doi.org/10.1016/j.ribaf.2006.03.007

Pasiouras, F., Tanna, S., & Gaganis, C. (2011). What drives acquisitions in the EU banking industry? The role of bank regulation and supervision framework, bank specific and market specific factors. *Financial Markets, Institutions & Instruments, 20*(2), 29-77. https://doi.org/10.1111/j.1468-0416.2011.00165.x

Peristiani, S. (1997). Do mergers improve the X-efficiency and scale efficiency of US banks? Evidence from the 1980s. *Journal of Money, Credit, and Banking*, 326-337. https://doi.org/10.2307/2953697

Perry, M. K., & Porter, R. H. (1985). Oligopoly and the incentive for horizontal merger. *The American Economic Review, 75*(1), 219-227. https://www.jstor.org/stable/1812716

Petria, N., Capraru, B., & Ihnatov, I. (2015). Determinants of banks' profitability: evidence from EU 27 banking systems. *Procedia economics and finance, 20*, 518-524. https://doi.org/10.1016/S2212-5671(15)00104-5

Rhoades, S. A. (1993). Efficiency effects of horizontal (in-market) bank mergers. *Journal of Banking & Finance, 17*(2-3), 411-422. https://doi.org/10.1016/0378-4266(93)90041-B

Rhoades, S. A. (1998). The efficiency effects of bank mergers: An overview of case studies of nine mergers. *Journal of Banking & Finance, 22*(3), 273-291. https://doi.org/10.1016/S0378-4266(97)00053-8

Richey Jr, R. G., Kiessling, T. S., Tokman, M., & Dalela, V. (2008). Market growth through mergers and acquisitions: The role of the relationship marketing manager in sustaining performance. *Industrial Marketing Management, 37*(4), 394-406. https://doi.org/10.1016/j.indmarman.2007.03.002

Roll, R. (1986). The hubris hypothesis of corporate takeovers. *Journal of Business*, 197-216. https://doi.org/10.1086/296325

Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika, 70*(1), 41-55. https://doi.org/10.1093/biomet/70.1.41

Sapienza, P., & Zingales, L. (2012). A trust crisis. *International Review of Finance, 12*(2), 123-131.

https://doi.org/10.1111/j.1468-2443.2012.01152.x

Scholtens, B., & Van Wensveen, D. (2000). A critique on the theory of financial intermediation. *Journal of Banking & Finance, 24*(8), 1243-1251. https://doi.org/10.1016/S0378-4266(99)00085-0

Shen, C. H., & Lee, C. C. (2006). Same financial development yet different economic growth: why? *Journal of Money, Credit and Banking*, 1907-1944. https://doi.org/10.1353/mcb.2006.0095

Simpson, W. G., & Kohers, T. (2002). The link between corporate social and financial performance: Evidence from the banking industry. *Journal of Business Ethics, 35*(2), 97-109. https://doi.org/10.1023/A:1013082525900

Soana, M. G. (2011). The relationship between corporate social performance and corporate financial performance in the banking sector. *Journal of Business Ethics, 104*(1), 133-148. https://doi.org/10.1007/s10551-011-0894-x

Stulz, R. M. (2019). Fintech, bigtech, and the future of banks. *Journal of Applied Corporate Finance, 31*(4), 86-97. https://doi.org/10.1111/jacf.12378

Sudarsanam, S., Holl, P., & Salami, A. (1996). Shareholder wealth gains in mergers: effect of synergy and ownership structure. *Journal of Business Finance & Accounting, 23*(5-6), 673-698. https://doi.org/10.1111/j.1468-5957.1996.tb01148.x

Sufian, F., & Habibullah, M. S. (2009). Bank specific and macroeconomic determinants of bank profitability: Empirical evidence from the China banking sector. *Frontiers of Economics in China, 4*(2), 274-291. https://doi.org/10.1007/s11459-009-0016-1

Thakor, A. V. (2020). Fintech and banking: What do we know? *Journal of Financial Intermediation, 41*, 100833. https://doi.org/10.1016/j.jfi.2019.100833

Trautwein, F. (1990). Merger motives and merger prescriptions. *Strategic management journal, 11*(4), 283-295. https://doi.org/10.1002/smj.4250110404

Uslaner, E. M. (2010). Trust and the economic crisis of 2008. *Corporate Reputation Review, 13*(2), 110-123. https://doi.org/10.1057/crr.2010.8

Van der Laan, G., Van Ees, H., & Van Witteloostuijn, A. (2008). Corporate social and financial performance: An extended stakeholder theory, and empirical test with accounting measures. *Journal of Business Ethics, 79*(3), 299-310. https://doi.org/10.1007/s10551-007-9398-0

Van Horne, J. C. (1985). Of financial innovations and excesses. *The Journal of Finance, 40*(3), 620-631. https://doi.org/10.1111/j.1540-6261.1985.tb04984.x

Van Loo, R. (2018). Making innovation more competitive: The case of fintech. *UCLA L. Rev., 65*, 232.

Weihuan, Z., Arner, D. W., & Buckley, R. P. (2015). Regulation of digital financial services in China: Last mover advantage. *Tsinghua China L. Rev., 8,* 25.

Wheelock, D. C., & Wilson, P. W. (2000). Why do banks disappear? The determinants of US bank failures and acquisitions. *Review of Economics and Statistics, 82*(1), 127-138. https://doi.org/10.1162/003465300558560

Wheelock, D. C., & Wilson, P. W. (2004). Consolidation in US banking: Which banks engage in mergers? *Review of Financial Economics, 13*(1-2), 7-39. https://doi.org/10.1016/j.rfe.2003.09.001

Wonglimpiyarat, J. (2017). FinTech banking industry: a systemic approach. *Foresight, 19*(6), 590-603. https://doi.org/10.1108/FS-07-2017-0026

Yoon, H., & Lee, J. J. (2016). Technology-acquiring cross-border M&As by emerging market firms: role of bilateral trade openness. *Technology Analysis & Strategic Management, 28*(3), 251-265. https://doi.org/10.1080/09537325.2015.1093618

Zhang, H. (1995). Wealth effects of US bank takeovers. *Applied financial economics, 5*(5), 329-336. https://doi.org/10.1080/758522760