

Title: The effect of fintech M&As on stock return in the context of macroeconomic environment

Elena Ochirova (corresponding author), PhD, HSE University, Russian Federation, eochirova@hse.ru

Detailed institutional address: Institute for Statistical Studies and Economics of Knowledge, HSE University, 13st.4 Myasnitskaya street, Moscow, 101000, Russian Federation

Mikhail Miriakov, PhD, HSE University, Russian Federation, mmiryakov@hse.ru

Detailed institutional address: Faculty of Economic Sciences, HSE University, 11 Pokrovsky Bulvar, Moscow, 109028, Russian Federation

Authors' Information

Elena Ochirova is a research fellow and a senior lecturer at the Institute for Statistical Studies and Economics of Knowledge, Higher School of Economics (HSE University). She focuses on research in financial innovation, technology management and corporate finance. She has professional experience in the public finance and manufacturing industry. She obtained her PhD in Economics from HSE University where she studied the efficiency of technological mergers and acquisitions; earlier Elena obtained a master' degree in finance and banking from National Chung Cheng University, Taiwan.

Mikhail Miriakov is a senior lecturer at the Department of Theoretical Economics, HSE University and teaches advanced courses of micro- and macroeconomics. He received PhD in economics and master's degree in finance from HSE University. As a doctoral researcher he studied the history of economic thought and the methodology of science. Currently, he focuses on the research in the management of innovation and financial economics. He is also a leading expert at the Centre for Quantitative Modelling where he is engaged in applied macroeconomic modeling.

Abstract

Mergers and acquisitions involving financial technology companies (fintech M&As) have experienced strong growth over the past decade. This study is aimed to assess the impact of fintech M&As on stock return and examine whether macroeconomic variables influence the efficiency of fintech M&As. Using event study analysis, we found that the announcement of fintech M&As generates a significant positive short-term abnormal return on public acquiring companies. Furthermore, we demonstrated that several macroeconomic parameters, including GDP growth, inflation rate, share of

services in GDP, and growth of aggregate export have positive effects on the abnormal returns. In contrast, private investment, consumer spending, and the size of an economy negatively influence fintech M&As outcome.

Keywords: Fintech; Financial innovations; Event study; Mergers and acquisitions

1. Introduction

In the economy of knowledge, digital technologies and innovations are among the key drivers of structural changes and the development of society. Over the past three decades, the implementation of digital technologies has significantly affected the way the financial services provision is organized (Ng et al., 2023; Kou et al., 2021; Phan et al., 2020; Thakor, 2020). In turn, these changes transform business processes in all other industries (Frame et al., 2018). In general, the use of technologies to produce financial products or services by both incumbents and new financial service providers results in the significant rise of cost-effectiveness, transparency, and quality of economic transactions (Didier et al., 2022; Kou et al., 2021). Over the last five years, the number of fintech startups more than doubled and reached 26,000 companies worldwide (Statista, 2023). These figures do not include companies that focused on the technological side of the fintech products as well as traditional financial institutions (Boot et al., 2021; Stulz, 2022).

The accelerating pace of fintech adoption forces companies to seek the internal and external sources of new knowledge and technology. Some companies pursue M&As to enhance their business models (e.g., Zheng & Mao, 2022). In this context, the M&A with a fintech firm can be considered as a channel of interorganizational technology transfer. Despite the importance of the analysis of the interaction between fintech industry agents, the performance of fintech M&As has received limited attention in empirical academic literature. Studies mainly focus on the impact of fintech-related events (partnership, investing, and alliances) for financial institutions (Carlini et al., 2022; Hornuf et al., 2021; Li et al., 2017).

The estimates of the performance of fintech M&As are mixed. A nascent but increasing number of research on market return of fintech M&As has revealed that for banks, the acquisition of fintech companies can destroy their short-term market value (Cappa et al., 2022; Collevocchio et al., 2023). Other studies demonstrate that if the scope of acquirers is not limited by banks, the fintech M&A is perceived by shareholders as a value-adding activity (Dranev et al., 2019). These mixed empirical results can be the outcome of the fintech-identification problem. According to Didier et al. (2022), since the fintech industry is a recent phenomenon, there is no generally accepted definition of “fintech” based on the specific set of technologies/financial services and products. While empirical research often applies standard industrial classification codes (e.g., Dranev et al., 2019; Zheng & Mao, 2022), such methodology has its own limitations. For example, when a financial company launches its own digital service, it may never adjust its industrial codes since its core business did not change. At the same time, in some countries, government financial support of innovations programs (e.g., Doh & Kim, 2014) and regulatory arbitrage (e.g., Buchak et al., 2018) stimulate new firms to be registered in technological industries. Thus, defining fintech companies is not straightforward, which creates additional measurement biases in empirical studies.

Moreover, most of M&A literature has discussed the impact of firm-level determinants on deal efficiency (Das & Kapil, 2012). The impact of macroeconomic determinants is usually discussed in the context of the growth of the whole M&A market (e.g., Boateng et al., 2014). However, since the distribution of fintech companies is not homogenous across countries, the access to capital and overall macroeconomic parameters may affect the short-term performance of M&As and explain the difference between the efficiency of deals. The prior literature has not comprehensively investigated this issue, despite its significance. As a result, company managers lack at understanding under which economic environment it is beneficial to engage in fintech acquisitions.

In response to the growing calls for further research on the fintech M&As (Li et al., 2017; Carlini et al., 2023) this study aim to investigate whether such deals have value creation potential for acquiring companies with undertaking an extended cross-sectional analysis. We use the event study methodology

to estimate the short-term market reaction to the 187 announcements of fintech M&A deals from public acquiring companies based in 25 countries. Unlike previous studies, we identify fintech M&As in accordance with the Crunchbase databases as a deal with the target firm from the financial technology industry (Dranev et al., 2019). This database focuses on providing information on innovative start-ups and companies and has become an important tool for fintech scholars (Haddad & Hornuf, 2019). Crunchbase database eliminates the fintech-identification problem since it defines fintech industry by employing a combination of data sources and advanced natural language processing (NLP) algorithms (Crunchbase, 2023). We collected data on fintech M&A deals between 2008 and 2021: this period covers the rapid transformation of the financial industry after the global financial crisis and the rise of financial technologies (Arner et al., 2015; Thakor, 2020). Then we use the regression analysis to estimate whether the stock market reaction varies with the changes in the macroeconomic environment. We add to the previous studies analyzing only firm-level determinants (e.g., Dranev et al., 2019; Cappa et al., 2022; Collevocchio et al., 2023). We capture the impact of macroeconomic determinants on the efficiency of fintech acquisitions. Thus, we expand the discussion of whether the investors' anticipation of the company's decision to engage in fintech M&As is influenced by macroeconomic conditions.

Our results indicate that the announcement of fintech M&A deals demonstrate significant positive short-term stock market reaction. Therefore, our findings reveals that corporate announcements of acquisition of fintech companies, on average, creates value for shareholders. Furthermore, we discovered that macroeconomic parameters, including GDP growth, inflation rate, share of services in GDP, and growth of aggregate export have positive effects on the abnormal returns.

The obtained findings provide a better understanding of the effects of fintech M&As on shareholder value for acquiring companies with undertaking an extended cross-sectional analysis. These results can help company managements and investors comprehend the consequences of corporate announcements. Given that only few studies attempted to estimate the impact of fintech M&As on the acquirer's performance, we complement additional evidence on fintech M&As (Dranev et al., 2019; Cappa et al., 2022; Collevocchio et al., 2023; Zheng & Mao, 2022 Carlini et al., 2022).

The study proceeds as follows. In Section 2 we develop the hypotheses. Section 3 describes the data and methodology used in this study. In Section 3 we present the results. We conclude with Section 5 by discussing our findings, their implications and the limitations of this research.

2. Hypotheses Formation

2.1. Stock market reactions to fintech M&As

While digital transformation affects each segment of the economy, companies seek new technologies to strengthen their competitive advantages. Companies accelerate their spending for modern technological solutions (Wang et al., 2022), and after the global crisis of 2008, this wave of digitalization rapidly changed the business environment in the financial industry (Thakor, 2020). Fundamentally, technological progress within the financial industry was generally associated with significant rise of cost-effectiveness and transparency of transactions (Ng et al., 2023; Phan et al., 2020; Thakor, 2020; Kou et al., 2021). Thus, fintech industry provides a wide range of viable alternatives to traditional financial services, including electronic payments services (Xia et al., 2023), crypto-assets (van der Linden & Shirazi, 2023), P2P lending platforms (Yan et al., 2015), and many others (e.g., Haddad & Hornuf, 2023; von Kalckreuth et al., 2022). Modern financial industry has become technologically driven, which implies that leaders in digital transformation usually create more shareholder value than digital laggards (Lamarre et al., 2023).

The digital transformation in a competitive environment creates additional challenges for the top-management. On the one hand, companies often invest resources into developing new services internally. On the other hand, many firms rely on M&As as a corporate strategy that can help to gain quick access to cutting-edge technologies or knowledge. Accordingly, over the past years, the fintech M&A market has significantly increased and remained promising despite recent global challenges (KPMG, 2023). Some companies employ fintech M&A strategy to improve their value-added services. For example, Visa Inc. has recently announced its intention to acquire processing platform Pismo with US\$1 billion of cash (Reuters, 2023). In 2021, the company acquired open banking platform Tink (US\$2.2 billion), as well as international payments provider Currencycloud (US\$925 million). Additionally, companies

acquire fintech firms in order to increase their addressable market. For instance, Nuvei Corporation has acquired the USA-based payments platform Paya Holdings Inc. for US\$1.3 billion to diversify its business (Paya, 2023). Besides, in several countries, fintech companies face fewer regulatory constraints than traditional institutions which creates opportunities of regulatory arbitrage for large acquirers (Cumming & Schwienbacher, 2018).

Although fintech M&As have received considerable attention from practitioners and regulators, the academic literature aimed at empirical investigation of the link between fintech M&A and shareholder value is scarce. Several studies have focused on the market value of fintech-related events (partnership, investing, alliances and M&As) for financial institutions and found mixed results due to different motivations (Hornuf, et al., 2021). Several empirical research studied the effects of banks' investment in fintech firms and documented negative link indicating that banks' shareholders value the development of fintech solutions rather than the acquisition of external ones (Carlini et al., 2022; Cappa et al., 2022; Collevicchio et al., 2023). At the same time, some studies found positive market value (Li, et al., 2017) implying that the investors are optimistic regarding possible complementarity between banks and fintech startups. Moreover, outside of the banking sector, there is strong evidence of positive market reaction to the acquisition of the fintech firms. Particularly, the research (Dranev et al., 2019) demonstrated positive abnormal return of fintech M&A transactions in the short-run. They also found that for acquiring companies from the developed countries, the Fintech M&As provide greater stock returns in comparison to the companies from the emerging countries.

In this study, we argue that the mixed empirical estimates of previous research can be the result of the biased identification of fintech companies. For example, several empirical studies identify fintech companies by the standard industrial classification codes (e.g., Zheng & Mao, 2022; Dranev et al., 2019). However, since the fintech industry is a relatively recent phenomenon, there is no specific industrial code. As a result, on many occasions, the industrial code does not match the core business activity of a fintech company. For instance, an established financial company which has recently started to develop its own digital services may never apply for industrial codes like software development because the core

business remains the same. In some countries, the informational technology sector receives subsidies, tax exemption, and other benefits, which motivates companies to associate with this sector. As a result, even in the UK, which is one of the world-leading centers of fintech start-ups, more than 50% of fintech companies are not covered by current standard industrial classification codes (Kalifa, 2021).

From the perspective of signaling theory, the announcement of fintech M&As could allow investors to evaluate companies under imperfect information (Tang et al., 2022). In this study, we argue that after the elimination of the identification problem, fintech M&As may serve as a strong positive signal to investors. The acquirers in such deals are predominantly related to either financial institutions, bigtech or fintech companies. This implies that these acquiring companies are competent in terms of technological or financial knowledge that can alleviate the possibilities of target misselection, overvaluing a target, and integration challenges post-M&A. Besides, fintech M&As could reduce the operational costs by providing cost-efficient solutions and services (Thakor, 2020). Therefore, fintech M&As are more likely to be value-adding activities and investors could re-evaluate companies' prospects in terms of future benefits that fintech M&A can provide. This implies an increase in stock prices. Hence, we propose our main hypothesis as follows:

H1: The fintech M&A positively affects the cumulative abnormal returns of the acquiring company in a short run.

2.2. Fintech M&As and macroeconomic determinants

In general, the macroeconomic environment affects the prospects of the fintech M&A market (KPMG, 2023). Several studies have examined the relationship between M&A market growth and interest rates (Uddin & Boateng, 2011), inflation (Evenett, 2004), exchange rate (Vissa & Thenmozhi, 2022), gross domestic product (GDP) (Ibrahim & Raji, 2018), institutional environment (Tao et al., 2017) and others (Kumar, et al., 2023). However, the primary focus of previous research was to investigate the impact of economic environment on growth of M&A market at aggregate level (e.g., Boateng et al., 2014). When examining the determinants of fintech M&A deals, some studies employ macroeconomic factors (Haddad & Hornuf, 2023). Others incorporate macroeconomic factors as control

variables while focusing on firm- and deal-specifics in fintech M&As (Das & Kapil, 2012). Nevertheless, when companies decide to engage in fintech M&A, macroeconomic factors are among key parameters that affect the reaction of investors. Most fintech companies are private and investors have to evaluate them by relying on limited information. Thus, shareholders adjust their investment strategy and anticipations according to the information they have access to (Pietrzak, 2023). Since the information on economic conditions is comparatively accessible (Song et al., 2021; Tzanaki et al., 2022), investors may estimate future gains from M&A by extrapolating recent macroeconomic trends, e.g., economic growth, aggregated demand for a particular type of products/services, and aggregated spending of different economic agents. However, even though changes in economic conditions may have an impact on stock returns (Fama & French, 1989), the link between the macroeconomic determinants and the M&A efficiency is underexplored.

Several research articles highlighted the importance of domestic economic conditions for M&A activity (Di Giovanni, 2005, Yang et al., 2023). One of the important determinants is the GDP growth rate which indicates the stage of the business cycle (Evenett, 2004). During economic uncertainty, fintech startups are forced to shutter or sell themselves to maintain their operations, making them favorable targets in terms of valuations (Wang & Villaluz, 2023). However, the market reaction could be negative due to concerns regarding the future of the economy (Vassalou, 2003; Kroencke, 2022). Since low GDP growth rate indicates economic downturn, we predict that the decrease of GDP has a negative impact on investors' expectations of future benefits. Additionally, in the economies with high inflation, investors could anticipate high stock returns to compensate against uncertainty (Choudhry, 2001). High inflation requires a higher nominal return implying that inflationary risks are reflected in returns. Thus, we propose that the higher the level of inflation, the higher will be the abnormal returns. Hence, we propose following hypotheses:

H2-1: The higher the GDP growth, the higher the abnormal returns of the acquiring company in a short run.

H2-2: The higher the level of inflation, the higher the abnormal returns of the acquiring company in a short run.

We also include in the model the recent trends in the behavior of three GDP components, namely consumption, investments, and government spending. The level of investments indicates how much new value added is invested, demonstrating how fast an economy can increase its aggregate income (UNSD, 2023). A rise in investments may result in the decline of interest rate, which provides lower cost of the overall transaction, making acquiring companies willing to engage in fintech M&As (KPMG, 2023). Hence, the level of private investments positively affects abnormal returns. Many governments incorporate digital technologies to deliver government services which transform its operations and processes (Malodia et al., 2021). Accordingly, the level of government spending on information and communication technology increases. Investors may have certain expectations towards the level of digital applications within an economy, which in turn affect the abnormal return on fintech M&A announcement. Therefore, the higher the level of government spending, the higher the abnormal return. Household consumption expenditure is one of the essential variables for the analysis of demand in the country and has a direct impact on companies' revenues (OECD, 2023). However, demand for fintech products is driven by companies (Yang & Zhang, 2022). Besides, a high level of consumption reduces savings, which in turn decreases investments. Thus, investors may react positively to the decline in consumption expenditure. Hence, we propose the following hypotheses:

H2-3: The higher the investments, the higher the cumulative abnormal returns of the acquiring company in a short run.

H2-4: The higher the government spending, the higher the cumulative abnormal returns of the acquiring company in a short run.

H2-5: The higher the consumer spending, the lower the cumulative abnormal returns of the acquiring company in a short run.

Other macroeconomic factors that could influence the perception of investors are the level of services in GDP, export, and the size of the economy. Service industries made major contributions to

economic growth, especially in developed countries (UNCTAD, 2019). Besides, IMF (2022) recommends to classify the fintech industry as a part of services within national statistics. Moreover, the main consumers of fintech products are service industries. Therefore, in countries with service-driven economies, investors will expect a greater return on acquisitions. The advent of financial technologies improves the accessibility of financial products (Philippon, 2019). On the one hand, applications of fintech facilitate financial operations, especially international transactions which are important in the global economy. On the other hand, the export growth implies an inclination to the external markets where fintech solutions can be scaled up to find consumers. With increasing levels of cross-border trade turnover, the fintech M&As announcements should receive positive reaction from shareholders. Finally, the size of the economy impacts fintech valuation and prospects of future cash flows for acquiring companies (Di Giovanni, 2005). Thus, we argue that a larger economy should have a positive impact on investors' reaction. Hence, we propose the following hypotheses:

H2-6: The higher the share of services in GDP, the higher the abnormal returns of the acquiring company in a short run.

H2-7: The higher the export growth rate, the higher the cumulative abnormal returns of the acquiring company in a short run.

H2-8: The larger the economy, the higher the abnormal returns of the acquiring company in a short run.

3. Methodology and data

3.1. Short-term Performance Analysis

According to the efficient market theory, the value creation of fintech M&A can be measured through stock return following the deal announcement (Tao et al., 2017). We employ the standard event study methodology to capture the investors' anticipation of transactions (Renneboog & Vansteenkiste, 2019). Cumulative abnormal returns (CARs) are estimated around fintech M&A announcement period by market model and market adjusted model. Short-term results are estimated for the $[0, 1]$ $[-1, 1]$, $[-3,$

3], [-10, 10], [-20, 20] event windows. The estimation period is 180 trading days prior to the event. The cumulative abnormal returns are calculated over the event period as follows:

$$CAR_i = \sum_{t=-T}^T AR_{it} \quad (1)$$

where AR_{it} is the abnormal return.

3.2. Regression Analysis

To estimate the impact of macroeconomic determinants on the cumulative abnormal returns of acquirers, we estimate the following specification of the model:

$$CAR_{d,y,c} = \beta_0 + \beta_1 GDPgr_{y,c} + \beta_2 Inflation_{y,c} + \beta_3 Igr_{y,c} + \beta_4 Ggr_{y,c} + \beta_5 Cgr_{y,c} + \beta_6 Services_{y,c} + \beta_7 EXgr_{y,c} + \beta_8 Pop_{y,c} + \sum \gamma_i Control_i \quad (2)$$

Table 1 presents the description of independent variables.

Table 1. List of Independent Variables

Name	Description
$GDPgr_{y,c}$	the real growth of GDP in constant prices at the y -year in c -country of acquirer
$Inflation_{y,c}$	consumer price index at the y -year in c -country of acquirer
$Igr_{y,c}$	growth rate during the past three years of gross capital formation in constant prices at the y -year in c -country of acquirer
$Ggr_{y,c}$	growth rate during the past three years of general government final consumption expenditure in constant prices at the y -year in c -country of acquirer
$Cgr_{y,c}$	growth rate during the past three years of household consumption expenditure (including NPISH) in constant prices at the y -year in c -country of acquirer
$Services_{y,c}$	the share of total value added (services) in GDP at the y -year in c -country of acquirer
$EXgr_{y,c}$	growth rate during the past three years of export of goods and services in constant prices at the y -year in c -country of acquirer
$Pop_{y,c}$	the size of the economy is proxied by the natural logarithm of the population (in millions) at the y -year in c -country of acquirer
$Control_i$	control variables for the age of target, experience of acquirer (the dummy variable which catches serial acquisition), and the year of the deal

3.3. Data Sample

To identify fintech M&As, we use Crunchbase database that focuses on providing information on innovative start-ups and companies. This database is applied in economic and managerial research (Dalle et al., 2017), as well as in fintech studies (Haddad & Hornuf, 2019). We identify fintech M&As

as transactions in which the target firm is from the financial technology industry. We retrieved data on fintech M&A deals between 2008 and 2021 (Figure 1 reports the distribution of fintech M&As by year). Thus, our research covers the inter-crisis period of the fintech industry’s tremendous growth. Some authors suggest that the new wave of financial technologies development started in 2008 due to undermined confidence in traditional financial institutions after the crisis and the rise of disruptive technologies (e.g., Arner et al., 2015; Thakor, 2020). We cut our data in 2021 because of the volatility on the financial markets from the beginning of 2022. Further, we restricted our initial sample by meeting the criteria that the acquiring company must be a public company. Additionally, we excluded deals where the event window includes more than one fintech M&A announcement from the company. Stock return data are obtained from Yahoo Finance. The source of macroeconomic data is UNCTADstat. Overall, our final sample covers 187 deals.

Figure 1. The distribution of fintech M&As by year

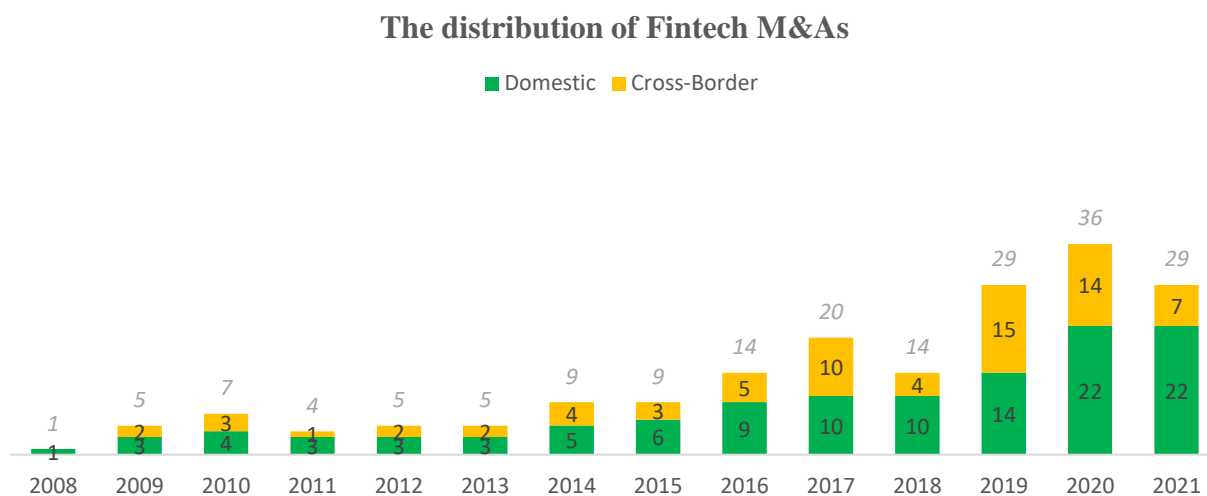


Table 2 shows the summary statistics of independent variables. The economic background of the deals in the dataset is very heterogeneous. For example, the GDP growth rate varies from -0.11 to 0.09 with an average of about 0.015. At the same time, the inflation rate also varies from -2.076 in Japan to 12.28 in Turkey. The role of services in the economy is high in the US, and the share of services in GDP is about 80%, while in Viet Nam services account for less than half of the GDP. Detailed list of countries are presented in the Appendix.

Table 2. Descriptive statistics of independent variables

Variables	Mean	Standard deviation	Minimum	1 st Quartile	2 nd Quartile (Median)	3 rd Quartile	Maximum
GDPgr	0.0153	0.0388	-0.1103	0.0079	0.0226	0.0291	0.0901
Inflation	2.0915	1.6445	-2.0761	1.2513	1.8128	2.5769	12.2789
Igr	0.0195	0.0455	-0.0937	0.0037	0.0195	0.0404	0.3223
Ggr	0.0168	0.0186	-0.0303	0.0090	0.0149	0.0229	0.0848
Cgr	0.0160	0.0192	-0.0321	0.0060	0.0242	0.0256	0.0813
Services	0.7416	0.0873	0.4247	0.6950	0.7918	0.8056	0.8133
EXgr	0.0109	0.0308	-0.0546	-0.0241	0.0162	0.0292	0.1780
Pop	5.0298	1.3092	-0.5170	4.2003	5.7936	5.8221	7.2515
TAge	12.3422	11.6964	2	6	10	16	110
Experience	0.1765	0.3822	0	0	0	0	1

Table 3 presents the correlation matrix for independent variables.

Table 1. Correlation analysis and multicollinearity.

	GDPgr	Inflation	Igr	Ggr	Cgr	Services	EXgr	Pop	TAge	Experience
GDPgr	1									
Inflation	0.4426 <i>0.0001</i>	1								
Igr	0.4632 <i>0.0001</i>	0.0021 <i>0.9773</i>	1							
Ggr	0.3299 <i>0.0001</i>	0.2388 <i>0.0009</i>	0.1235 <i>0.0921</i>	1						
Cgr	0.5884 <i>0.0001</i>	0.2497 <i>0.0005</i>	0.5172 <i>0.0001</i>	0.3973 <i>0.0001</i>	1					
Services	-0.0450 <i>0.5406</i>	-0.1225 <i>0.0947</i>	-0.0918 <i>0.2115</i>	-0.4773 <i>0.0001</i>	-0.1192 <i>0.1041</i>	1				
EXgr	0.2867 <i>0.0001</i>	-0.1681 <i>0.0215</i>	0.5020 <i>0.0001</i>	-0.1303 <i>0.0755</i>	0.3218 <i>0.0000</i>	-0.1908 <i>0.0089</i>	1			
Pop	0.1402 <i>0.0541</i>	0.2260 <i>0.0018</i>	0.0317 <i>0.6669</i>	-0.0028 <i>0.9697</i>	0.3556 <i>0.0001</i>	0.4113 <i>0.0001</i>	-0.0999 <i>0.1739</i>	1		
TAge	-0.0905 <i>0.2178</i>	-0.0763 <i>0.2991</i>	0.0365 <i>0.6203</i>	-0.0849 <i>0.2482</i>	-0.0072 <i>0.9220</i>	0.0447 <i>0.5439</i>	0.0973 <i>0.1851</i>	0.0685 <i>0.3519</i>	1	
Experience	-0.0978 <i>0.1827</i>	-0.1122 <i>0.1262</i>	-0.0495 <i>0.5011</i>	-0.0598 <i>0.4165</i>	-0.0585 <i>0.4267</i>	0.0979 <i>0.1827</i>	-0.0389 <i>0.5699</i>	0.0283 <i>0.7001</i>	0.1704 <i>0.0197</i>	1
VIF	2.3913	1.6885	1.7930	2.0772	2.4412	2.1381	2.1092	1.7154	1.0747	1.0523

Note: The table shows the Pearson correlation matrix between variables used in this study. In the matrix, each coefficient estimates the linear correlation between the two variables. P-value provided under each coefficient in italics. As the table shows, majority of coefficients are small and statistically insignificant. We note that p-value are less than 1% threshold level for coefficients that have a greater magnitude. We also report the variance inflation factor (VIF) to test for multicollinearity. For variables in this study, VIF is less than 3, indicating absence or low multicollinearity.

4. Empirical Results

Table 4 demonstrates the results of event study. Different CARs models are estimated over the short-term period. The results show that the fintech M&As provide significant abnormal returns to acquiring companies over [0, 1], [-1, 1], [-3, 3], [-10, 10], [0, 10], and [-20, 20] event windows by both

market model and market adjusted model. Short-term results for the event window of 41-trading days demonstrate weaker results.

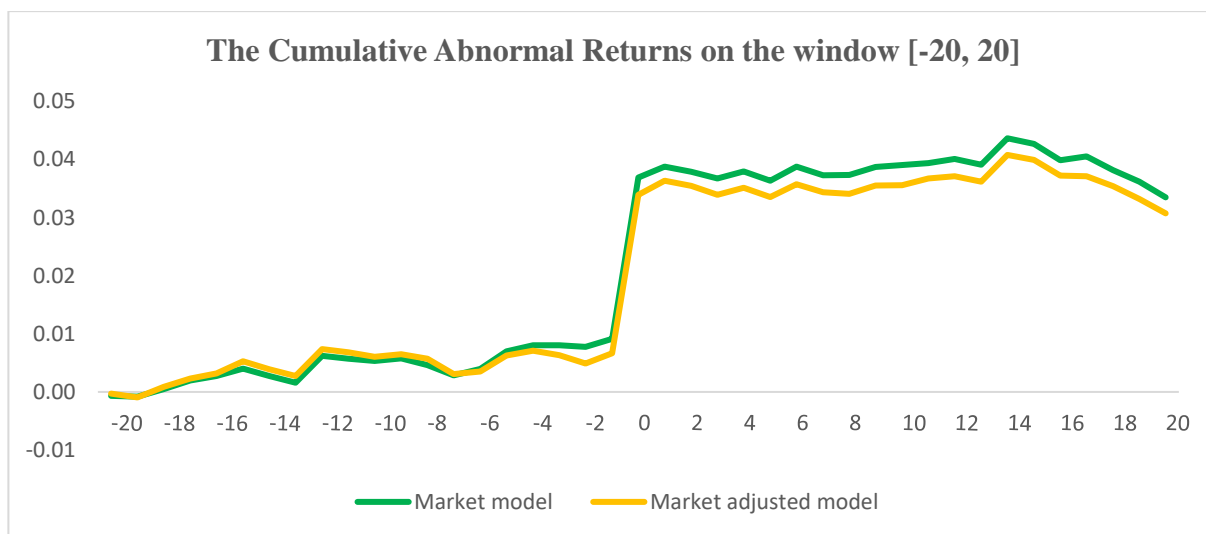
Table 2. CARs for Different Event Windows

Event window	Market model	Market adjusted model
CAR [-20, 20]	3.35% **	3.07% **
CAR [-10, 10]	3.33% ***	2.87% ***
CAR [-3, 3]	2.87% ***	2.68% ***
CAR [-1, 1]	3.10% ***	3.14% ***
CAR [0, 10]	2.98% ***	2,89% ***
CAR [0, 1]	2.96% ***	2.96% ***

Note: levels of significance (p-value) *p<0.1; **p<0.05; ***p<0.01

Overall, event study analysis reveals that the CARs are around 3%. Specifically, the CARs are 3.35% for the market model on the event window [-20, 20], and for the market adjusted model the CARs are 3.07% at 10% significance level. Figure 2 demonstrates the short-term results of the event study analysis on the event window of 41-trading days.

Figure 2. The CARs on the event window of 41-trading days



All models remain at the same level prior to the announcement of fintech M&As. Around the day of the announcement, the abnormal returns increase. From the first day and up to the fifteenth day, the range of the volatility of returns oscillates at approximately the same level. From the fifteenth day, there has been a steady decline in all returns. Moreover, within the event window of 3-trading days, the CARs for all models are positive and significant. Thus, there was a quick reaction from investors on the announcement of fintech M&As, which is consistent with previous findings (Dranev et. al, 2019). These

findings are also in line with the number of short-term even study research in M&As (Tao et. al, 2017). Therefore, the first hypotheses indicating that the fintech M&A positively affects the cumulative abnormal returns of the acquiring company in a short run cannot be rejected. The results suggest that fintech M&A deals provide abnormal return for the acquiring company which means that investors react positively to the announcement in the short-run.

Table 5 demonstrates the results for testing the hypotheses regarding the effect of macroeconomic determinants on market value of fintech M&As. The market models of CARs over [0, 1], [-3, 3], [-10, 10], and [0, 10] event windows have been tested.

Table 5. Regression results CARs for different event windows

Dependent Variable:	CAR [0,1]		CAR [-3,3]		CAR [-10,10]		CAR [0,10]	
	Coef.	P> t	Coef.	P> t	Coef.	P> t	Coef.	P> t
Intercept	-1,328	0,000	-1,390	0,000	-1,435	0,000	-1,440	0,000
GDPgr	4,769	0,001	4,361	0,006	4,070	0,008	4,071	0,006
Inflation	0,224	0,000	0,225	0,000	0,228	0,000	0,229	0,000
Igr	-1,253	0,083	-1,417	0,081	-1,379	0,078	-1,435	0,055
Ggr	0,839	0,681	1,472	0,519	1,565	0,477	2,093	0,321
Cgr	-6,568	0,001	-6,812	0,002	-6,723	0,002	-6,315	0,002
Services	0,653	0,053	0,673	0,075	0,632	0,083	0,725	0,038
EXgr	3,736	0,006	3,841	0,011	4,202	0,004	4,209	0,003
Pop	-0,047	0,013	-0,041	0,054	-0,032	0,109	-0,042	0,032
TAge	-0,001	0,737	-0,001	0,449	0,000	0,831	-0,002	0,346
Experience	0,044	0,385	0,035	0,536	0,049	0,378	0,062	0,241
Year dummies	Yes		Yes		Yes		Yes	
No. of mergers:	187		187		187		187	
R-squared:	0.568		0.518		0.546		0.568	
Adjusted R²	0.507		0.450		0.482		0.507	
F-Statistic (p-value)	9.326 (p<0.001)		7.605 (p<0.001)		8.532 (p<0.001)		9.323 (p<0.001)	
Note: The table displays the OLS regression results using cumulative abnormal returns (CARs) as the performance indicator. CARs are estimated by market return model on different short-term windows. The model is controlled for differences among countries and along years.								

The findings demonstrate that GDP growth and inflation are positive for all models at 1% level of significance. The real GDP growth rate provides information about national economic performance. The positive impact of GDP growth on the abnormal returns implies that with the increase in economic activities, investors anticipate positive returns of fintech M&As. In other words, investors' confidence and expectations for fintech M&As rise with GDP growth. Since the outcomes of such acquisitions have a high level of uncertainty, M&A activities during economic growth can have the lowest cost (e.g., Povel, Singh and Winton, 2007). Inflation also has a positive effect on abnormal return, which indicates that the real return on investments will be lowered by high levels of inflation and investors expect higher returns. The inflation rate affects capital cost, investment returns and firm's performance (Boateng et al., 2015; Boateng et al., 2017). However, companies from developed countries have advantages in financing and risk management capabilities with respect to M&As activities (Kumar, 2023). Firms engaging in fintech M&As mainly from developed countries and, thus, the increase in the inflation rate does not increase M&A abandonment. Moreover, high inflation can be mitigated with higher economic growth. Thus, hypotheses H2-1 and H2-2 cannot be rejected at 1% level of significance.

The findings indicate a negative effect of investment growth on market value of fintech M&As. This means that shareholders react positively when there is a decrease in investments. The results may reflect the industry specificities. Since firms engaging in fintech M&As are not from capital-intensive industries, the investment growth may signal the increase in business maintenance. Thus, hypothesis H2-3 is rejected at 10% level of significance. Since many governments support digitalization of public services, the positive effect of government spending is expected. The results demonstrate that the impact of government spending is positive but insignificant. Therefore, hypothesis H2-4 cannot be supported. The impact of consumption growth is negative and significant. Moreover, among several categories of users for fintech applications the solutions for business prevails. This finding indicates that investors do not consider household spending as the major demand for fintech applications. Hence, hypothesis H2-5 cannot be rejected at 1% level of significance.

The greater share of services in GDP demonstrates a positive effect on market value of fintech M&As for all specifications of models. Finance and information and communication technology (ICT) are among market service industries. The positive effect implies that the investors in service-based economies expect a greater return on fintech acquisitions. This result indicating that shareholders are confident in the value creating potential of fintech services. The hypothesis H2-6 cannot be rejected at 10% level of significance. The rise in export has positive effects on CARs. This implies that the export growth provides investors with greater anticipation of investment returns of fintech services. Hence, hypothesis H2-7 cannot be rejected at 1% level of significance. Finally, the population which is a proxy for the size of the economy has a negative impact on investors' reaction. Thus, hypothesis H2-8 is rejected at 1% level of significance.

5. Discussion and Conclusion

The aim of this study was to investigate whether fintech M&As is the value adding activity for acquiring companies, and to understand if the efficiency of fintech M&A varies with the macroeconomic variables. In doing so, this research makes important theoretical and practical contributions.

5.1. Theoretical contributions

Our first contribution is that we discovered the positive link between acquisition of fintech companies and short-term market reaction: the announcement of fintech M&A deals generates significant cumulative abnormal returns for different event windows. This finding is in line with some prior studies that examined the short-term fintech M&A performance (Dranev, et al., 2019), although the research on the acquirers from the banking sector provided negative results (Collevecchio, et al., 2023). At the same time, we avoided the fintech-identification problem by employing the Crunchbase database to find the target from the financial technology industry. The obtained results imply that, in general, financial markets consider the acquisition of financial technologies as an activity that increases the growth of wealth of the shareholders of the acquiring companies.

Second, we contribute to the discussion of how the macroeconomic environment affects the outcomes of fintech M&As. The rate of inflation has a positive effect on abnormal returns which

indicates that financial investors usually expect additional premium for the inflationary risk. We also found that the higher GDP growth rate, the higher the stock market returns. Investors adjust their expectations in accordance with the stage of the business cycle and associate expansion of the economy with the higher chances of efficient commercialization. The positive impact of share of services in GDP on market value of fintech M&As indicates that shareholders expect greater returns. Investors may positively associate future returns with the level of services for several reasons. On the one hand, a significant part of demand for fintech products belongs to businesses. On the other hand, fintech itself is a service, and the efficient utilization of new technology has higher chances in the service-oriented economy. Growing export capacities also have a positive effect on perception of fintech M&As by investors. The fintech industry provides solutions for quicker and secure cross-border transactions, which increase the speed and volumes of international trade.

Although we initially expected a positive effect of the size of the economy (proxied by population) on the possibility to scale the product within the domestic market, we found the negative relationship. This result may suggest that the size of the economy also increases the level of competition, and investors may have a modest expectation about future gains from commercialization of the absorbed technology. The investment growth has a negative effect on the market value of fintech M&As. Since the rise of aggregate investment in the economy leads to the decrease of interest rates, shareholders should expect lower return on their investments. Surprisingly, the consumption growth also has a negative effect on the outcomes of fintech M&As. The possible explanation for this result is that investors do not consider household spending as the major source of demand for fintech applications. Specifically, one of the reasons for companies to acquire financial technologies is to reduce operational costs, which usually does not affect consumers. Finally, we found a positive, but insignificant effect of government spending. This result could indicate that in general, the fintech industry is oriented toward the private sector of the economy. Moreover, the government-spending component of GDP includes a wide range of activities, and most of them do not affect the fintech industry.

5.2. Practical contributions

From a practical perspective, results of our research suggest that the acquisition of fintech companies can be beneficial for the firm. In particular, the discovered positive short-term market reactions to the announcements of deals indicate that firms should consider M&As as a way to obtain fintech service provision for creating value. Moreover, for the management of the company, the fintech acquisition can be a viable instrument for growth. For instance, fintech innovations can improve a firm's efficiency while maintaining risk (e.g. Fuster et al., 2019). This is only possible if the company management is aware of the required capabilities and organizational transformation for the successful outcome from the fintech deals. Otherwise, the cost of engaging in fintech M&As and integrational costs may substantially outweigh the potential benefits of the acquisition of fintech companies.

Furthermore, it is important to pay attention to the economic environment and plan the proper timing for the fintech M&A. During economic growth, the shareholders are confident in the future prospects of the firm, regardless of the outcomes of fintech M&A deals. Besides, when the economy is growing, and this growth is driven by the rise of the service sector, the firm has better chances to efficiently commercialize acquired technologies and products. Alternatively, shareholders' uncertainty rises with the economic downturn. Thus, when company management decides to engage in fintech M&A, they should take actions to boost investor's confidence. This would certainly be beneficial in reduction of uncertainty with respect to the company's ability to implement fintech services.

5.3. Limitations and further research

Our research has several limitations that may be addressed in future. First, the sample size was compiled from 187 fintech M&A deals with only publicly traded acquiring companies. It is by no means exhaustive or representative of the entire population of fintech M&A deals. Additionally, our sample does not distinguish acquirers, while it can be crucial in some cases: e.g., traditional banks and e-commerce companies may have different motivations to acquire the fintech firms. The difference in motivation may have an impact on the outcomes of the deal. Therefore, enhancing the sample size of fintech M&As including private acquiring companies has the potential to provide further useful insights.

Secondly, the focus of our regression analysis was on the aggregated economy-level variables. However, in the case of the fintech M&A analysis, it may be beneficial to introduce and discuss the effect of specific industry-related and firm-level variables. Besides, we investigated the impact of the macroeconomic variables during the relatively stable period. However, the impact of the economic parameters during the financial turmoil can be different. These limitations suggest further venues for further research.

Appendix

Table 1. The list of companies' countries participated in fintech M&As

Acquirer company country	Target company country
Australia	Australia
Brazil	Brazil
Canada	Canada
China	China
France	Cyprus
Germany	Estonia
India	Finland
Ireland	France
Italy	Germany
Japan	India
Republic of Korea	Ireland
Luxembourg	Italy
Netherlands	Japan
New Zealand	Kenya
Norway	Mozambique
Singapore	Netherlands
South Africa	Norway
Spain	Singapore
Sweden	South Africa
Switzerland	Spain
Türkiye	Sweden
United Arab Emirates	Switzerland
United Kingdom	Türkiye
United States of America	United Arab Emirates
Viet Nam	United Kingdom
	United States of America

References

Arner DW, Barberis J, Buckley RP (2015) The Evolution of Fintech: A New Post-Crisis Paradigm? University of Hong Kong Faculty of Law Research Paper No. 2015/047, UNSW Law Research Paper No. 2016-62. doi:10.2139/ssrn.2676553

Boateng, A., Du, M., Wang, Y., Wang, C., Ahammad, M. F. (2017) Explaining the surge in M&A as an entry mode: home country and cultural influences. *Int Mark Rev* 34(1):87-108.

Boateng A, Hua X, Uddin M, Du M (2014) Home country macroeconomic factors on outward cross-border mergers and acquisitions: Evidence from the UK. *Res Int Bus Finance* 30:202-216. doi:10.1016/j.ribaf.2013.08.001

Boateng, A., Hua, X., Nisar, S., Wu, J. (2015) Examining the determinants of inward FDI: Evidence from Norway. *Econ Model* 47:118-127. doi: 10.1016/j.econmod.2015.02.018

Boot A, Hoffmann P, Laeven L, Ratnovski L (2021) Fintech: what's old, what's new? *J Financ Stab* 53:100836. doi:10.1016/j.jfs.2020.100836

Buchak G, Matvos G, Piskorski T, Seru A (2018) Fintech, regulatory arbitrage, and the rise of shadow banks. *J financ econ* 130(3):453-483. doi:10.1016/j.jfineco.2018.03.011

Cappa F, Collevocchio F, Oriani R, Peruffo E (2022) Banks responding to the digital surge through Open Innovation: Stock market performance effects of M&As with fintech firms. *J Econ Bus* 121:106079. doi:10.1016/j.jeconbus.2022.106079

Carlini F, Del Gaudio BL, Porzio C, Previtali D (2022) Banks, FinTech and stock returns. *Finance Res Lett* 45:102252. doi:10.1016/j.frl.2021.102252

Choudhry T (2001) Inflation and rates of return on stocks: evidence from high inflation countries. *J Int Financ Mark Inst Money* 1(11):75-96. doi:10.1016/S1042-4431(00)00037-8

Collevocchio F, Cappa F, Peruffo E, Oriani R (2023) When do M&As with Fintech Firms Benefit Traditional Banks? *Br J Manag*. doi:10.1111/1467-8551.12701

Cumming D, Schwienbacher A (2018) Fintech venture capital. *Corp Gov: Int Rev* 26:374–389. doi:10.1111/corg.12256

Dalle JM, Den Besten M, Menon C (2017) Using Crunchbase for economic and managerial research. *OECD Science, Technology and Industry Working Papers* 8:1-29. doi:10.1787/6c418d60-en

Das A, Kapil S (2012) Explaining M&A performance: a review of empirical research. *J Strategy Manag* 3(5):284-330. doi:10.1108/17554251211247580

Di Giovanni J (2005) What drives capital flows? The case of cross-border M&A activity and financial deepening. *J Int Econ* 1(65):127-149. doi:10.1016/j.jinteco.2003.11.007

Didier Brandao T, Feyen EHB, Llovet Montanes L, Ardic Alper OP (2022) Global Patterns of Fintech Activity and Enabling Factors: Fintech and the Future of Finance Flagship Technical Note. World Bank Group Fintech and the Future of Finance report 170795(1): <http://documents.worldbank.org/curated/en/099735504212234006/P1730060695b370090908>

Doh S, Kim B (2014) Government support for SME innovations in the regional industries: The case of government financial support program in South Korea. *Res Policy* 43(9):1557-1569. doi:10.1016/j.respol.2014.05.001

Dranev Y, Frolova K, Ochirova E (2019) The impact of fintech M&A on stock returns. *Res Int Bus Finance* 48:353-364. doi:10.1016/j.ribaf.2019.01.012

Evenett S (2004) The cross-border mergers and acquisitions wave of the late 1990s. In: Baldwin R, Winters L (eds) *Challenges to Globalization: Analyzing the Economics*. University of Chicago Press. <http://www.nber.org/chapters/c9545>. Accessed 24 September 2023

Fama EF, French KR (1989) Business conditions and expected returns on stocks and bonds. *J financ econ* 1(25):23-49. doi:10.1016/0304-405X(89)90095-0

Fuster, A., Plosser, M., Schnabl, P., Vickery, J. (2019) The role of technology in mortgage lending. *Rev Financ Stud* 32(5):1854-1899.

Frame WS, Wall LD, White LJ (2018) Technological change and financial innovation in banking: Some implications for fintech. FRB Atlanta Working Paper No. 2018-11. doi:10.29338/wp2018-11

Haddad C, Hornuf L (2019) The emergence of the global fintech market: economic and technological determinants. *Small Bus Econ* 53:81–105. doi:10.1007/s11187-018-9991-x

Haddad C, Hornuf L (2023) How do fintech start-ups affect financial institutions' performance and default risk? *Eur J Finance* 15(29):1761-1792. doi:10.1080/1351847X.2022.2151371

Hornuf L, Klus MF, Lohwasser TS, Schwienbacher A (2021) How do banks interact with fintech startups? *Small Bus Econ* 57:1505-1526. doi:10.1007/s11187-020-00359-3

Ibrahim Y, Raji JO (2018) Cross-border merger and acquisition activities in Asia: The role of macroeconomic factors. *Stud Econ Finance* 2(35):307-329. doi:10.1108/SEF-06-2017-0146

IMF (2022) F.7 Impact of Fintech on Macroeconomic Statistics. <https://www.imf.org/-/media/Files/Data/Statistics/BPM6/approved-guidance-notes/f7-impact-of-fintech-on-macroeconomic-statistics.ashx>. Accessed 24 September 2023

Kalifa R (2021) The Kalifa Review of UK FinTech. <https://www.gov.uk/government/publications/the-kalifa-review-of-uk-fintech>. Accessed 24 September 2023

Kou G, Olgu Akdeniz Ö, Dinçer H, Yüksel S (2021) Fintech investments in European banks: a hybrid IT2 fuzzy multidimensional decision-making approach. *Financ Innov* 1(7):39. doi:10.1186/s40854-021-00256-y

KPMG (2023) Pulse of Fintech H1'23. <https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2023/07/global-pulse-of-fintech-h123-report-web.pdf>. Accessed 24 September 2023

Kroencke TA (2022) Recessions and the stock market. *J Monet Econ* 131:61-77. doi:10.1016/j.jmoneco.2022.07.004

Kumar D, Sengupta K, Bhattacharya M (2023) Macroeconomic influences on M&A deal outcomes: an analysis of domestic and cross-border M&As in developed and emerging economies. *J Bus Res* 161:113831. doi:10.1016/j.jbusres.2023.113831

Lamarre E, Chheda S, Riba M, Genest V, Nizam A (2023) The Value of Digital Transformation. Harvard Business Review. <https://hbr.org/2023/07/the-value-of-digital-transformation>. Accessed 24 September 2023

Li Y, Spigt R, Swinkels L (2017) The impact of FinTech start-ups on incumbent retail banks' share prices. *Financ Innov* 1(3):1-16. doi:10.1186/s40854-017-0076-7

Malodia S, Dhir A, Mishra M, Bhatti ZA (2021) Future of e-Government: An integrated conceptual framework. *Technol Forecast Soc Change* 173:121102. doi:10.1016/j.techfore.2021.121102

Ng E, Tan B, Sun Y, Meng T (2023) The strategic options of fintech platforms: An overview and research agenda. *Inf Syst* 2(33):192-231. doi:10.1111/isj.12388

OECD (2023) Household spending. <https://data.oecd.org/hha/household-spending.htm>. Accessed 24 September 2023

Paya (2023) Nuvei Enters Definitive Agreement to Acquire Paya. <https://paya.com/newsroom/paya-acquired-by-nuvei>. Accessed 24 September 2023

Phan DH, Narayan PK, Rahman RE, Hutabarat AR (2020) Do financial technology firms influence bank performance? *Pac Basin Finance J* 62:101210. doi:10.1016/j.pacfin.2019.101210

Philippon T (2019) On fintech and financial inclusion. National Bureau of Economic Research No.26330. doi:10.3386/w26330

Pietrzak M (2023) What can monetary policy tell us about Bitcoin? *Ann Finance* doi:10.1007/s10436-023-00432-3

Povel, P., Singh, R., Winton, A. (2007) Booms, busts, and fraud. *Rev Financ Stud* 20(4):1219-1254. doi: 10.1093/revfin/hhm012

Renneboog L, Vansteenkiste C (2019) Failure and success in mergers and acquisitions. *J Corp Finance* 58:650-699. doi:10.1016/j.jcorpfin.2019.07.010

Reuters. (2023) Visa \$1 billion buyout of Brazil's Pismo eases fintech M&A slowdown. <https://www.reuters.com/markets/deals/visa-acquire-brazilian-fintech-pismo-1-billion-cash-2023-06-28/>. Accessed 24 September 2023

Song S, Zeng Y, Zhou B (2021) Information asymmetry, cross-listing, and post-M&A performance. *J Bus Res* 122:447-457. doi:10.1016/j.jbusres.2020.08.035

Statista (2023) Number of fintech startups worldwide from 2018 to 2023, by region. <https://www.statista.com/statistics/893954/number-fintech-startups-by-region/>. Accessed 24 September 2023

Stulz R (2022) FinTech, BigTech, and the Future of Banks. *J Appl Corp Finance* 4(31):86-97. doi:10.1111/jacf.12492

Tang H, Fang S, Jiang D (2022) The market value effect of digital mergers and acquisitions: Evidence from China. *Econ Model* 116:106006. doi:10.1016/j.econmod.2022.106006

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. *Int Bus Rev* 1(26):189-202. doi:10.1016/j.ibusrev.2016.06.006

Thakor AV (2020) Fintech and banking: What do we know? *J Financ Intermediation* 41:100833. doi:10.1016/j.jfi.2019.100833

Tzanaki A, Alekseeva L, Azar J (2022) Common ownership in fintech markets. In: Stylianou K, Iacovides M, Lundqvist B (eds) *Fintech Competition: Law, Policy, and Market Organisation*. Bloomsbury Hart. doi:10.2139/ssrn.4267062

Uddin M, Boateng A (2011) Explaining the trends in the UK cross-border mergers & acquisitions: An analysis of macro-economic factors. *Int Bus Rev* 5(20):547-556. doi:10.1016/j.ibusrev.2010.11.003

UNCTAD (2019) *Effective Market Access for Least Developed Countries' services exports*. <https://unctad.org/publication/effective-market-access-least-developed-countries-services-exports>. Accessed 24 September 2023

UNSD (2023) The United Nations Statistics Division. <https://unstats.un.org/unsd/snaama/Metadata/Glossary>. Accessed 24 September 2023

van der Linden T, Shirazi T (2023) Markets in crypto-assets regulation: Does it provide legal certainty and increase adoption of crypto-assets? *Financ Innov* 9(1):22. doi:10.1186/s40854-022-00432-8

Vassalou M (2003) News related to future GDP growth as a risk factor in equity returns. *J financ econ* 1(68):47-73. doi:10.1016/S0304-405X(02)00248-9

Vissa SK, Thenmozhi M (2022) What determines mergers and acquisitions in BRICS countries: Liquidity, exchange rate or innovation? *Res Int Bus Finance* 61:101645. doi:10.1016/j.ribaf.2022.101645

von Kalckreuth U, Wilson N, Girón C, Kochanska U, Buthiot E, Wicky Y, Luis ÁM, Santos, R. (2022) Fintech in statistical classifications: suggestions and tentative figures in a central bank context. In: 11th Biennial IFC Conference on “Post-pandemic landscape for central bank statistics”, BIS, Basel, 25-26 August 2022. https://www.bis.org/ifc/publ/ifcb58_30.pdf. Accessed 24 September 2023

Wang J, McGarrity L, Prabhakaran S, Holm Møller T (2022) How can your digital investment strategy reach higher returns? https://www.ey.com/en_gl/strategy/digital-investment-report. Accessed 24 September 2023

Wang Y, Villaluz G (2023) Fintech M&A Deal Tracker: Building a pipeline as slowdown persists. <https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/fintech-m-a-deal-tracker-building-a-pipeline-as-slowdown-persists-76534285>. Accessed 24 September 2023

Xia H, Gao Y, Zhang J Z (2023) Understanding the adoption context of China’s digital currency electronic payment. *Financ Innov* 9:63. doi:10.1186/s40854-023-00467-5

Yan J, Yu W, Zhao JL (2015) How signaling and search costs affect information asymmetry in P2P lending: the economics of big data. *Financ Innov* 1:19. doi:10.1186/s40854-015-0018-1

Yang T, Zhang X (2022) FinTech adoption and financial inclusion: Evidence from household consumption in China. *J Bank Financ* (145):106668. doi:10.1016/j.jbankfin.2022.106668

Zheng H, Mao M (2022) Fintech Mergers and Acquisitions. Available at SSRN 4291498, 1-48. doi:10.2139/ssrn.4291498