

STOCK MARKET REACTION TO BANK-FINTECH M&A

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Abstract

Since the global financial crisis, banks have experienced a period of strong disruptions, first and foremost the rapid diffusion of fintech. In recent years, forms of open innovation between traditional banks and fintech companies have increased dramatically and, among them, M&A have gained momentum. Nonetheless, previous research has focused mainly on less pervasive forms of Open Innovation, and it is not clear if these transactions are good for banks. This research addresses this gap by analyzing the impact of fintech acquisitions on the bank acquirer performance. We adopt the event study methodology, focusing on the contingency factors that affect M&A effects on acquirer bank performance. Findings show that acquirer sustainability, deal characteristics, as well as institutional context, influence the post-acquisition performance, suggesting that banks can foster sustainable innovation by acquiring fintech firms following specific characteristics. Such holistic approach focusing on the firm, deal and institutional context level advances the scientific understanding of the effects of Open Innovation in banking sector and also provide managers with first indications about which factors positively affect the performance of the acquirer.

Keywords: Open Innovation, Sustainable Innovation, Fintech, Banking, Institutions.

1. Introduction

The globalization and rapid digitization characterizing the last decades have shifted the focus from a closed approach to innovation to the new paradigm of Open Innovation (OI) (Chesbrough, 2003). Chesbrough defined OI as “the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and to expand the markets for external use of innovation, respectively” (Chesbrough et al., 2006, p. 1). The high dynamism that increasingly characterizes the company’s environments makes access to new external knowledge essential in order to maintain its competitive position in the market. This is even more true in the banking sector, which has undergone a profound transformation in recent years. Digitalization has profoundly shifted consumer habits, turning to open services that are always and easily accessible. In the financial sector, it prompted the development of new models that facilitate access to financial services to a broader audience (Alt & Puschmann, 2012; Gulamhuseinwala et al., 2015), leveraging the emergence of new players in the market, where fintech companies have been affirmed as the new financial technology proposition which is disrupting traditional banks, affecting their performance and practices (Alt et al., 2018; Arner et al., 2016; Gomber et al., 2017; Y. Li et al., 2017; Nair & Menon, 2017). This transformation has been particularly disruptive for banks, as the change in digital preferences has been accompanied by the loss of saver confidence due to the financial crisis, that has brought to the forefront the need for sustainable financial solutions (Armstrong et al., 2012; Lauesen, 2013; Muniesa & Lenglet, 2013). In order to respond to these challenges, traditional banks need to adopt an outward-looking approach for innovating their business model and meeting new market needs (Ramdani et al., 2020). Recognizing this, banks have begun to consider the acquisition of fintech a valuable strategy to capture the necessary technology and know-how, under the view of Open Innovation. Indeed as highlighted by CB Insight (2018) the number of banks M&A with fintech firms has been raising recently. Indeed, technological mergers and acquisitions (M&A) may represent a useful and rapid mean of inbound open innovation to absorb external ready-to-go knowledge (Dezi et al., 2018;

Gondim et al., 2017; Shin et al., 2017). Although several studies started to analyze forms of collaboration between banks and fintech (Drasch et al., 2018; Hornuf et al., 2020), it has been overlooked the effects of fintech M&A, moreover without focusing on acquiring banks (Dranev et al., 2019). Thus, there is still no evidence to explain the outcome of such transactions for banks. In particular, as in other Open innovation practices (Cappa et al., 2019), it has to be understood in the peculiar context of fintech M&A which are the contingency factors that allow to have a positive effect on acquirer performance. To bridge the gap, this article attempts to answer the following question: when do fintech acquisitions positively impact on the bank acquirer performance?

To fully understand the performance effect of fintech M&A, we contend that a holistic approach that considers three main aspects of the transaction is needed: 1) firm-specific factors, 2) deal characteristics, and 3) the environmental context where companies operate. Regarding the former, we argue that sustainability scores are relevant especially in the current attention towards grand challenges. Concerning deal characteristics, the type of acquisition, i.e., whether full or partial, is crucial as a proxy of the integration level between buyer and target. Finally, we evidenced how the institutional distance plays a role in the acquirer's performance.

By proposing a holistic approach of analysis, which addresses different levels of the deal, our study contributes to shedding light on a very promising context for banks that is still little explored, i.e. fintech. In so doing, the article expands the existing literature about OI and M&A, and enriches the understanding about the contingencies that allow M&A with fintech be beneficial for acquiring bank. In so doing we also provide first empirical indications to managers about the effects for acquiring bank performance. The remainder of the paper is as follows: in the next section we present the theoretical framework and discuss the contingent factors that can positively impact the performance of the acquiring bank. Section 3 describes the methodology used to test the hypotheses. In section 4, the results of the analysis are presented, which confirm the hypotheses by highlighting that specific characteristics of the acquirer, the deal and the reference environment impact the acquirer bank performance. These results are then discussed in Section 5, where the theoretical and managerial

implications of the study are highlighted. Finally, the Conclusions summarize the contribution of our study and present limitations and future research directions.

2. Theoretical background and hypotheses development

2.1 The evolution of the banking sector and the rise of fintech

In the last decade, there has been a profound transformation in the financial sector driven by several reasons, such as the global financial crisis of 2008, the consequent increasing regulation of incumbent financial institutions, the shift of customer needs and behavior, and the proliferation of fintech startups (Alt et al., 2018; Alt & Puschmann, 2012; Nicoletti, 2017). The global financial crisis of 2008 pointed out the unsustainability of the financial system, representing a turning point in the financial services evolution trend (Arner et al., 2016). The instability of the banking system called for broad-based intervention by regulation, resulting in greater rigidity of banks which have steadily slowed down lending to both companies and individuals. Moreover, the financial crisis deteriorated trust in traditional banks, thus fostering a change in consumer behaviors, already pushed by digitalization, that shifted customer demand, especially from the younger generation of digital natives, towards user-friendly, ever accessible, and customized solutions (Pousttchi & Dehnert, 2018). It fostered financial disintermediation, leading to an ever-increasing open approach to financial services (Adhami et al., 2018; Cappa et al., 2020; Cappa & Pinelli, 2020; Gomber et al., 2018; I. Lee & Shin, 2018; Martovoy & Dos Santos, 2012; Mention et al., 2014; Nambisan et al., 2019; Pollari & Ruddenklau, 2018; Ramdani et al., 2020), towards the development of “Open Finance” advocated by the UK FCA (Hallsworth, 2020; Mills, 2019). After the crisis, growing attention to sustainability issues has strongly affected the financial sector, where increased transparency and more sustainable innovations are expected (Armstrong et al., 2012; Hilmi, 2018). It is therefore evident that “customers redefine the rules of the game” (Hedley et al., 2006, p. 51), representing a particularly daunting challenge for traditional banks. Indeed, relying on outdated business models conceived for passive depositors

satisfied with standard and predefined solutions, they have been unable to meet these new needs of increasingly informed and active customers (Nicoletti, 2017).

This transformative scenario has led to the development of a large number of fintech startups, which have established themselves as critical active players which directly address the market (M. Wright et al., 2016), marking the transition towards 'Fintech 3.0' (Arner et al., 2016). Fintech was raised from the marriage between financial services and technology. It represents the central innovation driver in the financial industry (I. Lee & Shin, 2018), which facilitates accessing and managing financial resources by leveraging advanced digital technologies, thus revolutionizing how financial services are carried out. The Financial Stability Board (FBS) defines fintech as "technology-enabled innovation in financial services that could result in new business models, applications, processes, or products with an associated material effect on the provision of financial services" (Financial Stability Board, 2019). Such a broad and generic definition reflects well the ambiguity of fintech, which refers to several categories, such as cybersecurity, mobile transactions, data analytics, blockchain, peer-to-peer (P2P) lending, robo-advising, IoT, etc. (M. A. Chen et al., 2019). Following the definition of fintech outlined by Bull et al. (2019, p. 9), i.e. "organizations that combine innovative business models and technology to enable, enhance and disrupt financial services", it would seem that even non-financial companies that provide technologies and software for enhancing financial services could be considered fintech. Indeed, technological advancements have increasingly blurred the sector boundaries, as evidenced by Big Techs' entry into financial services by acquiring banking licensing, e.g., Amazon, Google, Facebook, and Apple. (EY, 2020; Stulz, 2019). As a result, competition is no longer restricted among the few large traditional banks but involves many new players that can better reach customers through digitalized business models. As reported by a survey conducted by PWC, 55% of bank executives view nontraditional players as a threat to traditional banks (Sullivan et al., 2019).

Fintech firms have proliferated, attracting significant investments worldwide that have increased more than tenfold since 2010, reaching about \$160 billion in 2019 (Statista, 2021). This considerable

growth strongly disrupted traditional banks, which have gradually lost clients switching to fintech. As reported by the last EY's Global Fintech Adoption Index, fintech services' adoption has steadily moved upward from 16% in 2015 to 64% in 2019 (Bull et al., 2019). Such fintech success lies in the matching between supply and demand through digitalized business models, which allow to increase efficiency in delivering financial services, on the one hand, and personalize offerings, on the other (e.g. Alt & Puschmann, 2012; Gai et al., 2018; Y. Li et al., 2017; Parameshwar et al., 2019). According to Gulamhuseinwala et al. (2015), the main reasons for using fintech services are ease of use, cost savings, higher rates, accessibility to different services, better online experience, and better quality. Furthermore, fintech solutions offer numerous benefits in terms of flexibility by allowing access to transactions anytime and anywhere (Anshari et al., 2019).

2.2 Banks M&As with fintech firms

While banks initially believed that fintech was a fad, they soon had to change their minds, recognizing the potential of fintech transformation. Traditional banks have therefore begun to see fintech not only as disruptive competitors to be fought but also as potential collaborators from whom to acquire knowledge and technologies necessary to meet the new market demands. Indeed, as suggested by the model developed by Boustani (2020, p. 354), the transition to the future banks is via fintech. Hence, traditional banks have been looking outwards to innovate by developing many forms of collaboration with fintech entities (Hornuf et al., 2020), embracing the new paradigm of open innovation, previously only very narrowly applied to the financial services sector (Gianiodis et al., 2014; Martovoy et al., 2015; Martovoy & Dos Santos, 2012; Salampasis et al., 2015). Although some studies have begun to investigate the phenomenon, the literature is still very scarce and further research is necessary to understand the impact of bank-fintech interactions broadly. In their recent article, Hornuf et al. (2020) examine the various forms of collaboration that banks engage with Fintechs in four different countries (Canada, UK, France, and Germany), showing that banks generally prefer product-based collaborations over acquisitions, which may be a particularly complex

way to internalize financial innovation. Nonetheless, fintech M&A trend has significantly grown during the last years, accounting for more than two-thirds of global fintech investments in 2019, with a total value of 97.3 billion (Pollari & Ruddenklau, 2020).

Despite suffering from a higher degree of complexity, M&A represents a speedy solution that allows an immediate impact on bank innovation, both in terms of product and process (Adner & Levinthal, 2001). Concerning process innovation, acquisition enables the development and exploitation of synergies across assets, achieving economies of scale and scope (Singh & Montgomery, 1987). Moreover, the acquisition allows for the integration of new external knowledge and expertise as well as the access to new technologies that lead to a reconfiguration of the firm's technological portfolio, thus facilitating the development of new products/services (Ahuja & Katila, 2001; Ferraris et al., 2017; Shin et al., 2017). Consistent with these arguments, Dranev et al. (2019) studied fintech-focused M&A carried out by companies operating in different industries and found that such transactions positively impact acquirer performance, highlighting that specific deal characteristics are particularly relevant. However, no study has yet focused on fintech acquisitions conducted by banks, which require special attention due to their unique characteristics (Finger et al., 2018; Miralles-Quirós et al., 2019) and the strong complementarities between fintech and traditional banking (Y. Li et al., 2017; Navaretti et al., 2017). Fintech M&A may be a particularly positive strategy for traditional banks as it not only allows them to acquire technologies and absorb fintech's knowledge base to bridge the significant existing digital gap, it also helps to quickly recover the demand lost due to the massive shift of consumer preferences. Indeed, by integrating fintech's digital business model, banks can overcome their typical marketing myopia (Egan & Shipley, 1995; Levitt, 2004), developing customer-oriented digital offering and building a more interactive and personalized model of interaction with customers (Nicoletti, 2017). Moreover, the acquisition of fintech firms would allow traditional banks to move towards more sustainable innovations. In fact, fintech has strong potential in terms of sustainability (Arner et al., 2020; Deng et al., 2019). Fintech technologies have an impact in terms of economic sustainability for both companies and customers. On the one hand, digital

models allow increasing the efficiency of traditional financial institutions by significantly lowering operating costs (Yang Wang et al., 2021). At the same time, fintech allows for much cheaper solutions for savers. Furthermore, as the deVere Group's CEO Nigel Green stated, it "benefit society" by fostering greater financial inclusion and pushing towards the so-called democratization of finance (Arner et al., 2020; Baber, 2019; Block, 2014; Deng et al., 2019; Erturk et al., 2007; Gleasure & Feller, 2016). Several scholars showed that fintech could contribute to constructing a more equitable society alleviating discrimination in mortgage market (e.g. Haddad & Hornuf, 2019) and significantly affect economic growth (Malmendier, 2009). In this sense, on top of M&A being a form of OI, the particular context of fintech acquisition may be seen as a form of Open Sustainable Innovation, i.e. the exploitation of open innovation paradigm to enhance sustainability (Arcese et al., 2015; Cappa et al., 2016).

However, although the acquisition of fintech has important potential benefits, it entails high integration complexity that the bank may not be able to handle (Steigenberger, 2017). The new technologies may be perceived as overly disruptive by the bank. Further, the misalignment of approaches can make the integration between the traditional bank model and the modern fintech model particularly tough (Le Floch & Scaringella, 2017). Previous literature on M&A highlights divergent results on the acquirer's performance, suggesting that not all M&As create value for the acquirer (Meglio, 2009; Thanos & Papadakis, 2012). Actually, the outcome depends on several specificities of the transaction, such as deal characteristics, firm characteristics, and environment (A. Das & Kapil, 2012). Therefore, it is essential to understand which specific factors positively influence the performance of the bank acquiring fintech. In order to do so, this paper adopts a holistic approach that focuses on three different levels of analysis: 1) acquirer characteristics, i.e., the acquirer bank sustainability, 2) deal characteristics, i.e. full vs. partial acquisition, and 3) the institutional environment, i.e. institutional distance between the acquiring bank and the target fintech.

2.3 Acquirer sustainability

Sustainability has been an important concern in recent years, especially in the banking sector. The role of intermediation and facilitating access to credit makes banks critical players in society, performing their fundamental function as catalysts for economic growth (Nizam et al., 2019). As they operate at the heart of the economic system (Pooranam & Nandhini, 2018), civil society is increasingly concerned about how banks fulfill their goals, asking them to be increasingly transparent and involved in stakeholder value creation (Lauesen, 2013). In other words, banks are asked to adhere to the ‘doing well by doing good’ proposition, widely discussed in the literature (e.g. Chernev & Blair, 2015; Eichholtz et al., 2010; Falck & Heblich, 2007; Key & Popkin, 1998). The call for more sustainable financial innovation after the global financial crisis (Armstrong et al., 2012; Muniesa & Lenglet, 2013) has prompted banks to place particular emphasis on sustainability issues by integrating environmental, social, and governance (ESG) criteria (Deloitte, 2019).

Much research points out that integrating sustainable practices has multiple benefits for the company. Responsible behavior allows companies to manage better relationships with stakeholders, increasing their trust and confidence (Alareeni & Hamdan, 2020; Barnett & Salomon, 2012; Miralles-Quirós et al., 2019), that are key factors in the banking sector, attracting customers (Mackey et al., 2007). According to the stakeholder theory (Freeman, 1984), effective management of stakeholder relationships yields social impact that leads to a competitive advantage sustainable over time. Because the ESG effort is indicative of the bank’s stakeholder focus, it may be vital in the fintech integration process. The bank will be interested in sustainably harnessing the potential of fintech to create value for all stakeholders, resulting in a greater appetite for change. Indeed, several studies suggest that there is a positive relationship between ESG and the company’s innovative performance (Broadstock et al., 2019; Forcadell et al., 2019; Zhang et al., 2020), as the concern for sustainability shifts the focus to the concept of shared value creation (Porter & Kramer, 2019) which bases on an open perspective that can foster a greater flow of knowledge among players.

Moreover, ESG commitment has a significant impact in decreasing business risk (Buallay, 2019; Di Tommaso & Thornton, 2020; D. D. Lee & Faff, 2009; Sassen et al., 2016), which may be translated

into higher bank's performance. Although banks are naturally exposed to high risk, as they provide long-term loans by raising short-term funds through deposits, the excessive risk is extremely harmful because it makes the banking sector highly vulnerable, as demonstrated by the 2008 crisis (Brunnermeier, 2009). Therefore, banking risk is a crucial issue in the context of financial sustainability, as it has significant aggregate consequences for society, and sustainable financial innovation perspective requires banks to have a 'focus on precaution' seeking to mitigate risk (Armstrong et al., 2012; Muniesa & Lenglet, 2013). Di Tommaso and Thornton (2020) analyzed the impact of ESG on risk-taking and value of European banks, finding that high ESG scores are associated with a reduction in bank risk-taking, and this impact has an indirect positive effect on value. The bank's responsible attitude can thus ensure a more outstanding commitment to managing the risks associated with M&A of knowledge-intensive firms (Coff, 1999) and balancing the fintech risk-taking propensity, given the higher risk appetite characterizing the high-tech sector (J. Li & Tang, 2010; Ragozzino, 2006). Therefore, the announcement of a fintech acquisition by a bank with a high commitment in ESG can be a good signal provided by the market.

However, investments in sustainability incur high costs to the banks (Nizam et al., 2019), limiting the potential benefit so much that performance can even be adversely affected. For low levels of ESG, the costs incurred do not justify the expected benefits leading to potential value destruction for the bank (Azmi et al., 2021). In fact, investing in sustainability involves "waste" of resources that are then diverted out of other more crucial activities (Di Tommaso & Thornton, 2020). Cappucci, analyzing the "ESG integration paradox", argued that "if not implemented wholeheartedly, responsible investing can lead to lower financial returns" (Cappucci, 2018, p. 22). Hence, for low levels of sustainability, the marginal costs may exceed the marginal benefits. Consistent with this view, several studies found a non-linear relationship between ESG and firm performance (Azmi et al., 2021; Barnett & Salomon, 2012; Birindelli et al., 2018; Nollet et al., 2016), suggesting that banks should invest at least a certain amount in ESG in order to overcome this trade-off hypothesis (Miralles-Quirós et al., 2019). Indeed, only by investing heavily in sustainability banks will be

credible, and the market will recognize their efforts. Beyond a certain level of ESG they will then be able to appropriate the benefits mentioned above and marginal benefits will exceed marginal costs. Thus, we argue that to be truly committed towards sustainable innovation that will allow to fully benefit from the acquisition of fintech, the bank must deeply integrate ESG criteria. Therefore, we hypothesize the following:

Hypothesis 1: Acquirer sustainability has a U-shaped effect on post-M&A performance.

2.4 Full vs. partial acquisition

Full and partial acquisitions differ in terms of complexity, risk, and expected synergies, resulting in different strategic implications (e.g. Kim, 2012; Reuer et al., 2004; Yi Wang & Larimo, 2020). Previous literature showed that M&A transactions are susceptible to the post-acquisition integration process, which is often the main reason for their failure (Bauer & Matzler, 2014; Jemison & Sitkin, 1986; Ranft & Lord, 2002). When the acquisition is made in knowledge-intensive industries, such as fintech, the integration process is even more problematic as it involves transferring tacit knowledge (Chi, 1994). In such situations, a partial acquisition can be particularly suitable as it leaves the fintech a stake in the acquired company, thus facilitating the transfer of technological knowledge (S. F. S. Chen & Hennart, 2004). In addition, the technological industry is characterized by high growing, dynamism, and fast-paced innovation, resulting in a trade-off between uncertainty and opportunity (Mchawrab, 2016). In this context, full acquisitions can be overly expensive as they require significant resources that are riskily deployed due to technological uncertainty (Folta, 1998). Ahammad et al. (2017) argued that partial acquisitions can economize the cost of resource commitment and contain any negative consequences due to uncertainty. Traditional banks are often unprepared to handle such volatility due to their technology gap and structural rigidity. Therefore, a partial acquisition may be a preferable solution as it requires less financial commitment from the bank and allows it to take advantage of the greater fintech flexibility. Furthermore, a partial acquisition leaves a higher degree of autonomy to the target (Spencer et al., 1998), allowing it to develop

innovative products without being cannibalized by the acquirer. Hence, a partial acquisition allows the bank to benefit from the acquisition of fintech to move towards sustainable financial innovation.

Hypothesis 2: A partial acquisition positively affects the acquirer's performance.

2.5 *Institutional distance*

Institutional theory (North, 1990) has been a widely adopted lens for analyzing cross-border M&A since the 1990s. According to this theory, the institutional context deeply affects companies that may be empowered or constrained by different institutions (Martin et al., 2007), with direct consequences on firms' strategy and performance (Garrido et al., 2014; Konara & Shirodkar, 2018). The globalized world pushes toward increasing companies' openness beyond national borders, operating in countries with heterogeneous institutional environments. Since the middle '90s, the increasingly frequent cross-border M&A has prompted many scholars to explore the impact of institutional distance (ID), firstly introduced by Kostova (1997), on post-acquisition performance, leading to conflicting conclusions. Formal institutional distance (FID) refers to the magnitude to which countries differ from one another in terms of formal institutions, i.e., the aggregate set of sociopolitical regulatory processes that establish, monitor, and enforce rules (North, 1990). While existing research has mainly focused on the negative effects of ID (e.g. Dong et al., 2019), relying on the so-called "liability of foreignness" (Hymer, 1976), on the other hand, some studies show that it positively affects long-term post-acquisition performance (M. Du et al., 2016; W. Li et al., 2020). Indeed, formal institutional differences can be exploited to gain an advantage through the so-called institutional arbitrage (Boisot & Meyer, 2008; Clausen, 2014; Gaur & Lu, 2007; Jackson & Deeg, 2008; Yi et al., 2020). It refers to the opportunity to benefit from institutional contexts that are more favorable for developing certain activities in the value chain (Gaur & Lu, 2007). Indeed, companies can benefit from more flexible policies that improve their productive efficiency (Bhaumik & Dimova, 2013). Through institutional arbitrage, banks can benefit by buying fintech firms that operate in different institutional environments, thus subject to different policies and rules.

Recent research evidenced that institutional arbitrage also favors innovation (Clausen, 2014; Rosenbusch et al., 2019; Yi et al., 2020). According to the open innovation paradigm (Chesbrough, 2003), innovation is enhanced when firms span their boundaries to search for knowledge among external actors. Li et al. (2020) argue that ID favors knowledge accumulation because knowledge is embedded in the institutional environment (Qiu et al., 2017). Therefore, institutional arbitrage can be seen as “an innovation search strategy” (Clausen, 2014, p. 395). Following this view, ID may foster innovation as institutional differences offer greater opportunities to acquire new knowledge in addition to the know-how of the acquired fintech company, representing an even more excellent opportunity for banks. Therefore, fintech M&A can be a remarkably positive sign for the market, as it bodes well for the bank’s future innovation power.

Hypothesis 3: Institutional distance positively affects the acquirer’s performance.

3. Methodology

To test our hypotheses, we employ the event study methodology (MacKinlay, 1997). It measures the effect of the announcement of an unanticipated event on stock prices and it is widely used to analyze M&A performance (Boubaker & Naoui, 2020; Chkir et al., 2020; Datta et al., 2013; Dranev et al., 2019; Hossain et al., 2016; Kolaric & Schiereck, 2013; Lusyana & Sherif, 2016; Patel & King, 2015; Rahman et al., 2018; Yadav & Aggarwal, 2017). The event study methodology is based upon the fundamental assumption of market efficiency (Fama, 1970), which implies that all available information is incorporated into stock prices. When this hypothesis is verified, stock prices are considered an efficient proxy of the actual company’s value and, consequently, Cumulative Abnormal Returns (CARs) that occurred close to the event announcement reflect the potential value recognized by investors in the strategic decision to undertake M&A (Haleblian et al., 2009). Therefore, in order to analyze the effect of fintech M&A and determine the contingent factors that allow value creation for the acquirer banks, we examined bank’s CARs around the deal announcement.

First of all, we determined the abnormal returns (ARs), which, under the market efficiency hypothesis, are assumed to reflect the stock market reaction to the event announcement (McWilliams & Siegel, 1997). They are calculated as the difference between the effective returns, i.e., those that have actually occurred as a result of the disclosure event, and expected stock returns, i.e., those that would have occurred in the absence of such an event:

$$AR_i = R_i - ER_i$$

where: $ER_i = \beta_i R_m$

Expected returns are calculated through the market model approach (Brown & Warner, 1980), considering the MSCI index as market benchmark. Following Cappa et al. (2019), the systematic risk (coefficient β_i) of stock i was measured as the slope of the linear regression between the firm's returns and the returns of the reference market index calculated in the window (-250; -30) concerning the announcement date. In order to check for robustness, we also calculated CARs with an alternative benchmark, i.e. the national stock market index (robustness checks are reported in Appendix). Abnormal returns were then accumulated to calculate CARs using different event windows through the following formula:

$$CAR_i = \sum_{-K}^{+K} AR_i$$

3.1 Sample

Thomson Reuters database was used for getting data for empirical analysis since, as suggested by Barnes et al. (2014), it is the best database for M&A research.

The sample consists of M&A deals announced by worldwide Banks between 2010 and 2020. Data were collected until March 2020 so as to avoid any transactions that might be due to the pandemic crisis. Due to the recent rapid development trend of fintech (Deloitte, 2018), the chosen period is significant for the analysis. Indeed, new fintech startups addressing the market autonomously began to spread since the global financial crisis, representing direct competitors of banks (Arner et al., 2016)

and, according to the Accenture Fintech Innovation Lab, as from 2010 fintech investments have been significantly grown (Skan et al., 2016).

Only deals announced by acquirer banks with available RIC codes were considered in order to be able to integrate the dataset by collecting further valuable data. From the available 5856 completed deals, we focused our analysis only on fintech-M&A. We identified the target fintech through the content analysis of the business description provided by Thomson Reuters. Although other research on this field refers to the SIC code to identify fintech companies (Dranev et al., 2019), we believe that due to the blurred industry boundaries where they operate, referring to the business description is a more accurate way to distinguish fintech vs. non-fintech firm. More in detail, we defined some keywords to distinguish fintech from other types of targets, as reported in Table 5 in Appendix.

We found a total of 107 bank-fintech M&A announced over the last decade, in line with other recent studies on this topic (Asmarani & Wijaya, 2020; Dranev et al., 2019).

From the available sample, we then discarded those deals for which complete information was missing. Therefore, the final sample on which the OLS regression was run consists of 60 observations. Despite being small, the sample is representative of the totality of fintech acquisitions made by banks, and its size is sufficient to conduct a statistically significant analysis. In fact, it is in line with the sample size used in other papers examining fintech (Y. Li et al., 2017) and satisfies the limit of five observations per variable (Hair et al., 2010).

3.2 *Dependent variable*

According to several studies on post-M&A performance (Bhaumik & Selarka, 2012; Leepsa & Mishra, 2012; W. Li et al., 2020; Thompson & Kim, 2020; F. Wang et al., 2018), we used CAR as the dependent variable to measure the acquirer's performance, calculated as the sum of abnormal returns in the five-day event window around the announcement date, from t-2 to t+2:

$$CAR_i = \sum_{-2}^{+2} AR_i$$

We chose this five-days event window because, apart from being frequently used (Cai & Sevilir, 2012; N. Das et al., 2020; Masulis et al., 2007; Mikhail et al., 2004; Uysal et al., 2008; Yang et al., 2019), it captures a major part of the total stock price effects (Cai & Sevilir, 2012). Moreover, it meets the length criteria outlined by McWilliams and Siegel (1997). Indeed, on the one hand, it is sufficiently long to capture the significant effect of the event as well as any possible information leaks by being not contaminated by transitory price fluctuations; on the other, it is short enough to avoid incurring the “confounding effect”, i.e. the inability to isolate the effect of the relevant event from those of other events (N. Das et al., 2020).

3.3 *Explanatory variables*

3.3.1 *ESG Score*

Due to the widespread application of ESG indicators in academic research (e.g. Dorfleitner et al., 2020; Drempevic et al., 2020; Dyck et al., 2019; Garcia et al., 2017; Mervelskemper & Streit, 2017; Sassen et al., 2016), in recent years leading international data providers, such as Thomson Reuters and Bloomberg, begun to develop in-house specific ESG scores. In this study, we measured the banks’ sustainability commitment through the ESG score provided by Thomson Reuters, based on the self-reported information in the environmental, social, and corporate governance pillars.

3.3.2 *Partial acquisition*

In order to verify the second hypothesis, we added a dummy variable (*partial*) assuming value 1 if the acquiring bank buys partial ownership (<100%) of the target fintech, 0 otherwise (Ahammad et al., 2017; Chari & Chang, 2009).

3.3.3 *Institutional distance*

Institutional distance (ID) is a widely used variable in cross-border M&A literature (Bhaumik et al., 2018; X. J. Du & Zhu, 2013; W. Li et al., 2020; Van Hoorn & Maseland, 2016; Zhu et al., 2015). It is gauged as the absolute value of the difference between the institutional level of the acquirer bank and that of the target fintech. To measure the institutional level, we referred to the Worldwide

Governance Indicators (WGI) provided by the World Bank, which include aggregate indicators across more than 200 countries for six governance dimensions: Voice and accountability; Political stability and absence of violence; Government effectiveness; Regulatory quality; Rule of law; and Control of corruption. WGI are often used in institutional research (Askarzadeh et al., 2020; Bhaumik et al., 2018; Dikova, 2009; Konara & Shirodkar, 2018; Kostova et al., 2020; W. Li et al., 2020; Van Hoorn & Maseland, 2016) due to their comprehensiveness and availability. We retrieved all indicators for the period 2010-2019, assuming that for the first three months of 2020 the value was the same as last year.

In order to generate a single value of institutional level for each country, we carried out principal component analysis (Yakubu, 2020), considering the first principal component of the six dimensions as a proxy of institutional quality level.

3.4 Control variables

Following prior literature, we included control variables at both acquirer and target levels in order to account for other factors that have power in explaining abnormal buyer returns. Regarding the former, we controlled for the bank's risk, size, and M&A experience. According to Brealey et al. (2019), the outcome of an acquisition can be affected by the bank's diversification of systematic risk. Therefore, we used the *beta* coefficient to control for the bank's risk (Bozos et al., 2013; Brealey et al., 2019; Tampakoudis et al., 2021). We also control for bank size as it may affect the bank's post-M&A performance (Berger et al., 1998). Following several studies, we measure size as the natural logarithm of total assets (*ln_asset*) (Beccalli & Frantz, 2009; Caiazza et al., 2012; Janahi et al., 2021; Liu et al., 2012). M&A experience has been largely used as control variable in previous research since it affects M&A outcomes (e.g. Uhlenbruck et al., 2006; Yi Wang & Larimo, 2020; P. Wright et al., 2002). Indeed, acquisition experience fosters the acquirer's ability to unlock more synergies and manage the M&A process more effectively, thus implementing its acquisitions more successfully from the start

(e.g. Barkema & Schijven, 2008). *Experience* is gouged as the number of effective M&A completed in the five years before the announcement date.

In addition, we control for fintech-specific factors that may impact post-M&A performance. Pezzi (2018) showed that target age strongly influences the acquirer performance in high-tech industries, as younger firms offer more opportunities to create value. Hence, we control for age of the target fintech (*target_age*) at the time of the announcement date, measured as the number of years since the incorporation date of the target fintech. Lastly, we added dummies to control for *target region*.

Table 2: Descriptive statistics

Variable	Mean	Std. Dev.	Min	Max
CAR[-2;+2]	-0.01	0.03	-0.13	0.05
ESG	61.01	23.22	11.84	93.96
ESG ²	4253.05	2571.35	140.13	8829.36
partial	0.56	0.50	0	1
ID	0.36	0.69	0	3.37
beta	1.11	0.66	-0.81	2.88
ln_asset	27.19	2.24	21.85	34.80
experience	9.56	11.48	0	81
target_age	15.62	15.38	0	81
Africa, Middle East, or Central Asia	0.02	0.13	0	1
Asia Pacific Excluding Central Asia	0.15	0.36	0	1
Europe	0.28	0.45	0	1
Japan	0.44	0.50	0	1
North America	0.05	0.22	0	1
South America	-0.01	0.03	-0.13	0.05

4. Analysis and Results

We ran the OLS regression to test all our hypotheses through the following model:

$$CAR(-2; +2) = \alpha_0 + \alpha_1 ESG + \alpha_2 ESG^2 + \alpha_3 partial + \alpha_4 ID + \alpha_5 beta + \alpha_6 lnAsset + \alpha_7 experience + \alpha_8 age + \alpha_9 region + u_{it}$$

As a first step, we test for possible multicollinearity between variables by performing the correlation analysis (Table 2). The results show correlation coefficients below 0.7, denoted by Mela and Kopalle (2002) as the cut-off point indicating a high probability of multicollinearity. We also performed the Variance Inflation Factor (VIF) test (results in Appendix) to double-check for multicollinearity

(Cappa et al., 2020; Franco et al., 2020). Results show VIF values lower than 10 for all independent variables, thus confirming that no multicollinearity issues are evidenced in our study (Gujarati & Porter, 2009).

Then, we ran the OLS regression using the Heckman two-step model to control for selection bias (Heckman, 1979). This procedure is appropriate given the absence of multicollinearity among the variables (Nawata, 1994). We control for potential endogeneity concerns because the decision to acquire a fintech firm, and therefore the likelihood of an observation to appear in the sample, may be endogenous. To control for such a selection bias, we introduced an exclusion restriction variable that does not appear in the second stage and, thus, does not influence the dependent variable (Certo et al., 2016), i.e. *intangibles*. Intangible assets, such as human, technological, and know-how, are strategic assets (Amit & Schoemaker, 1993) that play a critical role as a source of innovation and facilitators of innovation processes, thus affecting OI (Grimaldi et al., 2017; Le et al., 2019). Since intangible assets represent the result of internal R&D activities (Le et al., 2019), they can be a good proxy for the innovation effort of acquirer banks, which may prefer technological and knowledge-intensive acquisitions in order to accelerate its innovation performance.

Results are reported in Table 3, in four separate models which added the explanatory variables one at a time. The coefficient of ESG is negative and significant ($p < 0.01$), while that of ESG^2 is positive and significant ($p < 0.01$), confirming the existence of a non-linear relationship between ESG and bank's performance. Nevertheless, Haans et al. (2016) argued that, although necessary, significant opposed coefficients are not sufficient to establish a quadratic relationship. We then employed the U-test proposed by Lind and Mehlum (2010) which verifies the necessary conditions, namely that the slope of the lower bound is negative and significant while the slope of the upper bound is positive and significant, as well as that the extreme point falls within the interval. Results (Table 4) provide evidence of the significance of the U-shaped relationship between ESG and acquirer performance, supporting Hypothesis 1.

Moreover, there was a significant positive relationship between *partial* acquisition and CAR ($p < 0.1$) and that supports Hypothesis 2, suggesting that it is more convenient for banks to acquire only partial ownership of the target fintech.

Finally, institutional distance (*ID*) positively affects the bank's performance, with a significance level of 5%. This result is consistent with our arguments and provides support for Hypothesis 3.

To check for robustness of our model, we also examined a shorter event window after the event day (0; +2) as well as the same event window calculated on a different benchmark market (national stock market index), and results hold. Besides, we also conducted a plain OLS without Heckman (Cappa et al., 2020; Cassar, 2004) and again findings hold (results of the robustness checks are reported in Appendix).

Table 3: Correlation

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) CAR[-2,+2]	1													
(2) ESG	0,068	1												
(3) partial	0,085	0,339	1											
(4) ID	-0,012	0,288	0,150	1										
(5) beta	-0,161	0,087	-0,020	0,227	1									
(6) ln_asset	-0,144	0,447	0,253	0,237	0,188	1								
(7) experience	-0,102	0,307	-0,091	0,306	0,375	0,325	1							
(8) target_age	0,448	-0,171	0,075	-0,141	-0,168	-0,097	-0,108	1						
(9) Africa, Middle East, or Central Asia	-0,020	-0,032	0,103	-0,128	-0,230	-0,299	-0,077	0,217	1					
(10) Asia Pacific Excluding Central Asia	-0,090	0,263	0,132	-0,035	-0,058	0,473	-0,060	0,093	-0,090	1				
(11) Europe	0,211	0,378	0,125	0,183	0,077	0,018	0,143	0,093	-0,163	-0,244	1			
(12) Japan	-0,016	-0,365	0,134	-0,100	-0,037	0,295	-0,059	0,162	-0,057	-0,085	-0,153	1		
(13) North America	-0,094	-0,228	-0,328	-0,031	0,071	-0,297	-0,017	-0,361	-0,215	-0,321	-0,579	-0,202	1	
(14) South America = o,	-0,033	-0,252	0,048	0,013	0,111	-0,033	-0,038	0,055	-0,047	-0,070	-0,126	-0,044	-0,166	1

Table 4: Regression Model

VARIABLES	Model 1	Model 2	Model 3	Model 4 - Full
ESG		-0.00241** (0.00109)	-0.00307*** (0.00110)	-0.00325*** (0.00106)
ESG ²		0.00002*** (0.00001)	0.00003*** (0.00001)	0.00003*** (0.00001)
partial			0.02001** (0.00956)	0.01740* (0.00929)
ID				0.01158** (0.00539)
beta	-0.01069 (0.00933)	-0.02046*** (0.00619)	-0.01808*** (0.00609)	-0.02027*** (0.00595)
ln_asset	-0.00044 (0.00324)	0.00061 (0.00379)	0.00313 (0.00385)	0.00276 (0.00371)
experience	-0.00019 (0.00064)	0.00005 (0.00037)	-0.00005 (0.00036)	0.00001 (0.00035)
target_age	0.00090 (0.00029)	0.00044 (0.00031)	0.00040 (0.00030)	0.00038 (0.00029)
Africa, Middle East, or Central Asia	-0.02957 (0.04069)	-0.02749 (0.03842)	-0.02968 (0.03707)	-0.02337 (0.03586)
Asia Pacific Excluding Central Asia	-0.01603 (0.03644)	-0.03001 (0.02060)	-0.03451* (0.01999)	-0.02688 (0.01959)
Europe	0.01809 (0.03302)	-0.00870 (0.01931)	-0.01246 (0.01871)	-0.01109 (0.01805)
Japan	-0.00715 (0.04427)	-0.01776 (0.02983)	-0.04405 (0.03139)	-0.03760 (0.03041)
North America	0.00500 (0.03316)	-0.00801 (0.01852)	0.00156 (0.01843)	0.00348 (0.01779)
South America = o,	-	-	-	-
Constant	0.03794 (0.18290)	0.04604 (0.12932)	-0.05085 (0.13334)	-0.02629 (0.12891)
Heckman - Fintech M&A				
Intangibles/TotAsset	0.00000*** (0.00000)	0.00000*** (0.00000)	0.00000*** (0.00000)	0.00000*** (0.00000)
acq_experience	-0.00298 (0.00346)	-0.00036 (0.00347)	-0.00036 (0.00347)	-0.00036 (0.00347)
Constant	-2.08940*** (0.05249)	-2.29776*** (0.06238)	-2.29776*** (0.06238)	-2.29776*** (0.06238)
Observations	4,474	4,445	4,445	4,445
Selected	60	60	60	60
Rho	-0.311	-0.0907	0.447	0.337
Sigma	0.0551	0.0271	0.0287	0.0265
Lambda	-0.0171	-0.00245	0.0128	0.00891
SE(Lambda)	0.0501	0.0230	0.0236	0.0227
Wald Chi2	16.42	31.51	38.24	45.78
Prob > Chi2	0.0585	0.000914	0.000141	1.55e-05

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5: U-test

Test for the U-shaped curve. t-values are in parentheses.
 *** p<0.01, ** p<0.05, * p<0.1

Group	Lower bound	Upper bound
Interval	11.837	93.965
Slope	-0.0026*** (-2.93) t-value	0.0023*** (3.61) P-value
Overall test	2.93	0.0017
Extreme point	55.04	

5. Discussion

In agreement with previous studies (Alt et al., 2018; Boustani, 2020; Hornuf et al., 2020; Nicoletti, 2017; Pousttchi & Dehnert, 2018; Stulz, 2019), our analysis shows that integration with fintech can bring significant benefits for banks. Indeed, based on open innovation theory (Chesbrough, 2003), we argued that acquiring fintech can be a proper OI strategy to foster bank's innovation as it allows banks to acquire external technology and know-how to move towards sustainable financial innovation.

Our findings show that the market seems to respond positively to fintech acquisitions when they have specific unique characteristics, in line with what has been argued by previous studies (e.g. A. Das & Kapil, 2012). In particular, the acquirer bank's ESG, the amount of fintech's ownership acquired, and the institutional distance are important factors affecting the acquirer bank's performance. Acquirer's sustainability, measured through the ESG score, has a non-linear impact on the acquisition performance. Indeed, the relationship is initially negative and then becomes positive when the level of ESG exceeds a certain threshold. This result is consistent with the U-shaped effect of ESG found by other scholars (Azmi et al., 2021; Nollet et al., 2016), suggesting that banks need to overcome such a threshold in order to gain the benefits and that fintech acquisition creates value when highly sustainable banks undertake it. In such a case the bank will be able to manage better risks arising from the high uncertainty of high-tech acquisitions (Coff, 1999; Di Tommaso & Thornton, 2020; J. Li &

Tang, 2010; Ragozzino, 2006) and to fully exploit the innovative potential of fintech sustainably, since ESG positively influences innovation (Broadstock et al., 2019; Forcadell et al., 2019; Zhang et al., 2020), overcoming the costs and efforts resulting from high investments (Cappucci, 2018; Nizam et al., 2019). On the contrary, low ESG values cannot stimulate a concrete commitment to sustainable innovation and are not perceived positively by the public, thus representing only a cost that results in lost resources (Di Tommaso & Thornton, 2020).

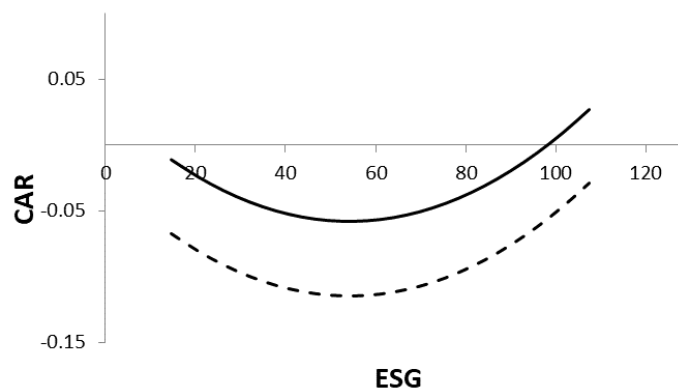
Moreover, results show that partial acquisitions create more value for the acquirer bank rather than full M&A (Roy, 1985). By buying only partial stakes, banks are able to handle the technological uncertainty characterizing fintech (Ahammad et al., 2017; Folta, 1998). In addition, we hypothesized that a partial acquisition could foster fintech innovation development as it guarantees greater autonomy to the acquired entity (Spencer et al., 1998), therefore representing a good signal of the potential future innovativeness of the bank.

Finally, findings also provide evidence for the third hypothesis, showing that a greater institutional distance is positive for bank's performance. We argued that institutional arbitrage is key for the success of cross-border fintech M&A. Indeed, moving towards markets that are very distant in terms of formal institutions, it is possible to exploit regulatory and normative differentiation, taking advantage of them (Boisot & Meyer, 2008; Clausen, 2014; Gaur & Lu, 2007; Jackson & Deeg, 2008; Yi et al., 2020). Institutional arbitrage can be particularly useful in the process of acquiring fintech firms, where banks face a fundamental trade-off between regulatory rigidity, aimed at ensuring transparency and security, on the one hand, and flexibility to be able to innovate, on the other. By acquiring fintech operating in different institutional environments, banks can balance this trade-off and gain higher financial returns.

Looking at the results as a whole, they show that open innovation through M&A is not always beneficial for banks. According to previous research about contingency factors that allow OI to be positive for firm performance (Cappa et al., 2019; Casprini et al., 2017; Chesbrough, 2012; Hosseini et al., 2017) we have identified the factors that allow to have an overall positive effect on firm

performance. It depends on contingent factors, the so-called “boundary conditions” (Busse et al., 2017), that influence the transaction’s outcome. Indeed, it is possible to identify two extreme situations: when the sustainability of the acquirer is very low, and a total acquisition is made of a fintech operating in the same institutional environment, the CAR is negative (-0.034); when, on the contrary, a very sustainable bank partially acquires a fintech operating in a very distant institutional environment, the CAR is positive (+0.012) (Figure 1).

Figure 1: Relationship between ESG and CAR



The dotted line shows the relationship between ESG and CAR when other variables are not included. The solid line, instead, represents the relationship between ESG and CAR when the effects of *partial* and *ID* are also incorporated in the constant.

This work makes several contributions to both research and practice. First, the study contributes to expanding the literature of fintech and how it impacts the banking industry through M&A which, although they have reached momentum (CB Insights, 2018), have not yet been thoroughly examined among bank-fintech forms of collaboration (Hornuf et al., 2020). Besides, our findings offer a holistic view of bank-fintech M&A by addressing different levels of deal analysis. Thus, the study provides interesting insights into the contingency factors that enable banks to create value through integration with fintech firms. By focusing on the boundary conditions that influence M&A with fintech, our study also helps to expand the open innovation literature, which has generally focused on different OI practices (Dezi et al., 2018), and helps to fill the gap related to the uncertainty of firms’ openness, answering, albeit in part, the demand for deeper insights into the boundary conditions that determine OI success or failure (Bogers et al., 2018; Chesbrough & Bogers, 2014). Furthermore, the paper

applies the Institutional Theory (North, 1990) as a lens to examine the open innovation transactions pursued by banks through the acquisition of companies with great innovative potential, providing evidence that institutional distance may favor bank-fintech M&A. In so doing, the paper adds important evidence to the literature on OI by highlighting that formal institutions influence the outcome of such practices, with consequences in terms of innovation and performance.

This research provides relevant implications for practice, pointing out that managers must consider multiple factors when acquiring fintech. Results show that acquiring fintech can be a good strategy for banks to foster sustainable innovation and it allows to create value under certain conditions. In particular, the sustainable commitment of banks can benefit M&A outcomes as it fosters sustainable innovation. However, engaging in responsible activities is not enough, and banks need to make a special effort in ESG to capture the benefits. Thus, managers who intend to move towards sustainable financial innovation by acquiring fintech must be aware of the need to reach high ESG performance to reach the threshold effect. Moreover, the study pointed out that the choice of the amount of ownership is crucial, and bank managers need to take into account that, despite the lower control, partial acquisitions allow to exploit the full innovative potential of fintech. Finally, the paper offers helpful advice for managers making cross-border acquisitions, suggesting that institutional distance can be a source of gain through institutional arbitrage.

6. Conclusions

Fintech M&A is an open innovation strategy that may boost the bank's digital transition. In this paper we have proposed a holistic approach to analyzing the impact of fintech acquisition on banks' performance. Our findings suggest that the outcome of fintech acquisitions for banks depends on contingent factors that cut across multiple levels of analysis: the characteristics of the firm, the deal, and the relevant institutional environment. More in details, this study provides new insights into when fintech acquisition can be a beneficial open innovation strategy to lead sustainable innovation, finding that the acquirer bank's sustainability, the amount of ownership acquired, and the institutional

distance between the bank and the fintech are key factors affecting the M&A performance. This study is not exempt from limitations that suggest avenues for future developments.

First, because of the difficulty in gathering data for the target, as many are not listed, our study only examines the level of acquirer sustainability. However, fintech sustainability may be equally crucial in the post-acquisition integration process. Indeed, our study looks at just a few factors that may affect the transaction outcome, and further research may include target's features in the analysis. Moreover, to examine the influence of institutional distance, we only focused on formal institutions. Therefore, future studies may add informal institutions into analysis in order to test for cultural distance. Finally, further research could test whether these results hold by adopting methodologies other than the event study, looking at accounting indicators, and it would also be interesting to see the effect of these operations on the actual innovation produced in the years following the acquisition.

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Appendix

Table 5: List of keywords for fintech companies' identification

<ul style="list-style-type: none">• Digital payment• Online payment/s• Digital money transfer• Digital finance• Financial software• Digital investment/s• Digital security/ies• Financial engine/s• Robo advisor/s or robo advisory or Robo advising• Digital advisor/s or digital advisory• Online investment/s• Financial technology/ies	<ul style="list-style-type: none">• Digital insurance• Digital wealth• Crowdfunding• Digital borrowing• P2P lending or peer-to-peer lending• Initial Coin Offering or ICO• Security Token Offering or STO• Token• Crypto• Blockchain• Big data• fintech
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Table 6: OLS Regression Model

VARIABLES	Model 1 CAR[-2;+2]	Model 2 CAR[-2;+2]	Model 3 CAR[-2;+2]	Model 4 - Full CAR[-2;+2]
ESG		-0.00287** (0.00121)	-0.00333*** (0.00118)	-0.00359*** (0.00116)
ESG ²		0.00002** (0.00001)	0.00003*** (0.00001)	0.00003*** (0.00001)
partial			0.02339** (0.01040)	0.02135** (0.01020)
ID				0.01184* (0.00633)
beta	-0.01399 (0.01532)	-0.01629** (0.00723)	-0.01373* (0.00704)	-0.01586** (0.00696)
ln_asset	-0.00009 (0.00439)	0.00418 (0.00315)	0.00484 (0.00304)	0.00494 (0.00297)
experience	-0.00043 (0.00105)	0.00023 (0.00043)	0.00008 (0.00041)	0.00015 (0.00041)
target_age	0.00222*** (0.00044)	0.00057 (0.00036)	0.00053 (0.00035)	0.00051 (0.00034)
Africa, Middle East, or Central Asia	-0.01164 (0.06271)	0.03470 (0.04586)	0.04921 (0.04454)	0.05216 (0.04345)
Asia Pacific Excluding Central Asia	0.01151 (0.05053)	0.02061 (0.02783)	0.03578 (0.02758)	0.03937 (0.02696)
Europe	0.07809 (0.05266)	0.05177* (0.02928)	0.06760** (0.02900)	0.06490** (0.02831)
Japan = 0,	-	-	-	-
North America	0.04986 (0.05471)	0.03980 (0.02968)	0.06543** (0.03071)	0.06482** (0.02995)
South America	0.05559 (0.07256)	0.06075* (0.03083)	0.07948** (0.03077)	0.07580** (0.03007)
Constant	-0.06628 (0.14270)	-0.08288 (0.09386)	-0.11617 (0.09141)	-0.10878 (0.08920)
Observations	60	60	60	60
R-squared	0.31124	0.34432	0.40685	0.44794
F-stat	4.318	2.339	2.744	2.934
Prob > F	0.000118	0.0209	0.00652	0.00343
Degree of Freedom	51	49	48	47

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 7: Robustness checks

Robustness check 1 is carried out in the same five-day event window (-2;+2) by using a different market benchmark to calculate CARs, i.e. national stock market index. Robustness check 2, instead, is calculated in a different event window, i.e. (0;+2).

VARIABLES	Rob Check 1 CAR[-2;+2]	Rob Check 2 CAR[0;+2]
ESG	-0.00355*** (0.00111)	-0.00142** (0.00070)
ESG ²	0.00003*** (0.00001)	0.00001** (0.00001)
partial	0.02164** (0.00966)	0.01079* (0.00614)
ID	0.01176** (0.00561)	0.00827** (0.00356)
beta	-0.01598*** (0.00619)	-0.01703*** (0.00394)
ln_asset	0.00471 (0.00386)	-0.00165 (0.00246)
experience	0.00019 (0.00037)	0.00011 (0.00023)
target_age	0.00052* (0.00030)	0.00007 (0.00019)
Africa, Middle East, or Central Asia	-0.02515 (0.03730)	-0.03336 (0.02373)
Asia Pacific Excluding Central Asia	-0.03879* (0.02038)	-0.03325** (0.01296)
Europe	-0.01210 (0.01877)	-0.02890** (0.01194)
Japan	-0.07480** (0.03163)	-0.01170 (0.02012)
North America	-0.01001 (0.01851)	-0.02278* (0.01177)
South America = o,	-	-
Constant	-0.05079 (0.13405)	0.09462 (0.08519)
Heckman - fintech M&A		
Intangibles/TotAsset	0.00000*** (0.00000)	0.00000*** (0.00000)
experience	-0.00036 (0.00347)	-0.00036 (0.00347)
Constant	-2.29776*** (0.06238)	-2.29776*** (0.06238)
Observations	4,445	4,445
Selected	60	60
Rho	0.303	0.00573
Sigma	0.0272	0.0166
Lambda	0.00825	9.51e-05
SE(Lambda)	0.0236	0.0150
Wald Chi2	48.78	52.51
Prob > Chi2	4.83e-06	1.10e-06

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 8: VIF test

Variable	VIF	1/VIF
ESG	2.91	0.34
partial	1.77	0.56
ID	1.29	0.78
beta	1.44	0.69
ln_asset	2.78	0.36
experience	1.49	0.67
target_age	1.8	0.56
Africa, Middle East, or Central Asia	1.86	0.54
Asia Pacific Excluding Central Asia	4.44	0.23
Europe	6.19	0.16
Japan	3.66	0.27
North America	6.69	0.15
Mean VIF	3.03	