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BANK MERGERS & ACQUISITIONS (M&As) IN THE U.S.: PERFORMANCE EVALUATION, SHAREHOLDER VALUE, AND THE EFFECT OF ECONOMIC POLICY UNCERTAINTY ON M&A OUTCOMES

BY
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The approval of this dissertation by the Department of Accounting and Finance of the University of Macedonia does not necessarily denote the acceptance of the author's opinions on behalf of the department.

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ABSTRACT

This thesis evaluates the financial performance of Mergers and Acquisitions (M&As) in the U.S. banking sector as well as several other M&A outcomes by using a dataset that contains 3,107 announcements of bank M&As over the 1986-2020 period. In particular, this thesis aims to investigate which factors and how they affect the performance, the bid premiums, the method of payment and the time of deal completion, considering the role of Economic Policy Uncertainty.

With respect to the short-run performance, the acquirers' wealth effects are assessed applying the event-study methodology using alternative asset pricing models for the estimation of Cumulative Abnormal Returns (CARs) over various event windows surrounding the deal announcements. The long-run performance is measured using the Buy-and-Hold Abnormal Returns (BHARs) for different holding periods after the deal completion. To investigate the effect of economic policy uncertainty, deal-related factors and bank-related factors on the performance of bank M&As both univariate and multivariate analyses are performed.

The results suggest that acquiring-banks' shareholders lose by about -0.32% in the three-day window surrounding the announcement of bank M&As, whilst M&As are also associated with negative returns in long-run. CARs in three-day window surrounding the M&A announcements are significantly (at the 1% level) lower by -1.37% for the acquisition of listed targets and by -0.68% for the selection of stock-only financed deals. Bank M&As during periods of high policy uncertainty are associated with significantly higher acquirers' gains by about 0.46% compared to those during periods of low uncertainty.

Results derived from multivariate analysis confirm that economic policy uncertainty, measured by the BBD index, has a positive impact on shareholder wealth which implies that bank M&As amid periods of high uncertainty are beneficial for acquiring-banks. A one standard deviation increase in policy uncertainty increases by 24.6bps the acquirers' CARs. Moreover, policy uncertainty has a positive impact on the takeover premiums and on the time of deal completion, whereas it has a negative impact on the selection of stock-only financed deals. The main results remain robust using alternative methodological approaches and asset pricing models and hold after addressing endogeneity concerns. Overall the results suggest that Economic Policy Uncertainty constitutes an important factor that affects the performance as well as other crucial outcomes of M&As in the banking sector. Bankers, investors, policy makers, and regulators should acknowledge that amid periods of high policy uncertainty there are opportunities for higher acquirers' returns through M&As in the banking sector.

Keywords: banks, mergers, acquisitions, financial performance, event-study, asset pricing models, economic policy uncertainty

ΠΕΡΙΛΗΨΗ

Η συγκεκριμένη διδακτορική διατριβή αξιολογεί τη χρηματοοικονομική απόδοση των Συγχωνεύσεων και Εξαγορών (Σ&Ε) στον τραπεζικό κλάδο των Η.Π.Α., καθώς και άλλα αποτελέσματα των Σ&Ε, χρησιμοποιώντας ένα δείγμα που περιλαμβάνει 3.107 ανακοινώσεις τραπεζικών Σ&Ε κατά την περίοδο 1986-2020. Ειδικότερα, η παρούσα διατριβή στοχεύει στη διερεύνηση των παραγόντων που επηρεάζουν την απόδοση, το προσφερόμενο premium, τη μέθοδο πληρωμής και το χρόνο που απαιτείται έως την ολοκλήρωση της συμφωνίας, λαμβάνοντας υπόψη το ρόλο της οικονομικής πολιτικής αβεβαιότητας.

Ως προς τη βραχυπρόθεσμη αποδοτικότητα, οι επιπτώσεις στον πλούτο των εξαγοραζουσών τραπεζών αξιολογούνται με τη μεθοδολογία μελέτης γεγονότος χρησιμοποιώντας εναλλακτικά υποδείγματα αποτίμησης περιουσιακών στοιχείων για την εκτίμηση των σωρευτικών μη-κανονικών αποδόσεων (CARs) σε διάφορα χρονικά παράθυρα κατά την ανακοίνωση των συμφωνιών. Η μακροπρόθεσμη απόδοση εκτιμήθηκε χρησιμοποιώντας τη μέθοδο BHAR σε διαφορετικές περιόδους διακράτησης μετά την ολοκλήρωση των συμφωνιών. Για τη διερεύνηση της επίδρασης που έχουν η οικονομική πολιτική αβεβαιότητα, τα χαρακτηριστικά των συμφωνιών και τα χαρακτηριστικά των τραπεζών-αγοραστών στην απόδοση των Σ&Ε εφαρμόζονται μονομεταβλητές και πολυμεταβλητές αναλύσεις.

Τα αποτελέσματα καταδεικνύουν ότι οι μέτοχοι των τραπεζών-αγοραστών χάνουν περίπου -0,32% στο παράθυρο τριών ημερών κατά την ανακοίνωση των Σ&Ε, ενώ οι Σ&Ε παρουσιάζουν, επίσης, αρνητικές μακροπρόθεσμες αποδόσεις. Οι σωρευτικές μη-κανονικές αποδόσεις στο παράθυρο τριών ημερών κατά την ανακοίνωση των Σ&Ε είναι στατιστικά σημαντικά (σε επίπεδο 1%) χαμηλότερες κατά -1,37% κατά την απόκτηση εταιριών-στόχων που είναι εισηγμένες και κατά -0,68% για την επιλογή Σ&Ε που χρηματοδοτούνται μόνο με μετοχές. Οι Σ&Ε σε περιόδους υψηλής οικονομικής πολιτικής αβεβαιότητας δημιουργούν στατιστικά σημαντικά υψηλότερες μη-κανονικές αποδόσεις για τις εξαγοράζουσες τράπεζες κατά 0,46% συγκριτικά με τις αποδόσεις των Σ&Ε σε περιόδους χαμηλής οικονομικής πολιτικής αβεβαιότητας.

Τα αποτελέσματα πολυμεταβλητής ανάλυσης καταδεικνύουν ότι η αβεβαιότητα οικονομικής πολιτικής, μετρούμενη με το δείκτη BBD, έχει θετική επίδραση στον πλούτο των μετόχων, αποτέλεσμα που υποδηλώνει ότι οι Σ&Ε σε περιόδους υψηλής οικονομικής αβεβαιότητας δημιουργούν υψηλότερες αποδόσεις για τις εξαγοράζουσες τράπεζες. Μία αύξηση κατά μία τυπική απόκλιση στο βαθμό οικονομικής πολιτικής αβεβαιότητας αυξάνει κατά 24,6 μονάδες βάσης τις σωρευτικές μη κανονικές αποδόσεις των τραπεζών-αγοραστών. Επιπροσθέτως, η οικονομική πολιτική αβεβαιότητα έχει θετική επίδραση στα προσφερόμενα premiums και στον χρόνο που απαιτείται έως την ολοκλήρωση της συμφωνίας, ενώ έχει αρνητική επίδραση στη χρηματοδότηση μόνο με μετοχές των Σ&Ε. Τα κύρια αποτελέσματα παραμένουν ισχυρά χρησιμοποιώντας διαφορετικές μεθοδολογικές

προσεγγίσεις, εναλλακτικά υποδείγματα ανάλυσης και αποτίμησης περιουσιακών στοιχείων, ενώ διατηρούνται ακόμη και μετά την αντιμετώπιση ζητημάτων ενδογένειας. Συνολικά, τα αποτελέσματα της διατριβής υποδηλώνουν ότι η αβεβαιότητα οικονομικής πολιτικής αποτελεί σημαντικό παράγοντα που επηρεάζει την απόδοση καθώς και άλλα βασικά αποτελέσματα των Σ&Ε στον τραπεζικό κλάδο. Οι τραπεζίτες, οι επενδυτές, οι υπεύθυνοι χάραξης πολιτικής και οι ρυθμιστικές αρχές πρέπει να αναγνωρίζουν ότι εν μέσω πολιτικής αβεβαιότητας υπάρχουν ευκαιρίες για υψηλότερες αποδόσεις στις εξαγοράζουσες εταιρίες μέσω τραπεζικών Σ&Ε.

Λέξεις-κλειδιά: τράπεζες, συγχωνεύσεις, εξαγορές, χρηματοοικονομική απόδοση, μελέτη γεγονότος, υποδείγματα αποτίμησης περιουσιακών στοιχείων, οικονομική πολιτική αβεβαιότητα

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Chapter 1: Introduction

This chapter highlights the motivation, the research objectives, the contribution as well as the outline of this thesis. Bank M&As constitute a strategic decision for financial firms through which economic gains can be achieved. The evaluation of market reaction to M&A announcements provides significant signs with respect to both the shareholder wealth and the investors' perceptions. Policy-related economic uncertainty constitutes a factor that is significantly associated with investment and managerial decisions. In this context, this thesis sheds light on the valuation effects of bank M&As amid periods of policy uncertainty.

1.1. Motivation

Corporate event announcements convey information to the market participants and are associated with wealth effects. Prior studies investigated the impact of events such as dividend announcements a, seasoned equity offerings and initial public offerings (Kolari et al., 2021; Li et al., 2016), share repurchases (Alderson et al., 2020; Autore and Jiang, 2019), stock splits/reverse splits (Kalotychou et al., 2009; Kolari et al., 2021), loan announcements (Zhang and Gregoriou, 2019), and mergers and acquisitions (Adra and Barbopoulos, 2018; Faccio et al., 2006; Fuller et al., 2002; Moeller et al., 2005, 2004) on the shareholder value.

Even though the evaluation of the wealth effects upon Mergers and Acquisitions (M&As) constitute one of the most examined field in finance (Antoniou et al., 2007; Doukas and Petmezas, 2007; Fuller et al., 2002), M&As announcements continue to concentrate the research interest (Morillon, 2021). More specifically, the total worldwide deal value hit new high and reached the $5.8 trillion in 2021 (which was by 64% higher than the total deal value in 2020), whereas the previous corresponding record was $4.55 trillion in 2007. Considering the geographic allocation of M&As, nearly the half of the worldwide deal value in 2021 (i.e. $2.5 trillion) is referred to deals in the United States (Reuters, 2021[1]). With respect to financial services M&As, according to the PWC report[2], M&As in this sector had a total deal value of $660 billion in 2021, whereas the corresponding value for America deals was $334 billion (PWC, 2022). The above numbers explain the increased research interest in topics which are related to M&As and particularly to bank M&As.

Literature supports that banks are special due to their role in insuring the deposits, in providing finance both to firms and to households, and generally in achieving economic growth (Allen et al., 2014; Berger et al., 2020b; Zingales, 2015). The U.S. commercial banking system has a unique role worldwide that has been acknowledged

[1] The article is available at: https://www.reuters.com/markets/us/global-ma-volumes-hit-record-high-2021-breach-5-trillion-first-time-2021-12-31/ (Assessed on 01/05/2022).

[2] Global M&A Trends in Financial Services: 2022 Outlook. Report is available at: https://www.pwc.com/gx/en/services/deals/trends/financial-services.html (Assessed on 10/06/2022).

by several studies and therefore it constitutes an ideal laboratory for research in banking (Berger et al., 2020b; Liu and Ngo, 2014; Noulas et al., 1993) and particularly in the field of bank M&As (DeLong, 2001; Filson and Olfati, 2014; Zollo and Singh, 2004).

With respect to the banking concentration in the U.S., Cetorelli et al. (2014) stated that whereas the top ten bank holding companies (BHCs) had about the 20% of the total bank assets in the 1980s, they accounted for about more than 50% of the total bank assets in 2004 which leaded to more complex financial institutions. In particular, since the 1980s, the shocks in the U.S. banking sector had resulted in bank failures and had induced the M&A activity (Koetter et al., 2007; Miller and Noulas, 1996; Wheelock and Wilson, 2004). Changes in both the regulatory framework (i.e. deregulation policies) and the legislative framework led to higher competition among U.S. commercial banks (Berger and Mester, 2003; Cetorelli and Strahan, 2006; Jiang et al., 2016; Kaparakis et al., 1994; Stiroh and Strahan, 2003) and are related to M&As in the banking sector (Becher and Campbell II, 2005; Garmaise and Moskowitz, 2006). Even though M&A activity was induced by deregulation policies, there are still remaining restrictions which prohibit M&A activity for BHCs in the U.S. (Berger et al., 2020b; Goetz et al., 2016).

Apart from the aforementioned, M&As in the banking sector constitute a strategic decision for banks which affect the default risk (Yildirim, 2020), the bank competition (Pérez Montes, 2014), the bank consolidation (Weiß et al., 2014; Wheelock and Wilson, 2004), the banking productivity and efficiency (Al-Khasawneh et al., 2020; Du and Sim, 2016; Halkos and Tzeremes, 2012; Yildirim, 2020), the liquidity creation (Baltas et al., 2017), the bank profitability (Knapp et al., 2006), the complexity of banking institutions (Carmassi and Herring, 2016), as well as other crucial aspects in banking.

A leading topic in the M&A-related field is whether and how M&As create economic value (Cuypers et al., 2017; Meng and Sutton, 2022). Considering the banking sector, even though there is inconclusive evidence about the sign and the magnitude of the wealth effects upon bank M&As, a vast majority of previous studies suggest that bank M&A announcements affect the shareholder value (Becher, 2000, 2009; Chong et al., 2006; DeLong, 2001, 2003; Scholtens and Wit, 2004). With respect to the U.S. banking sector, there is evidence that bank M&As at best provide zero returns for acquirers upon the announcement of bank M&As. Prior studies focused on specific factors that affect the value creation upon bank M&As (Al-Khasawneh and Essaddam, 2012; Cybo-Ottone and Murgia, 2000). Specifically, the passage of interstate deregulation (Becher, 2009), the passage of Dodd-Frank-Act (Leledakis and Pyrgiotakis, 2019), the regulation and merger legislation (Carletti et al., 2021), the selection of financial advisors (Chuang, 2014), the corporate governance

characteristics (Tampakoudis et al., 2022a) are factors that, among others, have an impact on the wealth effects upon bank merger announcements.

In addition to the above, a new research agenda in finance focuses on the implications of policy-related economic uncertainty (Berger et al., 2022). Policy uncertainty constitutes a crucial factor that affects the investment decisions (Handley and Limão, 2015), the economic activities (Fernández-Villaverde et al., 2015) and the financial markets (Amengual and Xiu, 2018; Pástor and Veronesi, 2013, 2012). Moreover, policy uncertainty constitutes a factor that explains several M&A outcomes. Recent studies showed that policy uncertainty is associated with the wealth effects upon corporate merger announcements (Adra et al., 2020; Bonaime et al., 2018; Borthwick et al., 2020; Nguyen and Phan, 2017; Sha et al., 2020). However, the above studies focus only on corporate deals and provide inconclusive evidence for the relationship between policy uncertainty and shareholder value.

The banking sector is highly regulated and therefore policy uncertainty is likely to has more pronounced effects in banks which enhances the interest in this research field. Considering the effect of policy uncertainty in the banking sector, prior studies argued that economic policy uncertainty affected the operations of U.S. banks. Bordo et al. (2016) provided evidence that economic policy uncertainty slowed the loan growth suggesting that policy uncertainty can affect the economy through the channel of bank lending. Furthermore, since the onset of the great recession, the results showed that high economic policy uncertainty was associated with reduction in annualized bank loan growth by about 2.5% (on average) over the period 2007-2013. The above impact of policy uncertainty on loan growth was more pronounced for large banks, for lower capitalized banks, and for banks with lower liquidity. Berger et al. (2022) evaluated whether economic policy uncertainty affects the economy through the channel of bank liquidity hoarding and found that banks, in response to policy uncertainty, hoarded more liquid assets. This result was more pronounced for banks which had lower liquidity, more spillovers with bank peers, and higher exposure to policy uncertainty. Thus, economic policy uncertainty affects the U.S. banks which also raises questions on whether it also affects the M&As in the U.S. banking sector.

This thesis draws motivation from the above framework. More specifically, the necessity for further evaluation of the performance implications of M&As in the banking industry, the inconclusiveness of prior evidence about the nexus between economic policy uncertainty and corporate M&A outcomes, and the lack of evidence about the effect of policy uncertainty on M&As in the banking sector raise crucial research questions that can be addressed by this thesis.

1.2. Research objectives and contributions

Wealth effects from bank Mergers and Acquisitions (M&As) constitute an interesting and continuously examined field in the financial research due to their important consequences in the banking sector. Even though a majority of previous studies argued that announcements of bank M&As generally destroy acquirers' value in the U.S., there is also evidence that the value creation from bank M&As is affected by acquirers' size, deal size, targets' listed status whilst it also depends on both the selected asset pricing model and the different span of sample period.

This thesis aims to investigate the short-run and the long-run performance of M&As in the U.S. banking sector and to examine several other outcomes of M&As, considering the role of Economic Policy Uncertainty. In this context, the purpose of this thesis is fivefold and specifically first to investigate the market reaction and thus the short-run performance for acquirers upon bank M&A announcements, second to analyze the long-run performance implications of bank M&As, third to determine crucial deal-related and bank-related factors that are associated with the valuation effects of M&As, forth to evaluate the impact of various aspects of policy uncertainty on both the performance and other outcomes (i.e. bid premiums, mean of payment, time to completion) of bank M&As, and fifth to test whether the application of different asset pricing models, alternative event-windows, or different methodological frameworks affect both the performance evaluation of bank M&As and the nexus between policy uncertainty and bank M&As.

To fully clarify the value implications of bank M&As over time as well as the determinants of the acquirers' performance, this thesis utilizes an extended sample period (i.e. 1986-2020) which covers multiple changes in the economic environment, the applied bank business models, the technological innovation as well as the structure and the operation of U.S. banks. Therefore, the investigation of the wealth effects upon bank M&As provides important insights, inter alia, for investors, bankers, policy makers, and regulatory authorities. Also, the inconclusiveness evidence for the determinants of acquirers' value and the potential unexplored factors that may affect the performance of bank M&As creates the necessity for further research in this field.

Thus, this thesis contributes to the extant literature in several ways. First, there is a lack of evidence for positive acquirer's gains upon the announcements of M&As in the U.S. banking sector which in turn raises plausible questions on whether and under which circumstances M&As are beneficial for the banking performance (DeYoung et al., 2009; Hagendorff and Vallascas, 2011). By analyzing several sub-groups of M&As (i.e. acquisition of listed targets or acquisition of non-listed targets, acquisition with stock-only mean of payment or acquisitions of non stock-only mean of payment, etc), this thesis attempts to address the above questions. Moreover, a strand of prior

studies focus only on the short-run performance of bank M&As and fail to provide evidence for the performance implications in the long-run. Given that Delong and Deyoung (2007) argued that long-run outcomes may be inconsistent with the short-run outcomes, this thesis offers new evidence by fully examining the performance of bank M&As and sheds light on whether the short-run outcomes persist over different holding periods after the deal completion. To this end, several regression models are performed to estimate the determinants of both short-run and long-run performance of bank M&As.

Second, this thesis contributes to the growing strand of literature that examines the financial implications of economic policy uncertainty. In the context of M&As, prior studies examined the effect of policy uncertainty only on corporate M&A outcomes. The studies which are closely related to this thesis are those of Adra et al. (2020), Bonaime et al. (2018), Cao et al. (2019), Lee (2018), Nguyen and Phan (2017), Paudyal et al. (2021), Sha et al. (2020) and Shams et al. (2022). However, the extant studies provided inconclusive evidence on whether and how policy uncertainty affects the performance of M&As. Due to the lack of empirical evidence in the nexus between policy uncertainty and M&As, there is need for further research. Moreover, previous studies exclusively focus on M&As in non-financial sectors rather than on financial companies and therefore they fail to provide evidence for an important industry for the overall economy which explains a large proportion of the worldwide deal volume, namely for the banking sector. By contrast, this thesis mainly focus on financial firms which have either a unique and crucial role for the overall economy or special characteristics compared to the non-financial companies and therefore provides crucial insights for the effect of the policy uncertainty on the banking sector. Furthermore, prior studies mainly examined one indicator of policy uncertainty (e.g. overall uncertainty, monetary uncertainty, etc) and therefore they fail to answer whether different dimensions of policy-related uncertainty have different effects on the performance of bank M&As. Moreover, only few of the above studies explore the impact of policy uncertainty on various M&A outcomes (short-run performance, long-run performance, bid premiums, method of payment and time to completion). Motivating by the inconclusiveness of prior results and the lack of evidence for banks, this thesis fills the aforementioned gaps first by examining the role of economic policy uncertainty on M&As in the banking sector and second by using alternative indices of policy uncertainty. In particular, this thesis analyzes, among other proxies of policy uncertainty, whether and how monetary policy uncertainty, fiscal policy uncertainty, taxes policy uncertainty, government spending policy uncertainty, healthcare policy uncertainty, national security policy uncertainty, regulation policy uncertainty, and financial regulation policy uncertainty exert significant impact on bank M&As. Thus, this thesis evaluates the impact of various indices of policy uncertainty on both the performance and the other outcomes of bank M&As. To best of our knowledge, this is the first study which investigates whether and how

alternative dimensions of policy uncertainty affect M&A outcomes in the banking sector.

Third, prior studies evaluate the performance of bank M&As using a limited sample period. On the contrary, the data of this study pertain to an extend period of 35 years (1986-2020) during which multiple changes existed that among others referred to the macro-economic environment (economic growths, recessions, crashes, financial/banking crises, etc.), to the monetary policy (expansionary or contractionary policy), to the political environment (elections, political changes), to the regulatory framework (deregulation, consolidation, anti-trust, etc), and to the technological environment (computers, internet, information systems, artificial intelligence, blockchain, fintech, etc.). It is plausible that all the above conditions create variations in the levels of policy uncertainty and affect the banks' financial position and their investment strategies. In addition, the selected sample period permits a substantial investigation of M&As during a period under which there were several changes in the structure, the operation and the products of the U.S. banking system. Therefore, this thesis aims to make a substantive contribution on what is already known about the performance implications of bank M&As.

Forth, this study proposes a methodology framework both for the performance evaluation of M&As and for testing the robustness of the results. More specifically, this thesis utilizes alternative asset pricing models for the estimation of the short-run performance, applies the BHAR methodology for the estimation of the long-run performance, performs several univariate and multivariate analyses for the examination of the determinants of the performance upon bank M&As and proposes a battery of robustness checks (PSM, Entropy balancing, Instrumental Variable approaches) which address sample selection bias and endogeneity issues in order to ensure that the results are not sensitive to the selected model specifications.

Fifth, this thesis finds robust evidence for the nexus between policy uncertainty and bank M&As and therefore it provides important insights that can be used by bankers, investors, policy makers, and regulatory authorities. The main result is that economic policy uncertainty affects both the performance and other important outcomes of M&As in the banking sector. In this context, the various stakeholders need to know how to adjust their strategy in order to benefit from M&As amid periods of high policy uncertainty.

Overall, this thesis is the first to analyze the significant impact of Economic Policy Uncertainty on the performance of M&As in the U.S. banking sector and it contributes to an emerging body of work that examines the impact of policy uncertainty on banks. Thus, this thesis advances the extant strands of M&A literature and provides new insights about the determinants of the M&A performance in the banking sector, considering the role of various indices of policy uncertainty.

1.3. Thesis structure and outline

This thesis provides both a theoretical and an empirical framework for the analysis of M&As in the banking sector. In the literature review, several studies are used to analyze the extant literature with respect to the market reaction to corporate events, the performance evaluation of M&As and the role of the economic policy uncertainty. In the empirical section, the methodology framework and the corresponding results are presented.

The remainder of this thesis is organized as follows: Chapter 2 provides a critical literature review about the market reaction to corporate event announcements, the prior findings with respect to the performance implications of mergers and acquisitions and the role of economic policy uncertainty in the context of M&As. Chapter 3 develops the research methodology, describes the data, explicates the event-study methodology, determines the asset pricing models and proposes the model specifications for the investigation of the thesis' research objectives. Chapter 4 presents the results derived from the performance evaluation of bank M&As in the U.S.. In particular, Abnormal Returns (AR) and Cumulative Abnormal Returns (CARs) that are estimated using alternative asset pricing models, as well as Buy-and-Hold Abnormal Returns (BHARs) with their corresponding tests of significance are performed in order to evaluate the valuation effects of bank M&As both in short-run and in long-run. Chapter 5 includes the analysis of the acquirers' shareholder value with respect to the geographic focus, the industry orientation, the selected method of payment and the targets' listed status. In addition, this chapter presents the results derived from the multivariate analysis about the determinants of the performance of bank M&As. Chapter 6 empirically analyzes the effect of economic policy uncertainty both on the performance of bank M&As and on other outcomes of M&As (i.e. takeover premiums, selected method of payment, time to completion). This chapter evaluates the existence of significant differences in acquirers' value, using alternative asset pricing models, between M&As that are announced during periods of high uncertainty and those that are announced during periods of low uncertainty. In addition, this chapter presents the results derived from the cross-sectional analysis for the effect of policy uncertainty on various M&A outcomes. Chapter 7 tests the validity of the results by using alternative model specifications. In particular, the effect of policy uncertainty on acquirer's wealth is assessed using both alternative asset pricing models and long-run measurements for the performance of M&As. Moreover, this chapter presents the results derived from PSM analysis, Entropy Balancing Approach, and Instrumental Variable approaches. Finally, chapter 8 highlights the main results, presents the practical implications, acknowledges the limitations, and proposes the agenda for future research.

Chapter 2: Literature Review

This chapter reviews the literature of the market reaction to corporate events and in particular reports results from previous studies with respect to the market response to M&A announcements. The effect of both corporate mergers and bank mergers on shareholder wealth is also highlighted. In addition, this chapter sheds light on the role of corporate governance mechanisms as well as the role of policy uncertainty on the performance of M&As.

2.1. Market reaction to corporate events announcements

Empirical studies in finance investigate the market reaction to various types of event announcements. Among other tests, event-studies are conducted to evaluate the market reaction to a plethora of different corporate-related events. Specifically, event-studies are used in the empirical researches to capture the economic impact of mergers and acquisitions announcements, issues of new debt, issues of equity, initial public offerings, dividend announcements, earning announcements as well as other significant events. Market reaction to corporate events is also assessed in order to test the market efficiency though analyzing whether stock markets efficiently incorporate information from event announcements (Michaely et al., 2016). Empirical results with respect to the market-reaction to corporate events[3] are presented below.

Boehme and Danielsen (2007) analyzed the long-term returns for stock splits over the period 1949-2000. The dataset was consisted of 6,106 stock-splits in the U.S..The long-run returns were estimated using the methodology of calendar-time portfolios and with the four-factor regression model. BHARs and CARs after the stock split announcement were also estimated. According to the results, for the entire period (1949-2000) and over the one-year post announcement period, all equity weighted intercepts were statistically significant and positive whereas the value-weighted intercepts were less robust in sub-periods. Long-run returns for the 2-year and the 3-year period after the stock splits were insignificant which implied that stock-split anomaly was presented at most in the first post announcement year. For the entire period, BHARs (CARs) for one-year period after the announcement were statistically significant and positive and equal to 4.937% (4.971%), whereas they mainly turned to insignificant values for the 2-year and the 3-year period after the stock-split announcements. Moreover, the results indicated that firms did not experience positive long-term returns in post-split periods and that positive returns did not persist after the actual date of the stock split. The authors argued that stock splits were associated with an announcement effect that was present only in the short-run and was attributable to trading frictions rather than to behavioral biases (Boehme and Danielsen, 2007).

[3] The market reaction to Mergers and Acquisitions is analyzed in distinct sub-sections of this thesis.

Kothari et al. (2009) analyzed whether managers delay the announcement of bad news due to greater magnitude of bad news relative to the magnitude of good news. The sample was consisted of 7,044 dividend-change announcements in the U.S. and specifically contained 5,803 dividend increases and 1,241 dividend decreases over the period 1962-2004. Furthermore, the study analyzed the market reaction to voluntary management earnings forecasts using a sample of 4,016 management forecasts over the period 1995-2002 of which the 965 events were classified as good news management earnings forecasts. To investigate the market reaction upon dividend-change announcements the event-study methodology was used. Cumulative abnormal returns were estimated using the five-day event window surrounding the announcement using the market adjusted model with the CRSP value-weighted as benchmark for the market portfolio. The results showed that investors positively reacted to dividend increases and the CAR was statistically significant and equal to 1.5%. On the contrary, investors' reaction upon dividend decreases was much larger but negative and specifically the five-day CAR was statistically significant and equal to -2.7%. CARs for good news forecasts were statistically significant and equal to 4.7% whereas CARs for bad news forecasts were statistically significant and equal to -8.3%. Overall, the results showed that the magnitude of the five-day CAR to bad news was higher than the corresponding magnitude of good news. They also found evidence that management delayed the release of bad news until its diffusion was inevitable. In contrast, management leaked and quickly revealed to the market the good news. Finally, they argued that the asymmetric market reaction to news (good versus bad) depended both on managers' incentives and on opportunities to withhold the bad news (Kothari et al., 2009).

Al-Yahyaee et al. (2011) investigated the information content of cash dividend announcements. Using a sample of 501 dividend announcements in Oman (178 decreases, 72 no changes, 251 increases) over the period 1997-2005, they investigated the wealth effects of dividend announcements in the case of a special environment with no taxes on dividends & capital gains, high share ownership concentration, low corporate transparency and frequent changes in dividends. To assess the market reaction upon dividend announcements, the event-study methodology was applied. Abnormal returns were estimated using both the market model and the market adjusted model with the MSM index as market benchmark. They found that dividend increases caused increases in stock prices, whereas dividend decreases caused decreases in stock prices. Firms with unchanged dividends experienced insignificant abnormal returns (Al-Yahyaee et al., 2011).

Bessembinder and Zhang (2013) evaluated the long-run returns after corporate events using buy and hold abnormal returns (BHARs) over pair matched firms. The matched sample contained 3,972 mergers and acquisitions (M&As), 5,131 seasoned equity offerings (SEOs), 8,966 initial public offerings (IPOs) and 887 dividend initiations over the period 1980-2005. Using regression models, the results indicated that

variations in firm-specific factors across event and control firms explained the BHARs for M&As, SEOs, IPOs and dividend initiations events. The estimated model intercepts were insignificant and therefore long-run abnormal returns were not significantly different from zero over the 1980-2005 period (Bessembinder and Zhang, 2013).

Andres et al. (2013) investigated the price reactions to dividend announcements. The dataset contained 921 dividend announcements by 150 large companies in Germany (listed on the Frankfurt Stock Exchange) over the period 1996-2006. Specifically, the sample was consisted of 521 dividend increases, 312 announcements of maintained dividends and 88 announcements of dividend cuts. To assess the stock price reaction upon dividend announcement the event-study methodology was used. The cumulative abnormal returns in the three-day window (-1, 1) were estimated using the market model with the CDAX index as market benchmark. The statistical significance of the abnormal returns was assessed using the BMP test (Boehmer et al., 1991) and the Corrado rank test (Corrado, 1989). The results indicated that announcements of dividend increases were associated with significant positive abnormal returns that equal to 1.13% in the three-day window, whereas announcements of maintained dividends were associated with significant positive abnormal returns that equal to 0.65% in the three-day window. Announcement of dividend decreases were associated with significant negative abnormal returns on the day of the announcement (day 0) which equal to -0.86%. The results derived from the multivariate analysis indicated that, after controlling for changes in dividend yield, the dividend surprise was significant positively associated with the three-day cumulative abnormal return upon the dividend announcements. Therefore, the results provided evidence that share prices reacted to the dividend surprises but they did not react to the change in dividend per se. In case that dividend announcements and earning announcements were made in the same day, the dividend surprise had higher impact on the share prices relative to the impact of earnings surprise on share prices (Andres et al., 2013).

David and Ginglinger (2016) examined whether dividend cuts were not bad news using the case of optional stock dividends. Optional stock dividends provide the ability to shareholders to choose between cash dividends or an equivalent number of new shares. Using a sample of 2,712 cash and stock dividends paid by 287 French listed firms over the period 2003-2012, they evaluated the market reaction upon such the announcements. Cumulative abnormal returns were estimated using the market model with the CAC All Tradable index as market benchmark. The results showed that CARs upon dividend cuts (optional stock dividends) in the two-day (-1,0) event window were statistically significant and equal to -0.68% (0.59%). They argued that firms that were committed to paying dividends were more likely to select the optional stock dividends when difficulties of paying cash dividends arose. Furthermore, they suggested that as opposed to dividend cuts, optional stock dividends were good news for shareholders (David and Ginglinger, 2016).

Li et al. (2016) analyzed the announcements effects of Seasoned Equity Offerings (SEOs) in the U.S.. The data contained 3,710 SEO announcements by firms listed on the NYSE and NASDAQ over the period 1982-2012. Specifically, the analysis included 3,388 non-bank SEO and 375 bank SEO announcements. Wealth effects were assessed using the event study methodology. The market model with the S&P500 index as market benchmark was used to calculate the cumulative abnormal returns over the three-day window (-1,1). For the whole sample, mean three-day CARs equal to -0.98% for bank SEO announcements but equal to -1.59% for non-bank SEO announcements. CARs for bank SEOs were significantly higher (by about 0.61%) relative to the non-bank SEOs. Using cross sectional analysis, they found that bank SEO announcements were significantly positively associated with CARs and therefore bank SEOs created higher abnormal returns relative to non-bank SEOs. The above result was consistent with the hypothesis that bank regulations reduced the likelihood of signal of overpriced equity in the case of bank SEOs. Moreover, they argued that the differences in abnormal returns between bank SEO and non-bank SEO announcements decreased during the financial crisis (2007-2009) but they increased in post Dodd-Frank-Act period. Specifically, the crisis dummy was significantly negatively associated with CARs but Dodd-Frank Act dummy was significantly positively associated with CARs (Li et al., 2016).

Michaely et al. (2016) investigated whether investors in the U.S. pay less attention to Friday announcements. The sample contained 205,754 event announcements by U.S. companies and included dividend changes, seasoned equity offerings, share repurchases earnings and mergers. Abnormal returns upon event announcements were estimated using the two-day Buy-and hold abnormal returns in the window (0 ,1) for all the event types expect from repurchase announcements. Furthermore, four-factor model and market model were also used. The sample period covered the 1995-2010 for all events expect both for mergers (1994-2006) and for earnings (1995-2006). The results indicated that in the U.S. market there was a reduced market reaction to Friday announcements but this finding was derived due to selection bias. Companies that made announcements on Fridays were associated with reduced market response relative to market response for announcements that were made on any weekday. However, when correcting for selection bias, there was no evidence for investor inattention upon Friday event announcements (Michaely et al., 2016).

Liu et al. (2016) estimated the market reaction to seasoned offerings in China using a sample of 1,659 registered seasons issued for firms listed on the Shanghai Stock Exchange and the Shenzhen Stock Exchange over the period 1991-2010. To assess the market reaction the event-study methodology was used with the market model using the value-weighted Composite Index of the Shanghai Stock Exchange and the Shenzhen Stock Exchange as market benchmark. Cumulative abnormal returns were estimated over the two-day, the three-day, the five-day and the ten-day event windows surrounding the seasoned offerings and the five-day window (-2 , 2) was used as main

proxy. The results for the five-day event window (-2, 2) showed statistically significant and negative CARs for right issues (-1.64%) and open offers (-0.36%), but statistically significant and positive CARs for private placements (0.08%) and convertible bond issues (1.27%). Moreover, the results indicated that market reaction was related to issuer-specific and issue-specific factors by reference to the period immediately surrounding the seasoned offerings (Liu et al., 2016).

Khanal and Mishra (2017) analyzed the stock price reactions to the announcement of stock dividends over a period that was characterized by sluggish economic growth. Specifically, the sample contained 460 stock dividend announcements in the U.S. over the period 2006-2012. The event study methodology was used to capture the announcement effects. Cumulative abnormal returns were estimated over the three-day event window (-1,1) using the market model with both the equally weighted and the value weighted CRSP index. The results indicated that upon the day of the announcement (0 day) there were statistically significant average abnormal returns that equal to 0.39%, whereas the results of CARs over the three-day event window (-1,1) showed the existence of statistically significant and positive excess returns that equal to 1.06%. Overall, they found evidence of significant positive increase in stock prices surrounding the stock dividend announcements which was explained by the market's expectations for an increase in firms' future cash flows. This result was consistent with the market-signaling hypothesis. However, compared to the abnormal returns that captured on previous studies (5.87%), they found lower abnormal returns (1.81%) (Khanal and Mishra, 2017).

Autore and Jiang (2019) evaluated the existence of a preholiday effect upon corporate event announcements. The dataset contained 154,850 corporate announcements of several event types that included share repurchases (8,466), seasoned equity offerings (5,286), favorable earnings announcements (70,390), unfavorable earnings announcements (30,590), favorable dividend changes (7,972), unfavorable dividend changes (2,014), favorable acquisitions (28,299) and unfavorable acquisitions (1,833) for U.S. companies over the period 1984-2015. The market reaction to corporate events was assessed using the event study methodology and specifically the market model was used to calculate the two-day (0,1) CARs (for robustness the one-day and the three-day event windows were also used). They compared the market reaction to such the events with respect to periods prior to major holidays (included New Year's Day, Valentine's Day, Presidents' Day, St. Patrick's Day, Easter, Mother's Day, Memorial Day, Father's Day, Independence Day, Labor Day, Halloween, Thanksgiving and Christmas Day). Preholiday dummy equaled the value of one for a period t-2 to t (holiday was assumed on day t). They found the existence of higher positive market reaction upon favorable events and lower negative reaction upon unfavorable events that announced immediately before or during holidays as opposed to the market reaction for announcements upon ordinary days. Results from multivariate analysis showed that preholiday dummy had a statistically significant and

positive impact on cumulative abnormal returns upon the corporate event announcements. They also argued that the mood of market participants tended to rise in preholiday periods (Autore and Jiang, 2019).

Lobão et al. (2019) investigated the market reaction to bank rating announcements. The sample contained 399 rating changes for 50 European banks that were announced by Moody's and Fitch over the period 2004-2015. From the 399 announcements, the 325 referred to downgrade changes whereas the 74 referred to upgrade changes. The price effects upon rating announcements were evaluated using the event-study methodology. Cumulative abnormal returns over various event windows were estimated using the market model with each country domestic value-weighted bank index as market benchmark. The results for the two-day announcement window (0,1) showed statistically significant and negative CARs upon downgrade announcements that equal to -1.23% but statistically significant and positive CARs upon upgrade announcements that equal to 1.50%. The authors found, contrary to the previous studies, that bank downgrades were not associated with significant negative abnormal returns in pre-announcement windows relative to the rating changes announcements; however, for the upgrade announcements the results were consistent with the overreaction pattern because they were significant positive in the pre-announcement window but they were negative in the post-announcement windows. The large positive returns upon upgrade news in the pre-announcement window denoted the intensive interest of market participants to such the announcement. Furthermore, they argued that rating announcements provided new information that was incorporated into capital markets and therefore the rating agencies through the announcement of rating changes enhanced the levels of both transparency and efficiency in the capital markets (Lobão et al., 2019).

Alderson et al. (2020) evaluated the wealth effects of share repurchases on both stockholders and bondholders. The dataset contained 1,117 open market share repurchases announced by U.S. firms over the period 2003-2015. Cumulative abnormal bond returns and cumulative abnormal stock returns were estimated over various event windows. In the three-day event window (-1,1), for increases in firm value, cumulative abnormal stock returns (CASRs) equal to 2.30% whereas cumulative abnormal bond returns (CABRs) equal to 0.115%. Upon decreases in firm value, CASRs were equal to -1.30% whereas CABRs were equal to -0.104%. Furthermore, they argued that CASRs (CABRs) for increases in firm value were significantly higher by about 3.601% (0.219%), compared to decreases in firm value. Overall, they found that share repurchases announcements increased shareholder wealth but did not affect bondholder wealth (Alderson et al., 2020).

Zheng (2020) investigated the implications of corporate event announcements on trading behavior. The dataset contains 47,387 event announcements from U.S. companies listed on NYSE, NASDAQ and AMEX over the period 2001-2010. Five

types of corporate events were included in the study: the mandatory annual earnings announcements, the voluntary earnings guidance, the changes of dividend, the seasoned equity offerings and the share repurchases. Abnormal turnover was estimated to capture the abnormal trading volumes whereas cumulative abnormal returns were estimated to capture the price changes for the same period as the abnormal turnover period. Abnormal returns were calculated using the market-adjusted model using the decile portfolios of Fama and French (1992) as benchmark. The results indicated positive and significant cumulative mean abnormal turnover in the windows (0, 1) and (2,10) for the five event-types analyzed in the study. For the window (-10, -1) the results indicated that expected event announcements (actual earnings, earnings guidance) were associated with significant negative cumulative mean abnormal turnover, while unexpected event announcements (dividend changes, SEO, share repurchases) were associated with significant positive cumulative mean abnormal turnover. The results of the cumulative abnormal returns indicated significant market reaction for the five types of event announcements. In the two day (0,1) window, downside events were associated with significant negative abnormal returns, whereas upside events were associated with significant positive abnormal returns. Furthermore, SEO announcements were associated with significant negative abnormal returns (-1.59%) whereas share repurchases were associated with significant positive abnormal returns (1.64%). Overall, the study indicated that trading volume decreased before the expected announcements both for scheduled and for not scheduled announcements (Zheng, 2020).

Chapple et al. (2021) investigated whether Friday announcements were special in the continuous disclosure environment of Australia compared to the U.S. market. Specifically they tested the hypothesis that traders paid less attention to Friday corporate event announcements. The dataset contained event announcements for repurchases, SEOs, dividend changes, mergers and earnings for both the Australian and the U.S. market. The dataset covered the period 1994-2018 for mergers and the period 1995-2018 for the other event types. For the both markets, the total number of observations of the five event-types equal to 184,319. Abnormal returns were estimated using the buy-and-hold abnormal returns (BHAR) over the window (0,1) for the majority of the announcements, whereas BHAR over the window (-1,1) were calculated only for repurchases announcements. For the U.S. market, abnormal returns were estimated using the four-factor model. Furthermore, the market-adjusted model was also used. The results indicated that for the U.S. market the reduced market reaction to Friday event announcements, except for earnings announcements, disappeared after correcting for selection bias. Furthermore, the results failed to provide evidence that investors in the Australian market paid less attention to Friday corporate event announcements. Therefore a continuous disclosure environment (such as the environment of Australian stock market) improved the market efficiency (Chapple et al., 2021).

Kolari et al., (2021) analyzed the long-run abnormal returns upon major corporate events in the U.S. Specifically, they utilized a sample of 8,347 initial public offerings (IPOs), 7,327 seasoned equity offerings (SEOs), 5,592 mergers and acquisitions (M&As), 1,288 dividend initiations (DIV), 16,391 share repurchase events (REP), 4,599 stock split announcements, 4,602 stock splits and 1,668 reverse splits during the period 1980-2015. Long-run abnormal returns were estimated using three alternative methods and specifically (a) the abnormal standardized returns (ASRs), (b) the buy and hold abnormal returns (BHARs) and (c) the calendar time abnormal returns (CTARs). According to the results, M&As created significant positive abnormal returns in the month of the announcements both in the entire period and in sub-periods. However, in the post regulation period (2003-2015) M&As were associated with negative long-run abnormal return for periods that varied from 6 months to 5 years after the announcements, depending on the employed model. Significantly negative long-run abnormal returns for years after the announcements were also found for IPOs, SEOs and reverse stock splits, whereas significantly positive long-run abnormal returns were detected for DIVs, REPs, split announcements and split effective date events over the period 1985-2015. In general the results suggested that significant long-run abnormal returns persisted for months after corporate event announcements and the above result was also supported during the post-2003 period (Kolari et al., 2021).

Tampakoudis et al. (2022b) evaluated the stock market reaction to the announcements of syndicated bank loans before and during the COVID-19 pandemic. The dataset was consisted of 637 syndicated bank loans that were announced by European borrowers. To estimate the valuation effects upon the announcements, the event study methodology was used. The Cumulative Abnormal Returns were estimated using the market model while the Stoxx Europe 600 as well as the Euro Stoxx 50 indices were used as proxies for the market portfolio. For robustness, CARs were also calculated by the CAPM, the two-factor CAPM, the four-factor, and the five factor model. The results showed insignificant three-day (-1,+1) CARs before the pandemic, but the existence of statistically significant CARs that equal to 1.56% during the pandemic. In particular, borrowers' CARs during the pandemic were significantly higher by about 1.80% compared to those during the pre-pandemic period. The results derived from the multivariate analyses showed that several corporate governance characteristics affect the value creation from syndicated bank loan announcements and specifically that corporate governance characteristics had different impact on borrowers' returns between pre-pandemic and during-pandemic periods.

Table 1 presents the summarized results derived from the literature review with respect to the market reaction upon corporate event announcements.

Table 1. Empirical results for the market reaction to corporate event announcements

Year	Authors	Research Aim	Events	Sample Period	Country	Event Study Methodology	Results
2007	Boehme and Danielsen	Evaluation of the long-run performance of stock split announcements	6,106 stock-splits	1949-2000	U.S.A.	Calendar-time portfolios, BHARs and CARs	Firms did not experience positive long-term returns in post-split periods. Positive returns did not persist after the actual date of the stock split.
2009	Kothari et al.	Investigation of whether managers delay the announcement of bad news	7,044 dividend changes and 4,016 management forecasts	1962-2004 for dividend changes and 1995-2002 for management forecasts	U.S.A.	Market adjusted model with the CRSP value-weighted as benchmark for the market portfolio	Investors positively (negatively) reacted to dividend increases (decreases) and the CAR was statistically significant and equal to 1.5% (-2.7%). CARs for good (bad) news forecasts were statistically significant and equal to 4.7% (-8.3%). Management delayed the release of bad news but quickly revealed the good news.
2013	Andres et al.	Evaluation of the price reaction to dividend announcements	921 dividend announcements	1996-2006	Germany	Market model with the CDAX index as market benchmark	Dividend increase announcements were associated with significant three-day CARs that equal to +1.13%, whereas maintained dividend announcements were with significant three-day CARs that equal to 0.65%. Dividend surprise had higher impact on the share prices relative to the earnings surprise (when both were announced on the same day).
2013	Bessembinder and Zhang	Evaluation of long-run returns	3,972 M&As, 5,131 SEOs, 8,966 IPOs and 887 dividend initiations	1980-2005	U.S.A.	Buy and hold abnormal returns estimated using pair matched firms for benchmark	Variations in firm-specific characteristics across event and control firms explained the long-run abnormal returns. Long-run abnormal returns were insignificantly different from zero.
2016	Liu et al.	Evaluation of the market reaction to seasoned offerings	1,659 SEOs	1991-2010	China	Market model using the value-weighted Composite Index of the Shanghai Stock Exchange and the Shenzhen Stock Exchange as market benchmarks	The five-day event window (-2, +2) CAR was statistically significant and negative both for right issues (-1.64%) and for open offers (-0.36%), but it was statistically significant and positive both for private placements (0.08%) and for convertible bond issues (1.27%).
2016	Michaely et al.	Investigation of whether investors in the U.S. pay less attention to Friday announcements	205,754 corporate event announcements (dividend changes, seasoned equity offerings, share repurchases earnings and mergers)	1994-2010	U.S.A.	Abnormal returns are estimated using several models (BHAR, four-factor, market model)	There was a reduced market reaction to Friday announcements but this finding was derived due to selection bias.
2017	Khanal and Mishra	Evaluation of the stock prices reaction to stock dividend announcements	460 stock dividend announcements	2006-2012	U.S.A.	Market model with both the equally weighted and the value weighted CRSP index	Three-day (-1,+1) CARs were statistically significant (+1.06%). Stock prices significantly positively reacted to stock dividend announcements.
2019	Lobão et al.	Estimation of the impact of bank rating changes announcements on stock prices	399 rating changes	2004-2015	Europe	Market model with each country domestic value-weighted bank index as market benchmark	In the two-day announcement window (0,+1) the CARs were statistically significant and negative upon downgrade announcements (-1.23%), but they were significantly positive upon upgrade (+1.50%).
2020	Zheng	Investigation of the relationship between corporate event announcements and trading behavior	47,387 events (mandatory annual earnings announcements, voluntary earnings guidance, changes of dividend, seasoned equity offerings and share	2001 - 2010	U.S.A.	Abnormal trading and abnormal returns using the market adjusted model	In the two day (0,+1) window, downside events were associated with significant negative abnormal returns, whereas upside events are associated with significant positive abnormal returns. SEO announcements were associated with significant negative abnormal returns (-1.59%) whereas share repurchases were associated with significant positive abnormal returns (1.64%).

			repurchases)				
2021	Chapple et al.	Investigation of whether Friday event announcements are special	184,319 events (repurchases, SEOs, dividend changes, mergers and earnings)	1994-2018	U.S.A. & Australia	Abnormal returns are estimated using several models (BHAR, four-factor, market model, market adjusted model)	In the U.S. market, the reduced market reaction to Friday event announcements (except for earnings announcements) disappeared after correcting for selection bias. In the Australian market, there was no evidence that investors paid less attention to Friday corporate event announcements.
2021	Kolari et al.	Evaluation of the significance of long-run abnormal returns	8,347 IPOs, 7,327 SEOs, 5,592 M&As, 1,288 DIVs, 16,391 REPs, 4,599 stock-split announcements, 4,602 stock splits and 1,668 reverse stock-splits	1980-2015	U.S.A.	Abnormal standardized returns (ASR), buy and hold abnormal returns (BHAR) and calendar time abnormal returns (CTARs)	Significant long-run abnormal returns persisted for months after major corporate events.
2022	Tampakoudis et al.	Examination of the borrowers' returns and the role of corporate governance upon syndicated bank loans	637 syndicated loans	2018-2020	Europe	CARs with the market model using the Stoxx Europe 600 and the Euro Stoxx 50 indices. For robustness, CAPM, two-factor CAPM, four-factor model, and the five factor model	Insignificant three-day (-1,+1) borrower CARs before the pandemic, but the significantly positive CARs (+ 1.56%) during the pandemic. Significantly higher borrower CARs during the pandemic (by about 1.80%). Different impact of CG characteristics on borrower returns between pre-pandemic and during-pandemic periods.

2.2. Corporate Mergers & Acquisitions (M&As)

Mergers and Acquisitions (M&As) constitute a strategic decision for corporations through which the firm efficiency, the long-run performance as well as the shareholder value are affected. M&As continue to receive the research interest because they still remain a popular and an important form of corporate development. Notwithstanding that M&As are popular, they appeared to at best associated with mixed performance outcomes for the stakeholders (Cartwright and Schoenberg, 2006).

Golubov et al. (2012) argue that M&A activity constitutes one of the most important aspects in the corporate finance. Companies engage in merger activity in order to take advantages that come from financial synergies, managerial synergies and operational synergies (Jain et al., 2019). Given that the above benefits are likely to positively affect the firms' market value, several empirical studies pay attention on the valuations effects of merger and acquisition announcements. Luo (2005) argued that market reaction to M&A announcements provides important information for insiders who used this information later in order to close the deals.

Merger announcements are associated with two main problems for the regulatory authorities. First, announcement of a merger provides information that significantly affects the asset prices. Second, the planning of a merger requires the participation of several people who posse inside information and therefore there is a possibility of information leakage prior to the first public announcement (Keown and Pinkerton, 1981). The merger activity clusters in time resulting in merger waves (Hagendorff, 2011). A merger wave reflects a specific pattern with respect to the number of deals and the deal value over time. In essence, a merger wave constitutes a period which is characterized by high merger volume. Until now, six merger waves have been analyzed in the academic literature: the waves of 1900s, 1920s, 1960s, 1980s, 1990s and that of 2000s.

The wave of 1960s was known as "conglomerate" and was characterized by takeovers between firms which belong to different industry sectors. Takeovers during the 1960s wave were mainly paid with stock. The wave of 1980s was characterized by takeovers by financiers which mainly used cash as payment method. The wave of 1990s was referred to takeovers that had similar characteristics with the takeovers of 1960s namely the usage of stock as method of payment and the announcement during periods of high market valuations (Shleifer and Vishny, 2003).

Martynova and Renneboog (2008) in their study summarized and classified the basic characteristics of the first five takeover waves. The first wave of 1900s (1890s-1903) emerged from the economic expansion, the industrialization, the development of trading on NYSE and the technological changes. The end of this wave was around

1903-1905 a period during which the equity market crash occurred. This wave was observed in the U.S.A., was associated with the formation of monopolies (industry focused deals), and was characterized by the selection of cash as the mean of payment. The second takeover wave of 1920s (1910s-1929) was also observed in the U.S.A. but referred to the formation of oligopolies through industry focused deals. The beginning of this wave coincided with the economic recovery both from the First World War and the market crash. This wave was characterized by the selection of equity as a mean of deal payment. The second wave ended after the stock market crash and due to the beginning of the 1929 Great Depression.

The third takeover wave of 1960s (1950s-1973) was captured to the regions of U.S./U.K./Europe and characterized by processes of industry diversification. Over this takeover wave, the equity was used as the main payment method. The beginning of the third merger wave coincided with the recovery period (after the Second World War) and a period during which the tightening of the anti-trust regime (1950) took place. It lasted until the 1973 oil crisis and the consequent economic slowdown. The fourth takeover wave of 1980s (1981-1989) took place in the regions of U.S., U.K., Europe and Asia. During this wave, M&As were motivated to reduce the industry inefficiencies and therefore they were mainly characterized as industry focused-deals. The beginning of this wave coincided with the economic recovery after the recession, the deregulation of the financial sector, the growth of the financial markets as well as the changes in the anti-trust policy. M&As during the fourth wave were paid by both stock and cash. This wave lasted until the 1987 stock market crash (Martynova and Renneboog, 2008).

The fifth takeover wave of 1990s (1993-2001) was characterized by geographical dispersion with a geographical scope in U.S., U.K., Europe and Asia. The activity in Europe was similar to the activity in U.S. and U.K. M&As were mainly motivated by the need to address the globalization effects and were referred to industry-focused deals. During this wave, M&As were paid mainly using equity. The market boom, the deregulation, the privatization and the technological changes induced the starting of the fifth wave, whereas the 2000 market collapse (as well as the 9/11 attract) coincided with the end of this wave (Martynova and Renneboog, 2008).

The sixth merger wave of 2000s (2003-2007) begun about three years after the end of the fifth takeover wave just after the burst of technology bubble. It lasted until the late 2007 (before the onset of global financial crisis). The peak of this wave recorded in 2006 when the deal value within the U.S.A. exceeded $1 trillion. The end of this wave coincided with the increased investors' concerns towards the mortgage-backed securities (MBS) and the credit markets as well as their consequences in the financial system. During the sixth merger wave, the market for corporate control was characterized by lower competition. Another characteristic of the sixth merger wave

was that bid premiums were significantly lower compared to the premiums paid in the past (Alexandridis et al., 2012).

Merger activity can be affected by the market valuation. In particular, market overvaluation is associated with increase in the likelihood of merger activity, whereas market undervaluation can halt the merger waves (Rhodes-Kropf and Viswanathan, 2004). With respect to the merger waves, Duchin and Schmidt (2013) showed that acquisitions initiated during merger waves are associated with poorer quality of analysis, higher levels of uncertainty and weaker CEO turnover-performance sensitivity. Furthermore, in-wave acquisitions are associated with significantly lower long-run performance as well as with weaker acquirers' corporate governance mechanisms compared to out-wave acquisitions (Duchin and Schmidt, 2013).

2.3. Empirical Results for the wealth effects upon corporate M&As

The success of M&A activity depends on the achievement of synergy gains which in turn is associated with the prudent selection of target firms as well as with the efficiency of the integration process after the acquisitions (Barkema and Schijven, 2008). In this context, Seth (1990b) argued that the value creation upon acquisitions can be explained by the market power, the economies of scale, the economies of scope, the coinsurance, and the risk diversification. Abnormal returns derived from an event-study analysis have been widely used in the context of M&As to assess the performance implications across a specific event window (Cuypers et al., 2017). Barkema and Schijven (2008) argued that, notwithstanding the increasing amount of criticism for the short-run performance upon M&As, the short-term abnormal returns constitute by far the most widely used measurement of performance in the literature on M&As. Prior studies showed that merger announcements are generally associated with significant value creation for target firms, which can be explained by the premiums paid to targets. Value creation is also presented for the combined entity. However, bidders are associated with negative or insignificant valuation effects (Doukas and Petmezas, 2007). Empirical results for the market reaction to corporate M&A announcements are presented bellow.

Fuller et al. (2002) evaluated the returns of bidding firms in the U.S.A. using a sample of 3,135 merger announcements by 539 unique bidders over the period 1990-2000. The standard event study methodology was used to estimate the cumulative abnormal returns for the five-day (-2, 2) period surrounding the merger announcements. The cumulative abnormal returns were estimated with the market adjustment model using the value-weighted market index as benchmark. For the whole sample, there was a significant average (median) cumulative abnormal return of 1.77% (1.07%), whereas the significant positive abnormal returns were present regardless of the selected

method of payment. Furthermore, with respect to the target public status, the results indicated that mergers of private targets were associated with significant positive CARs (2.08%), whereas the acquisition of public targets was associated with significant negative CARs (-1.00%) upon the merger announcement. With respect to the target public status, the higher abnormal return was driven by the acquisition of subsidiary targets with a combination of stock and cash as mean of payment (3.33%), whereas the lower abnormal return was driven by the acquisition of public target with stock as medium of payment (-1.86%). With respect to the relative target size measured by the target value to the acquirer value, the results indicated that the acquisition of targets with a relative size above the 20% was associated with higher acquirer gains, compared to the acquisition of targets with lower relative size. Specifically, the acquisition of targets with relative size higher than 20% was associated with significant positive five-day cumulative abnormal returns with a mean (median) of 3.23% (2.14%).

Goergen and Renneboog (2004) investigated the wealth effects of European domestic and cross-border deals. Using a sample of 228 M&As involving European bidders and targets over the period 1993-2000, they estimated the announcement wealth effects and their drivers. The wealth effects were estimated using the CAPM with several alternative ways for the estimation of the beta. The results indicated that announcement abnormal returns for the two day event window (-1, 0) are significantly positive and equaled 0.7% for the bidders, while equaled 9% for the targets. According to the results, announcement target wealth effects for hostile takeovers were significantly higher than those for friendly acquisitions. On the contrary, acquirer announcement wealth effects are significantly positive (negative) for friendly (hostile) acquisition. Furthermore, they found differences in abnormal returns between deals that involve UK firms and those that involve both bidders and targets from the Continental Europe. Specifically, the former experienced higher cumulative abnormal returns upon deal announcements.

Mitchell et al. (2004) investigated the price pressure around mergers. Using a sample of 2,130 mergers and acquisition in the U.S.A. over the period 1994-2000 they estimated the cumulative average abnormal returns upon announcement date, upon closing date, over the pricing period as well as over the entire event window. Abnormal returns were estimated by the market model using the CRSP value-weighted index as market benchmark. The results supported the existence of price pressure around mergers which was driven by uniformed shifts in excess demand. However, the price pressure was short-lived giving support to the argument of non-perfectly elastic demand curves for stocks. Specifically, they found positive CAAR on the (-1,1) window that equal to 0.96% for cash deals but significantly negative CAAR for fixed-exchange-ratio mergers (-2.73%) and for collar deals (-0.88%) upon the deal announcements. During the pricing period, the CAAR was significantly negative (-3.18%) for floating-exchange-ratio stock mergers.

Moeller et al. (2004) examined 12,023 U.S. acquisitions over the period 1980-2001. The wealth effects of merger announcements were assessed using the market model for the calculation of cumulative abnormal returns. Furthermore, the impact of merger announcements on shareholder value was examined using the average dollar abnormal returns upon the announcements. The results indicated that the equally weighted abnormal return upon acquisition announcement was 1.1%; however, acquirers' shareholders lost on average about $25.2 million upon the announcements. They also stated that the dollar abnormal returns could be different from the percentage returns in terms of sign when the sign of the percentage abnormal returns was different between large and small firms. In this context, the results further supported the existence of a size effect on abnormal returns upon acquisition announcements. Specifically, small acquirers gained about 2% higher abnormal returns upon announcement compared to the large acquirers. However, with respect to the target public status, small acquirers destroyed value only in the case of acquisitions of public targets with equity as mean of payment. The size effect persisted irrespective of both the financing form and the targets' public status and was robust to firm-specific and deal-specific factors. Large firms paid higher acquisition premiums compared to the premiums paid by small firms and they involved in acquisitions with significantly negative dollar synergy gains.

Antoniou et al. (2007) evaluated the acquirer wealth effects for firms that engage in many acquisitions. The dataset contained 1,401 deals announced by 319 unique U.K. acquirers over the period 1987-2004. The wealth effects were estimated using the event-study methodology. Cumulative abnormal returns were calculated for the five-day (-2, 2) event window using the market adjusted model with the value-weighted market index as benchmark. Furthermore, Calendar Time Abnormal Returns (CTARs) using the 25 size and book-to-market equity (B/M) portfolios for 1, 2 and 3 years. The results indicated that, for the whole sample, the five-day (-2, 2) CAR was significantly positive and equal to 1.26%. Both cash and non-cash acquisitions were associated with significant positive abnormal returns. The acquisition of private or subsidiary target was associated with significant positive abnormal returns, whereas the acquisition of public target was associated with insignificant abnormal returns. With respect to the multiple bids, the results indicated that acquirers earned significant positive abnormal returns for their first bids (1.66%). However, cumulative abnormal returns for the fifth and/or higher order bids were insignificant. Long-run analysis showed that, for the whole sample, the Calendar Time Abnormal Returns were significantly negative for both the 2-year period and the 3-year period after the acquisition. Given the differences between the positive short-run effects and the negative long-run effects, they could not conclude whether acquisition of private and/or subsidiary targets is associated with real economic gains or the significant and positive short-run CAR is merely an illusion of stock market inefficiency.

Doukas and Petmezas, (2007) investigated the effect of overconfident managers on bidder abnormal returns. The dataset was consisted of 5334 mergers announced by UK public firms, excluding financial and utility acquirers and targets, over the period 1980-2004. Using the event-study methodology, the cumulative abnormal returns for the five-day window (-2, 2) were estimated. The market-adjusted model was applied with the value-weighted index as market benchmark. Furthermore, the method of calendar time portfolio regressions was used to assess the long-term performance of mergers. The results indicated significant and positive abnormal returns in the five-day window (-2, 2) that equal to 1.00% for the whole sample. Acquirers of private firms earned significant positive abnormal returns (1.18%) whereas acquirers of public firms were associated with significant negative abnormal returns (-0.90%). Moreover, deals with public targets which paid with stock were associated with significant negative abnormal returns (-2.23%) whereas acquisitions of private targets which were paid by stock were associated with significant positive abnormal returns (3.47%). They also found that the wealth effects of acquirers with overconfident managers were considerable lower relative to the wealth effects for acquirers with "rational" managers. High-order acquisitions (five or more than five deals within a period of three-years) were associated with significantly lower valuation effects compared to the valuation effects of low-order acquisitions.

Petmezas (2009) examined the relationship between market valuations and acquirer's performance. The sample consisted of 2,973 U.K. acquisitions over the period 1984-2003. Short-run performance was measured using the event study methodology. Specifically, cumulative abnormal returns were estimated with market adjusted model with the value-weighted market index for the market portfolio. Long-run returns were estimated using the Calendar Time Portfolio Regressions (CTPRs) with the Fama-French three factor model. For the whole sample, the five-day (-2,2) CARs were statistically significant and equal to 1.17%. CARs were significantly positive for high-valuation acquirers (1.66%) but insignificant from zero for low-valuation acquirers, which implied that acquirers rewarded from merger activity only in high-valuation periods. Moreover, the results showed that mergers during bullish periods experienced significantly higher short-run performance. The cross-sectional analysis confirmed that high valuation deals significantly positively affect the acquirer CARs. However, in the long-run the effect of market valuation on bidder performance was reversed because market participants acknowledged that the merger activity was pressured by the "urge to merge". Specifically, the results showed that the positive market reaction upon merger announcements was fully reversed over the next 1-3 years.

Alexandridis et al. (2010) measured the gains from acquisitions of listed targets around the world using a sample of 4,577 deals in 39 countries over the period 1990-2007. To capture the acquisition gains the event study methodology was used. Acquirer abnormal returns and target abnormal returns were estimated over the five-

day (-2, 2) event-window using the market-adjusted return model with each country's Datastream value-weighted market index as market benchmark. Furthermore, the total acquisition gains were also estimated for the combined firms. For the whole sample, acquirer CAR was statistically significant and equal to -0.91%. Acquirers of cash deals earned about 0.72%, whereas acquirers of stock and mixed/other deals lost -1.61% and -1.05% in the five-day CAR, respectively. With respect to the transaction region, for the whole sample acquirers in the U.S.A., the U.K., and the Canada statistically significantly lost value. On the other hand, acquirers in the Europe (excluding U.K.), the Japan and the South America experienced statistically significant gains. Splitting the sample into two sub-categories, acquirers in the U.S.A., the U.K. and the Canada (UUC) experience significantly negative CARs (-1.38%), whereas acquirers in the rest of the world (RoW) experience significantly positive CARs (1.56%). Therefore, RoW acquirers experienced significantly higher abnormal returns (about 2.93%) relative to the UUC acquirers. Moreover, for the whole sample, target CAR was statistically significant and equal to 17.65%. In the five-day window, targets of cash deals earned about 24.41%, whereas targets of stock and mixed/other deals gained 14.05% and 17.22%, respectively. With respect to the transaction region, for the whole sample targets in the U.S.A., the U.K., and the Canada statistically significantly created value (19.65%), whereas targets in the rest of the world also created value (9.04). Hence, RoW targets presented significantly lower abnormal returns (about -10.61%), relative to the UUC targets. The results for the combined entities, indicated that combined CARs were significantly positive for the whole sample (1.45) and significantly higher (by about 1.38%) for the RoW combined firms.

The results of the cross-sectional analysis indicated that the competition negatively affected the acquirer CAR for the whole sample, the RoW and the UUC. For the whole sample, the legal protection, the stock financed deals, the acquirer size, the relative size and the competing bidder were negatively associated with acquirer's CARs whereas the inter-industry deals and the market's past performance were positively associated with the acquirer CARs. With respect to the target CARs, for the whole sample, the competition, the legal protection, the institutional ownership, the percentage of independent directors, and the hostile deals were positively associated with target CARs, whereas stock financed deals, the target size, the relative deal size, and the market's past performance were negatively associated with target CARs. For the whole sample, bid premiums were positively associated with the competition, the legal protection, the percentage of institutional ownership, the percentage of independent directors, the acquirer market-to-book value, the inter-industry deals, the hostile deals and the competing bidder but they were negatively associated with the acquirer size, the relative size and the market's past performance. In the cross-sectional models there were differences on the sign and the magnitude of the coefficients between the two-sub categories (UUC and RoW) of deals. Finally, they concluded that the degree of the competition affected the distribution of gains between acquiring and target firms.

Craninckx and Huyghebaert (2011) investigated whether the stock markets predict the failure of mergers and acquisitions. The dataset contained 603 mergers announced by European acquirers (EU-27) involving targets from EU-27 countries over the period 1997-2006. The event-study methodology was used to assess the abnormal returns Cumulative abnormal returns were estimated using the market model with the S&P Europe 350 as market benchmark. Furthermore, the combined abnormal returns were also computed for the combined firms. The M&A failure was measured by the buy-and-hold abnormal returns (negative two-year BHARs implied M&A failure), the abnormal operating performance (negative two-year abnormal operating performance implied M&A failure), and the target divestment. For the sample of public targets, the three-day CAR (-1,1) was significantly positive and equal to 7.56% for targets and 1.096% for the combined entity. Acquirer's CARs for merger of listed targets were insignificantly different from zero. For private targets, the acquirer three-day CAR (-1,1) was significantly positive and equal to 0.779%. Furthermore, the results indicated that for listed targets, investors could predict M&A outcome given that there was a significantly negative association between short-term abnormal returns and the likelihood or the magnitude of failure. For private targets, there was no evidence for the above association.

Martynova and Renneboog (2011) evaluated the performance of takeovers in the Europe. The sample was consisted of 2,419 deals for bidder or targets that were listed on European stock exchanges, involving firms from 28 European countries, over the period 1993-2001. The event-study methodology was used to estimate the cumulative abnormal returns upon takeover announcements in the three-day event window (-1,1). For the estimation of CARs the market model with the MSCI-Europe index as benchmark was estimated. The results showed that takeover announcements were associated with significant value creation in the three-day window (-1, 1) both for targets (12.47%) and for acquirers (0.72%). Domestic deals were associated with significant higher acquirer abnormal returns (about 0.36%) compared to cross-border deals. Higher abnormal returns for domestic deals were also experienced by targets (by about 1.02%). Friendly deals were associated with significant higher (lower) abnormal returns for acquirers (targets) by about 1.89% (-13.03%). With respect to the determinants of value creation, the results derived from cross-sectional analysis indicated that deal hostility positively (negatively) affected the target (acquirer) CARs. The acquisition of private targets positively affected the acquirer's CARs whereas the selection of equity as mean of payment negatively affected both the bidder and target CARs. The comparison of takeovers between the UK and the Continental Europe indicated that target CARs were higher in the U.K. and that the presence of a large shareholder in the acquirer firm was positively (negatively) associated with takeover returns in the U.K. (Continental Europe). Hence, they argued that the differences in corporate governance systems between the U.K. and the Continental Europe affected the different effect of large shareholders on the performance of takeovers.

Humphery-Jenner and Powell (2011) analyzed both the announcement valuation effects and the long-run operating performance for Australian acquirers. The sample was consisted of 1,900 acquisitions in Australia over the period 1993-2007. The market reaction was estimated with the three-day (-1, 1) Cumulative Abnormal Returns (CARs) upon the announcement date using the market model. For robustness, dollar CARs, value-weighted CARs and combined CARs (for acquirers and targets) were also calculated. The post-acquisition operating performance was estimated using the acquirer three-year industry adjusted ROA. For the whole sample over the entire period, Australian acquirers earned significant CARs that equal to 1.516%. For large acquirers (acquirers with market capitalization that exceeded the 25th percentile capitalization of the Australian listed firms), the results indicated that large acquirers presented significantly lower (by -2.57%) CARs compared to the small acquirers. Results derived from the multivariate analysis indicated that acquirer size was significantly negatively associated with the CARs Moreover, both relative size and private stock were significantly positively associated with acquirer CARs, whereas both leverage and hostile deals were significantly negatively associated with CARs. Overall, the results showed that although large acquirers made more profitable acquisitions, small acquirers presented significantly higher CARs compared to the large acquirers.

Alexandridis et al. (2012) investigated the changes in M&As during the sixth merger wave (2003-2007). The sample was consisted of 3,206 U.S. deals during the period 1993-2007. They computed abnormal returns for both acquirers and targets using the market model with the CRSP value-weighted index as market benchmark. Total acquisition gains for bidder and target firms were also estimated. The long-run performance was estimated both with the average calendar-time abnormal returns using the 25 size and book-to-market equity portfolios as benchmark and with the four-factor model. For the whole sample, the results indicated statistically significant and negative acquirer CAR in the three-day event window (-1, 1) that equal to -1.50%. Acquirer's CARs over the period 2003-2007 (sixth merger wave) were significantly lower (by about -0.49%) compared to those during the period 1993-1999 (fifth merger wave); However, in general, acquirers still destroyed value at least as much value was destroyed during the fifth merger wave. They stated that the value destruction for acquirer shareholders was due to the high cash balances that intensified the cash flow problem as well as due to the relatively less optimistic investors compared to the 1990s wave. Furthermore, for the whole sample, the results indicated statistically significant and positive target CAR in the three-day event window that equal to +19.47%. Target CARs over the period 2003-2007 (sixth merger wave) were significantly higher (by about 2.39%) compared to those during the period 1993-1999 (fifth merger wave). However, the combined CARs were insignificantly different between the two sub-periods over the fifth and the sixth merger wave. Cross-sectional analysis showed that sixth merger wave was significantly negatively associated with acquisition premiums. During the sixth

merger wave, they showed lower competition in the market for corporate control, less overvalued acquirers relative to targets, higher cash elements for mergers proposals, and lower bid premiums which implied more rational decisions towards M&As.

Baker et al. (2012) analyzed whether past operating performance affected the valuation effects of M&A announcements. Specifically, the market reaction upon merger announcements was investigated by the hypotheses of managerial ability, empire-building, and CEO overconfidence. The dataset was consisted of 1,066 deals by Canadian acquirers listed on Toronto Stock Exchange over the period 1993-2003. Short-term performance was evaluated using the event study methodology. Cumulative abnormal returns were estimated in several event-windows (e.g. (-1,1), (-2,2) and (-5,5)) using the market model. The results indicated that, for the whole sample, three day CARs (-1, 1) were statistically significant and equal to 0.0139% whereas for acquirers made single acquisitions the three-day CARs equal to 0.0144%. The results from the cross-sectional analysis showed that operating performance was significantly negatively associated with acquirers' CARs. Moreover, three-day CARs were positively affected by the relative size, the percentage cash payment, but they were negatively affected by the public status of target firms. With respect to the corporate governance characteristics, the results showed that media-based CEO overconfidence was negatively associated with acquirer CARs. The board size, the percentage of inside directors, and the director ownership was not directly associated with acquirer CARs. However, they argued that the fraction of insider directors contributed to the alleviation of negative effects of past performance on acquirer's CARs.

Danbolt and Maciver (2012) evaluated the wealth effects of mergers by analyzing cross-border versus domestic acquisitions. The dataset contained 397 acquisitions (251 targets and 146 bidders involving UK companies) over the period 1980-2008. The wealth effects were estimated using the event-study methodology. Both the market model with various home country stock market indices as benchmarks, and the market-adjusted model were used to estimate the cumulative abnormal returns over the three-day (-1,1), and the eleven-day (-5, 5) event windows. The results indicated that target eleven-day CAR was significant positive both for cross-border (26.4%) and for domestic deals (13.2%). However, cross-border deals were associated with significantly higher target abnormal returns (13.1%). Acquirer-eleven day CAR was significantly negative only for domestic deals (1.34%). In the three-day CAR (-1,1) acquirer CAR was significantly higher for cross-border deals.

Golubov et al. (2012) investigated the effect of financial advisors on M&As. Using a sample of 4,803 U.S. deals over the period 1996-2009, they analyzed whether financial advisors affect the shareholder wealth. CARs were estimated using the market model with the CRSP value-weighted index as market benchmark. For robustness, both the market –adjusted model and the CRSP equally-weighted index

were also used in various event-windows surrounding the M&A announcements. They argued that top-tier advisors were significantly positively associated with acquirer returns but only in case of acquisition of public targets. Specifically, using top-tier advisors was associated with an average 1.01% increase in acquirer's CARs that was translated into on average $65.83 mil. shareholder value. The shareholder gains from using top-tier advisors can be explained by the top-tier advisors' ability of identification the synergistic combinations (hypothesis of better merger) that created a large share of synergy gains for acquirers (hypothesis of skilled negotiation). Moreover, they concluded that paying for top-tier advisors in public acquisitions was associated with value creation.

Alexandridis et al. (2013) evaluated the association between deal size, acquisition premiums and shareholder wealth. The dataset contained 3,691 U.S. acquisitions of public targets during the period 1990-2007. Acquirer gains were estimated using the event study methodology and the cumulative abnormal returns were calculated both in the three-day (-1, 1) and the forty-one day (-20, 20) windows with the market model using the CRSP value-weighted market index as benchmark. Bid premiums were measured as the ratio of offer price to the target share price four weeks prior to the deal announcement. The results from multivariate analysis indicated that market-relative target size was significantly negatively associated with the acquisition premiums. Specifically, they found that premiums were significantly negatively associated with target size which suggested that acquirers paid significantly lower premiums for large target firms. The results for the acquirer gains over the three-day window (-1,1) showed that on average acquirers lost about -1.51% over the entire period. With respect to the target size, the three-day acquirer CAR was insignificant for the acquisition for small targets but was statistically significant and negative both for the acquisition of medium (-1.08%) and the acquisition of large (-2.82%) targets. Overall, acquirer gains were significantly lower (by about -2.37%) for the acquisition of large targets, relative to the acquisition of small targets. The above findings, with different magnitude, remained robust using the (-20, 20) event window. The results of the cross-sectional analysis for the acquirer gains showed that target size was significantly negatively associated with the acquirer abnormal returns. Therefore, acquirers destroyed more value for the acquisition of large targets, relative to the acquisition of small targets. Moreover, offer premiums, stock-financed deals and acquirer market-to-book equity ratio were significantly negatively associated with the acquirer value, whereas the market-relative acquirer size was significantly positively associated with acquirer value. Finally, they argued that acquirer returns may reflect concerns about the potential and/or the complexity of the acquisitions.

Jansen et al. (2013) evaluated the relationship between relative deal size and acquirer's shareholder value upon merger announcement using a sample of 15,355 deals in the U.S.A. over the period 1980-2008. The cumulative abnormal returns were estimated over a three-day window (-1,1) using the adjusted market model with the

CRSP equally weighted index as market benchmark. Relative deal size was measured by the ratio of the deal value to the acquirer market value of equity. The results of the multivariate analysis indicated that for the whole sample the relative deal size was positively associated with acquirer shareholder value. However, by using interactions of the relative size with other characteristics (acquirer size, method of payment and public/private status of targets), the results became different. Specifically, the signs of interaction terms were depend on whether the specific acquisition characteristics were associated with positive or negative abnormal returns. They concluded that the relative deal size was positively associated with acquirer shareholder value for value-increasing deals but was negatively associated with shareholder value for value-decreasing deals. Therefore, the relative deal size had higher explanatory power on acquirer's CAR when regression models contained the relative size with interactions.

Duchin and Schmidt (2013) evaluated the performance, the uncertainty, the quality of analysis and the acquirers' governance quality for mergers initiated in- and out-merger waves. Using a sample of 9,854 U.S. acquisitions over the period 1980-2009, they found that the forecast errors was significantly higher for mergers in wave, whereas the cumulative abnormal returns upon announcements were insignificantly different between mergers initiated during merger waves and those initiated out-of waves. Uncertainty, measured by the implied volatility, was significantly higher for in-wave mergers. Buy and hold abnormal returns were significant negatively affected by merger waves, indicating the existence of poor long-run performance for acquisitions that were initiated during merger waves. Finally, corporate governance for in-wave acquirers was weaker compared to the corporate governance of out-wave acquirers.

Alexandrou et al. (2014) investigated the wealth effects of mergers and acquisitions in the shipping industry. The sample was consisted of 2,036 deals in the shipping industry from 67 countries over the period 1984-2011. The event study methodology was used to assess the wealth effects of M&As. Market model was used for the estimation of abnormal returns with a suitable nation index or the World Marine Transportation Index. According to the results for the five-day event window (-3, +1), acquirers experienced significantly positive CARs of 1.2% whereas targets earned statistically significant CARs of 3.3%. Therefore, they argued that M&As were associated with value creation both for acquirers and targets. Furthermore, higher value creation was captured for targets in North America and acquirers in Asia. Targets, experienced higher value in cross-border deals and focus-increasing M&As whereas acquirers experienced higher gains in cross-border deals, in acquisition of public targets and in deals using stock as mean of payment.

Andriosopoulos and Yang (2015) evaluated the effect of institutional investors on M&As in the U.K.. The sample contained 3,697 completed deals over the period

2000-2010. Cumulative abnormal returns were estimated in various windows using the single market model. For the whole sample, the three-day (-1,1) CAR was statistically significant and equal to 0.75%. The results showed that institutional investors were positively associated with the likelihood of large, cross-border and full-control deals. The likelihood of cross-border deals was increased both by institutional ownership concentration and foreign institutional ownership. Results from multivariate analysis for the bidder CARs indicated that cross-border deals were significantly negatively associated with CARs.

Betzer et al. (2015) investigated the relationship between stock and accounting performance of acquisitions. Using a sample of 4,547 acquisitions in the U.S.A. over the period 1989-2008, they analyzed the bidder, deal, and target characteristics with respect to the stock and accounting performance. Bidders' abnormal accounting performance was measured by the acquirer operating cash flow over portfolios of matched firms whereas acquirer abnormal stock returns were measured as the five-day (-2, 2) cumulative abnormal returns centered upon the announcement day. The cumulative abnormal returns were estimated using the market model with the CRSP value-weighted index as market benchmark. The results indicated that acquisitions with positive both accounting and stock abnormal performance were motivated by exploitation of synergies, acquisitions with positive stock performance. Negative abnormal performance was motivated by preemption, acquisitions with positive accounting abnormal performance whereas negative stock abnormal returns were motivated by the overvaluation of the bidder's stock and market timing. Acquisitions with negative both accounting and stock abnormal performance were motivated by bad corporate governance.

Black et al. (2015) estimated the gains of Chinese acquirers and analyzed the differences between domestic and foreign acquisitions. The sample contained 458 deals that were announced from acquirers listed on either the Shenzhen or the Shanghai stock exchange, over the period 2000-2009. The short-run performance was calculated in the three-day event window using the market adjusted model with the Shanghai stock index as market benchmark. The long-run performance was calculated in the 24-month period using the buy-and-hold (BHAR) approach with the size-adjusted process for the portfolio return. The results for the three-day CARs showed significant and positive abnormal returns for domestic deals (2.76%) but insignificant abnormal returns for foreign deals. However, domestic deals were associated with significantly higher abnormal returns by about 3.34%, relative to the foreign deals. The significantly higher short-run returns for domestic deals were also presented in the sub-sample of small deals. For the whole sample, the results of long-run analysis indicated that domestic deals were associated with significant and negative BHARs that equal to -7.98%, whereas foreign deals were associated with insignificant BHARs. Furthermore, there was not statistically significant difference in BHARs between domestic and foreign acquisitions. However, for large foreign acquisitions

there was a significant and positive long-run outperformance (by 29.81%) compared to domestic large deals. Moreover, large foreign acquisitions were associated with significantly higher BHARs by about 30.01% compared to small foreign acquisitions. The results from the cross-sectional analysis indicated that foreign acquisitions were significantly negatively associated with acquirer CARs, but they were insignificantly associated with the long-run performance.

Andriosopoulos et al. (2016) evaluated the valuation effects of M&As in the U.K.. The dataset was consisted of deals announced by 2,582 U.K. listed companies over the period 2000-2010. Acquirers were separated into three sub-categories (value, moderate and glamour bidders) based on the equally weighted market-to-book value terciles. The short-term market reaction was assessed using the event-study methodology. Abnormal returns were estimated using the market model with the FTSE All Share as index for the market portfolio. For the whole sample, the three-day CARs were statistically significant and equal to 0.598%. Domestic M&As experience significantly higher abnormal returns (by about 0.40%) relative to cross-border deals, whereas value acquirers experience significantly higher abnormal returns (by about 0.527%) relative to glamour bidders. The above results were robust using alternative event-windows surrounding the deal announcements. With respect to the levels of institutional ownership, the results showed that acquirers with higher levels of institutional ownership (foreign, low-turnover and domestic institutional ownership) experienced lower abnormal returns upon M&A announcements. However, they suggested that domestic institutional ownership was associated with higher post-announcement returns.

Golubov et al.(2016) evaluated the effect of stock method of payment on the performance on mergers and acquisitions. The sample was consisted of 2,576 deals announced by U.S. acquirers and targets over the period 1985-2009. Given that stock-financed deals could be considered as a special case of Seasoned Equity Offerings (SEOs), to capture the “pure” effect of stock-financed deals, they also used a sample of SEO announcements. In this spirit, stock-financed deals can be explained by two distinct factors and specifically by both the takeover and the equity issue components. Cumulative abnormal returns were estimated in the five-day (-2,2) event window using the market model with the CRSP value-weighted index as market benchmark. For the whole sample, the results of the event study analysis indicated that the mean CAR was statistically significant and equal to -1.31%. Cash-financed (stock-financed) M&As were associated with statistically significant CARs that equal to 0.50% (-2.29%). However, they argued that, net of the effect of the SEO announcement returns, stock-financed M&As were not value destructive. Therefore, the method of payment in M&As had no further explanatory power on acquirer returns and this result was contrary to the agency costs of overvalued equity hypothesis.

Alexandridis et al. (2017) investigated the wealth effects of mergers and acquisitions exploring differences over the post-2009 period. The dataset was consisted of 26,078 U.S. mergers and acquisitions over the period 1990-2015, out of which the 20,384 M&As referred to the acquisition of private targets and the remainder were public deals. Acquirer gains were analyzed with respect to two sub-periods (1990-2009 and 2010-2015) and were estimated with the event study methodology using the market model for the three-day (-1,1) event window. The results showed that CARs were statistically significant and equal to 1.21% over the 1990-2009 whereas equal to 1.42% over the 2010-2015 period. Over the most recent period the CARs were significantly higher by about 0.21%, relative to the period 1990-2009. The difference between the two sub-periods was mainly induced by the sub-set of public deals which on average were associated with 2.13% higher abnormal returns over the 2010-2015 compared to those over the period 1990-2009. Specifically, acquirers of public targets gained CARs of 1.05% during the post-2009 period whereas they lost about -1.08% over the 1990-2009 period. In contrast, for private deals there was insignificant difference in median CARs between the two sub-periods. Overall, an average acquirer earned about $30.22 mil. market gain in the three-day event window in the post-2009 period. Acquirer gains were more pronounced for mega deals ($500 mil. or more). The results of cross-sectional analysis over the entire period showed that the 2010-2015 dummy and the relative size had a positive and significant impact on acquirer CARs. On the contrary, acquisition of public targets, usage of stock as method of payment, acquirer size and serial acquirer control were significantly negatively associated with acquirer value. Finally, they stated that in post-2009 period acquirers employed more efficient investment allocation strategies and they argued that acquirer gains, in the more recent period, were linked with improvements in the quality of acquirer corporate governance.

Cuypers et al. (2017) evaluated the effects of experience and information asymmetries on value creation from M&As. The sample contained 1,241 deals that were announced by U.S. firms listed on NYSE or NASDAQ over the period 1980-2009. The value creation of M&As was assessed with the event-study methodology and specifically abnormal returns both for acquirers and targets were estimated. Cumulative abnormal returns were calculated with the market model over a 21-day event-window (-10,10) centered on the announcement date. For robustness, also shorter event-windows (e.g. (-5, 5), (-3, 3) were used. The total value of the M&A for both bidder and targets was also calculated. The results showed that acquirers lost about -$107.72 mil (CAR equal to -3.5%), whereas targets obtained about $75.88 mil (CAR equal to 18.3%). The total M&A value was -$31.84 mil (or -0.7%). The 35.9% (85.9%) of deals was associated with value creation (positive value) for acquirers (targets). The cross-sectional for acquirer value showed that acquirers obtained higher value when their M&A experience was higher relative to the targets' experience. Furthermore, the differential M&A experience between acquirers and

targets affected the value creation of each party. Therefore, the M&A gains explained by both acquirer and target relative experience.

Adra and Barbopoulos (2018) examined the valuation effects of investor attention upon stock-financed acquisitions. The dataset contained 513 U.S. M&As (public-to-public deals) over the period 2002-2014. Announcement wealth effects were assessed using the market adjusted model over the five-day (-2,2) event window with the value-weighted returns of NYSE firms. The results showed that acquirer's CAR equal to 0.23%, confirming the results of prior studies which indicated that M&As did not offer added value to the acquirers' shareholders. The post-acquisition was measured using the buy-and-hold abnormal returns (BHARs) methodology for holding periods of 12 and 24 months after the deal completion. The results indicated that the BHARs in 24 months after the deal completion equal to -6.33%. They argued that investor attention affected the market reaction to takeovers. Limited investor attention provided incentives to overvalued acquirers in order to engage in stock-financed acquisitions of listed targets. Although, in case of low attention, these overvalued acquirers had limited announcement wealth losses, the overvaluation was corrected in the post-announcement period. On the contrary, in case of high investor attention, overvalued acquirers of stock-financed acquisitions of public targets were associated with statistically significant but negative announcement abnormal returns. Overall, they suggested that the wealth losses for stock-financed M&As were driven by acquirers that received high investor attention.

Amewu and Alagidede (2018) measured the value creation upon M&A announcements for acquirer shareholders in Africa's emerging markets. The sample was consisted of 245 merger announcements from acquiring firms that operated in 14 African countries over the period 2002-2015. They estimated the short-term performance using the event-study methodology. Specifically, given that the stock markets absorb the information differently, they used several event windows surrounding the merger announcements that varied from the three-day CAR (-1,1) to the fifty-one day CAR (-25, 25) in order to captured evidence for potential information leakage upon the deal announcements. Abnormal returns were estimated using the market model with the equally weighted market index as proxy for market benchmark and the significance of cumulative abnormal returns was assessed using the cross-sectional t-test, the Patell Z test (Patell, 1976), the generalized sign test (Cowan, 1992), and the non-parametric generalized rank test of Kolari and Pynnonen (2011). They found significant positive abnormal returns on the day of the announcement (day zero) both for the African and the South African deals. Cumulative abnormal returns for the three-day (-1,1) window were significantly positive and equal to 2.65%, 2.89% and 0.04% for African, South African and other African acquirers, respectively. The results derived from multivariate analysis showed that acquirers from the financial industry, deals from firms that belonged to the same industry, cross-border deals, acquisition of private firms and stock

acquisitions were significantly associated with abnormal returns for the South African acquirers. On the contrary, for the African acquirers, cumulative abnormal returns were affected by industry focused deals and cross-border deals. Furthermore, South African acquirer value was significantly affected by market capitalization and ROE, whereas African acquirer value was significantly affected by the bidder market capitalization.

Jain et al. (2019) evaluated the wealth effects of cross-border acquisitions announced from Indian and Chinese firms over the period 2001-2017. The sample contained 553 deals that were announced by Indian acquirers and 125 deals that were announced by Chinese acquirers. The estimation of the wealth effects was assessed using the event-study methodology. Specifically, the cumulative abnormal returns over the three-day window (-1,1) were estimated using the market model. Several statistical tests (cross-sectional t-test, Patell Z test, standardized cross-sectional BMP Z-test, generalized sign Cowan Z-test and Rank Corrado Z-test) were used to investigate the significance of the abnormal returns. They found a significantly positive three-day (-1,1) average cumulative abnormal return that equal to 1.26% for Indian acquirers and to 1.61% for Chinese acquirers. Estimating the wealth effects of merger announcements with regard to the deal characteristics showed differences in the market reaction between the two regions (China and India). Specifically, related deals yielded higher returns in India whereas unrelated deals yielded higher returns in China. Over the three-day (-1, 1) event window upon the deal announcements, cash deals yielded higher returns for Indian companies whereas non-cash deals yielded higher returns for Chinese firms. On the other hand, same patterns of abnormal returns were found with respect to the public status of targets given that over the three-day window acquirers of private targets were associated with higher cumulative abnormal returns for both countries. Finally, deals with targets that located in developed markets and deals that provide full control in target firms (special resolutions) were associated with higher cumulative abnormal returns (-1 , 1) both for Indian and for Chinese bidders.

Chircop and Tarsalewska (2020) evaluated the impact of targets' 10-k filing length on the acquirer shareholder wealth. They hypothesized that on one hand the longer 10-k filings provided better information to acquirers and therefore reduced the cost of information acquisition but on the other hand longer 10-k filling influenced the shareholder information acquisition and the corresponding processing costs. The dataset contained 605 M&As for U.S. public acquirers of U.S. public targets over the period 1997-2013. Shareholder wealth was calculated using both the acquirer's CARs and the Synergy gains for combined firms. CARs were estimated over the three-day event window (-1, 1) using the market model. The length of targets' 10-k filling was estimated using the mean number of words in targets' 10-k fillings for three years prior to the deal announcement. With respect to the univariate analysis, to test the impact of 10-k filling length on shareholder wealth, deals were divided into four quartiles with respect to the number of words in targets' 10-k fillings. The results

indicated that acquirer's CARs (synergy gains) for deals in the bottom (1^{st}) quartile were significantly lower than CARs (synergy gains) for deals in the top (4^{th}) quartile by about -1.013% (-0.015%). The results of the cross-sectional analysis indicated that, after controlling for several acquirer-specific, target-specific, and deal-specific factors, the targets' 10-k filling length was significantly positively associated with both CARs and Synergy gains. Hence, the effect of reduction in information acquisition costs exceeded the effect of increase in information processing costs. The above relationship was even stronger both when acquirers had limited access to private information regarding the target firms and when 10-fillings contained information denoting risk. On the contrary, the relationship was weaker in case that ether 10-k fillings contained complex text or financial statements characterized by high accounting quality.

Aktas et al. (2021) evaluated the effect of credit rating on acquisitions. The sample contained 6,331 U.S. acquisitions over the period 1990-2019. Abnormal returns were estimated using the market-adjusted model with the value-weighted CRSP index as market benchmark. For the whole sample, three-day (-1,1) CARs were statistically significant and equal to 0.83%. Furthermore, they argued that the relationship between credit rating and acquisitions was curvilinear implying that acquisition activity first increased and then decreased with the improvement of credit ratings. The opposite pattern was presented in the relationship between abnormal returns and credit ratings. Specifically, abnormal returns first decreased and then increased with the improvement in credit ratings. Overall, they argued that credit ratings significantly affected the acquisition activity whereas they also supported that the acquisition activity of highly-rated firms was negatively associated with the future ratings.

Barbopoulos and Danbolt (2021) analyzed the effect of earnout contracts on the outcome of mergers and acquisitions. Earnout contracts constitute a mechanism of payment for M&As through which a relative large part of the deal value is paid to targets in multiple stages after the merger announcements and depends on the target performance in future pre-specified periods. To estimate the short-run M&A performance they conducted an event study analysis using the market-adjusted model with the value-weighted market return as benchmark portfolio. For UK acquirers the FTSE all share index was used whereas for U.S. acquirers the Datastream US index was used. Cumulative abnormal return were estimated over the five-day (-2,2) event window surrounding the merger announcement. For robustness, additional asset pricing models (market model, CAPM, three-factor model and four-factor model) were also used. The sample consisted of 31,214 merger announcements by U.K. (9,577) and U.S. (21,637) acquirers over the period 1986-2016 and 5,008 of the total deals included earnouts. The results from univariate analysis indicated that merger announcements were associated with significant abnormal returns that equal to 1.72% on the five-day (-2,2) event window. Significant positive CARs were presented both for private targets (1.61%) and for subsidiary targets (1.93%). For the whole sample,

earnout M&As were associated with significant CAR equal to 1.57% where non-earnout M&As were associated with significant CAR equal to 1.74% and the difference in CARs between the above subgroups was insignificant. However, earnout M&As earned significantly higher abnormal returns relative to cash deals but significantly lower abnormal returns relative both to stock and mixed deals. Results from multivariate analysis showed the heterogeneity among eanout-based deals with respect to several deal and acquirer characteristics. The propensity-score matching technique and the entropy balancing technique were used for addressing self-selection bias. They argued that earnout-based deals created more value for older and larger bidders that engaged in deals with relatively small target firms and that earnout-based deals for foreign acquirers and those advised by top-tier or boutique advisors were associated with higher abnormal returns.

Bhabra et al. (2021) analyzed the effect of Sarbanes-Oxley Act (SOX) on the acquisition of private targets in the U.S.A.. The dataset was consisted of 10,809 completed mergers between public acquirers and private targets over the period 1990-2015. They applied the event-study methodology for the estimation of acquirer short-term price performance. Cumulative abnormal returns were calculated using the market model with the CRSP equally-weighted index as market benchmark. As main event-window they used the three-day (-1,1) window whereas the five-day abnormal returns (-2, 2) were also estimated. The impact of SOX on the acquirer value was captured using a dummy variable that was assigned to 1 for deal announcements in the post-SOX period, and 0 otherwise. The results showed that in the pre-SOX period the three-day CAR was significant positive and equal to 2.06% whereas in the post-SOX period the CAR equal to 1.21%. The difference in CAR between pre-SOX and post-SOX period was significant (equal to -0.84%) and indicated that after the passage of SOX the acquirer CAR was significantly lower relative to the pre-SOX period. This finding was also supported for the five-day event window (-2,2) and even after excluding deal announcements from IT or highly regulatory (financial sector / utilities) acquirers. The results of cross-sectional analysis showed that deals in the post-SOX period were negatively associated with acquirer abnormal returns. Furthermore, there was a negative impact of free cash flow, Tobin's Q and cash deals on the acquirer's returns but a positive impact of operational efficiency, deal size and time to completion on acquirer's value.

Table 2 presents the summarized results derived from the literature review with respect to the market reaction upon corporate Mergers and Acquisitions (M&As).

Table 2. Empirical results for the market reaction to corporate M&As

Year	Authors	Research Aim	Events	Sample Period	Country	Event-study methodology	Results
2002	Fuller et al.	Estimation of the CARs of multiple acquirers with respect to the method of payment and the target public status	3,135 M&As	1990-2000	U.S.A.	Market-adjusted model using the -weighted market index as benchmark. CARs were estimated across the five-day (-2,+2) event window	Merger announcements created significantly positive average (median) five-day CARs that equal to 1.77% (1.07%) over the 1990-2000 period. The acquisition of public (private) targets was associated with significantly negative (positive) abnormal returns.
2004	Goergen and Renneboog	Evaluation of the wealth effects of European deals	228 M&As	1993-2000	European firms	CAPM using alternative ways for the beta estimation. Various event-windows are estimated	Significantly positive announcement wealth effects. The two-day event window (-1 ,0) equal to 9% for the targets and 0.7% for the bidders.
2004	Mitchell et al.	Investigation of price pressure around merger announcements	2,130 M&As	1994-2000	U.S.A.	Market model using the value-weighted CRSP index as market benchmark. CAARs are estimated upon the announcement and the closing date as well as over the pricing period	Significantly positive announcement CAAR on the (-1,+1) window for cash deals that equal to 0.96% but significantly negative CAAR for both fixed-exchange-ratio mergers (-2.73%) and collar deals (-0.88%). During the pricing period, CAARs were significantly negative (-3.18%) for floating-exchange-ratio stock mergers. There was price pressure effect which was short-lived.
2004	Moeller et al.	Evaluation of the effect of merger announcements on shareholder wealth	12,023 M&As	1980-2001	U.S.A.	Market model with the CRSP equally-weighted as market benchmark	Three-day announcement CAR(-1, +1) was significant and equal to 1.1%. The median abnormal return was significant and equal to 0.36%. The average dollar change in the wealth of bidding firm shareholders was negative (-$25.2millions). Small bidders gained significantly higher abnormal returns compared to large bidders.
2007	Antoniou et al.	Investigation of the wealth effects for firms involving in many acquisitions	1,401 M&As	1987-2004	U.K.	Market adjusted model with the value-weighted market index as benchmark and Calendar Time Abnormal Returns (CTARs) using the 25 size and B/M portfolios	Five-day (-2, +2) CARs were significantly positive and equal to 1.26%. Both cash and non-cash acquisitions were associated with significant positive abnormal returns. Acquirers earned significant CARs their first bids (1.66%) but insignificant CARs for the firth and/or higher order bids.
2007	Doukas and Petmezas	Evaluation of the role of manager overconfidence on acquirer abnormal returns	5,334 M&As	1980-2004	U.K.	Market adjusted model with the value-weighted market index as benchmark	Significant CARs in the five-day window (-2, +2) for the whole sample (1.00%). Acquirers of private (public) targets presented significant positive (negative) CARs that equal to 1.18% (-0.90%). Deals from acquirers with overconfident managers created lower abnormal returns.
2010	Alexandridis et al.	Estimation of the gains of acquisitions around the world	4,577 M&As	1990-2007	39 countries	Market-adjusted return model with each country's Datastream value-weighted market index as market benchmark	For the whole sample, acquirer (target) CAR was statistically significant and equal to -0.91% (17.65%). Acquirers (targets) in U.S., U.K. and Canada (UUC) experienced negative (positive) CARs that equal to -1.38 (19.65%) whereas acquirers (targets) in the rest of the world (RoW) experienced positive CARs that equal to 1.56% (9.04%).
2011	Craninckx and Huyghebaert	Evaluation of the association between short-term valuation effects and M&A failure	603 M&As	1997-2006	EU-27	Market model with the S&P Europe 350 as market benchmark. Combined abnormal returns are also computed	For public targets, the three-day (-1,+1) target (combined entity) CAR was significant positive and equal to 7.56% (1.096%). For public (private) targets, the acquirer three-day CAR was insignificant (significant and equal to 0.779%).

2011	Humphery-Jenner and Powell	Evaluation of the impact of acquirer size on the valuation effects of M&As	1,900 M&As	1993-2007	Australia	CARs were estimated using the market model. Dollar CARs, value-weighted CARs, combined CARs, and the post-acquisition operating performance were also calculated	Three-day CARs were statistically significant and equal to 1.516%. Although large acquirers made more profitable acquisitions, small acquirers presented significantly higher CARs compared to the performance of large acquirers.
2011	Martynova and Renneboog	Evaluation of the performance of takeovers in Europe	2,419 M&As	1993-2001	28 European countries	Market model with the MSCI-Europe index as benchmark	Significant and positive three-day CARs both for bidders (0.72%) and targets (12.47%). Deal hostility positively (negatively) affected the target (acquirer) CARs. The acquisition of private targets positively affected the acquirer CARs. The selection of equity as mean of payment negatively affected both the bidder and the target CARs.
2012	Alexandridis et al.	Evaluation of the differences in M&As during the sixth merger wave	3,206 M&As	1993-2007	U.S.A.	Market model with the CRSP value-weighted index as benchmark. Total acquisition gains and long-run performance were also estimated	Over the entire period, the three-day (-1,+1) CAR was significant and equal to -1.50%. Acquirer's CARs over the sixth merger wave were lower compared to during the fifth merger wave.
2012	Baker et al.	Evaluation of the relationship between past operating performance and short-run valuation effects	1,066 M&As	1993-2003	Canada	Market model	For the whole sample, three day CARs (-1, +1) were statistically significant and equal to 0.0139%. CARs equal to 0.0144% for acquirers with single acquisitions. Past operating performance was significantly negatively associated with acquirer CARs.
2012	Danbolt and Maciver	Investigation of the bidder and the target wealth effects between domestic and cross-border mergers	397 M&As	1980-2008	UK	Market model, using various home country stock market indices as benchmarks, and market-adjusted model	Target CAR in the (-5, 5) window was significant positive for cross-border (domestic) deals and equal to 26.4% (13.2%). Cross-border deals presented significantly higher target CARs. Acquirer's CARs in the (-5,5) window were significant negative only for domestic deals (1.34%). Acquirer's CARs in the (-1,+1) window were significantly higher for cross-border deals.
2013	Alexandridis et al.	Investigation of the association between deal size, premiums and acquirer gains	3,691 M&As	1990-2007	U.S.A.	Market model using the CRSP value-weighted market index as benchmark	Premiums were significantly negatively associated with target size. Acquirers significantly lost about -1.51% in the three-day window (-1,+1) over the entire period. Target (acquirer) size was significantly negatively (positively) associated with the acquirer abnormal returns.
2013	Duchin and Schmidt	Evaluation of the differences between acquisitions initiated in- and out- merger waves	9,854 M&As	1980-2009	U.S.A.	Market model using the CRSP value weighted index as market benchmark. CARs over the three-day (-1 , 1) and the seven-day (-3, +3) windows. BHARs using combined industry and matched firm benchmarks	Three-day CAR for the whole sample was significantly positive and equal to 0.90%. Insignificant differences in CARs between in-wave and out-wave mergers. Merger waves were significantly negatively associated with BHARs. Higher forecast errors, higher uncertainty, and weaker corporate governance were found for in-wave mergers.
2013	Jansen et al.	Evaluation of the impact of relative deal size on acquirer shareholder value	15,355 M&As	1980-2008	U.S.A.	Market-adjusted model with the CRSP equally weighted market index as benchmark	Relative deal size positively (negatively) affected the three-day CAR for value-enhancing (decreasing) deals. The impact of relative deal size on acquirer CAR can be explained better with interaction terms.
2014	Alexandrou et al.	Estimation of the wealth effects of M&As in shipping	2,036 M&As	1984-2011	67 countries	Market model using suitable nation index or the World Marine Transportation Index	In the (-3,+1) window both acquirers and targets experienced significant CARs that equal to 3.3% and 1.2%, respectively.
2015	Black et al.	Evaluation of the differences in M&A performance between domestic and foreign deals	458 M&As	2000-2009	China	CARs using the market adjusted model with the Shanghai stock index as market benchmark. BHARs for 24-month period with the size-adjusted process for the portfolio returns	Significant positive three-day CARs for domestic deals (2.76%). Domestic deals presented significantly higher CARs by about 3.34% compared to the foreign deals. Domestic deals presented significantly negative BHARs (-7.98%). For large foreign acquisitions there was a significant and positive long-run outperformance (by 29.81%) compared to domestic large deals.

2015	Betzer et al.	Evaluation of the relationship between the acquirer's abnormal accounting performance and the acquirer's stock performance.	4,547 M&As	1989-2008	U.S.A.	Market-adjusted model using the -weighted market index as benchmark. CARs were estimated over the five-day (-2,+2) window	Acquisitions with positive accounting and stock abnormal performance were paid mainly by cash and motivated by the exploitation of synergies. Acquisitions with negative accounting and stock abnormal performance were less likely to be paid by cash and were motivated by bad corporate governance.
2016	Golubov et al.	Evaluation of the effect of stock method of payment on the performance on mergers and acquisitions	2,576 M&As	1985-2009	U.S.A.	Market model with the CRSP value-weighted index as market benchmark	For the whole sample, five-day (-2,+2) CARs equal to -1.31%. CARs for cash-financed (stock-financed) M&As equal to 0.50% (-2.29%). However, net of the effect of the SEO announcement returns, stock-financed M&As were not value destructive.
2017	Alexandridis et al.	Evaluation of the wealth effects of mergers and acquisitions	20,384 M&As	1990-2015	U.S.A.	Market model	Three-day (-1, +1) CARs were statistically significant positive and equal to 1.21% (1.42%) over the 1990-2009 (2010-2015) period. Over the most recent period the CARs were significantly higher by about 0.21%. Acquirers of public targets gained CARs of 1.05% during the post-2009 period whereas they lost about -1.08% over the 1990-2009 period.
2017	Cuypers et al.	Evaluation of the impact of M&A experience on value implications of M&As	1,241 M&As	1980-2009	U.S.A.	Market model	CARs in the (-10,+10) window were negative for acquirers (-3.5%), positive for targets (18.3%), and negative for combined firms (-0.7%). The differential M&A experience affected the value creation of each party.
2018	Amewu and Alagidede	Analyzing the value creation from M&A in Africa	245 M&As	2002-2015	14 African Countries	Market model with the equally weighted market index as proxy for market benchmark	CARs in the (-1,+1) window were significantly positive and equal to 2.65%, 2.89% and 0.04% for African, South African and other African acquirers, respectively. CARs were affected by firm size and ROE.
2019	Jain et al.	Evaluation of the wealth effects of cross-border mergers	678 M&As	2001-2017	India & China	Market model	Three-day CARs were significantly positive and equal to 1.26% (1.61%) for Indian (Chinese) acquirers. Related (unrelated) deals created higher returns for Indian (Chinese) acquirers. Acquiring private targets, acquiring targets from developed economies and making special resolutions were associated with higher abnormal returns.
2020	Chircop and Tarsalewska	Investigation of the impact of targets' 10-k filing length on shareholder wealth	605 M&As	1997-2013	U.S.A.	CARs using the market model for acquirers and synergy gains for the combined firms	Targets' 10-k filling length was significantly positively associated with both CARs and Synergy gains. The effect of reduction in information acquisition costs exceeded the effect of increase in information processing costs.
2021	Barbopoulos and Danbolt	Evaluation of the effects of earnout-based deals in M&As	31,214 M&As	1986-2016	U.S.A. and U.K.	Market-adjusted model with the value-weighted market index as benchmark portfolio. Additional asset pricing models (market model, CAPM, three-factor model and four-factor model) were also applied	Five-day (-2,+2) CARs were significantly positive (1.72%) for the whole sample. Earnout (non-earnout) M&As presented CARs that equal to 1.57% (1.74%). Earnout M&As earned significantly higher CARs relative to cash deals but significantly lower CARs relative both to stock and mixed deals.
2021	Bhabra et al.	Investigation of acquirer returns before and after the Sarbanes-Oxley Act (SOX)	10,809 M&As	1990-2015	U.S.A.	Market model with the CRSP equally-weighted index as market benchmark	Three-day CAR was significant in the two-periods and equal to 2.06% in the pre-SOX whereas it equal to 1.21% in the post-SOX period. Post-SOX deals, free-cash flow, Tobin's Q and cash deals were negatively associated with CAR. Operational efficiency, deal size and time to completion were positively associated with CAR.

2.4. Corporate Governance Characteristics and Shareholder Wealth upon corporate M&As

M&As constitute a corporate area in which substantial agency conflicts between management and shareholders can be arisen (Dahya et al., 2019). In this context, empirical results toward the effects of corporate governance mechanisms on shareholder wealth are presented in the following paragraphs.

Masulis et al. (2007) examined the role of corporate governance mechanisms on the profitability of firm acquisitions. The sample contained 3,333 deals that were announced by 1,268 U.S. firms over the period 1990-2003. Acquirer returns were estimated using the market adjusted model with the CRSP equal-weighted index as market benchmark over the five-day (-2, 2) event window. The results indicated that, for the whole sample, acquirers earned statistically significant and positive abnormal returns of 0.215% in the five-day window. M&As that were financed by cash were associated with significantly positive CARs (0.798%), whereas M&As that were partially financed by stock were associated with significantly negative CARs (-0.292%). Acquisition of public (private) targets was associated with significantly CARs that equal to -1.484% (+0.76%). Moreover, antitakeover provisions were negatively associated acquirer CARs. They argued that acquirer firms with more anti-takeover provisions experienced statistically significant lower abnormal returns upon M&A announcements. On the contrary, acquirers with separating position between CEO and Chairman or acquirers operating in competitive industries experienced significantly higher abnormal returns upon M&A announcements. Specifically, with respect to the board characteristics, the results derived from multivariate analysis showed that CEO/Chairman duality was negatively associated with acquirer CARs, whereas both board size and boards with independent members more than 50% of directors had insignificant impact on acquirer's CARs. Finally, the management quality, measured by the operating income growth rate, was significantly positively associated with acquirer's CARs.

Malmendier and Tate (2008) evaluated the relationship between CEO overconfidence and market reaction upon M&As. The dataset contained 808 deals with full stock market data that derived from 394 large U.S. firms over the period 1980-1994. The level of CEOs' overconfidence was measured with the CEO's personal over-investment on their firm and the CEO's press portrayal. The market reaction to M&A announcements was assessed using the event-study methodology. Cumulative abnormal returns were estimated over the three-day event window (-1,1) with the market adjusted model using the S&P500 index as proxy for the market portfolio. The results showed that overconfident CEOs overestimate the ability of return generation and therefore were associated with value-destroying deals. Specifically, results derived from the event-study analysis showed that, for the whole sample, acquirer CAR was significantly negative in the three-day event window (-0.29%). The results

from cross-sectional for acquirer's CARs indicated that the vested option holding had a non-linear impact on the acquirer's CARs (positive in lower values but negative at high values). Furthermore, acquirer's CARs were negatively affected by bids of Longholders. Cash deals were significantly positively associated with acquirer value while efficient board size (between four and twelve members) had insignificant impact on acquirer value.

Huang and Kisgen (2013) analyzed whether male executives were overconfident relative to female executives. The short run performance (abnormal returns) upon announcements was estimated using a sample of 2,783 acquisitions, 111 debt issuances and 592 equity issuances over the period 1993-2005. Cumulative abnormal returns were estimated over the three-day (-1,1) event window either with raw return or market-adjusted return model. The results showed that male executives engaged more both in acquisitions and in issuance of debt, relative to female executives. They also indicated that investors reacted more favorably to corporate financial decision announcements of firms with female executives. Specifically, the results derived from cross-sectional analysis for the announcement returns, indicated that female executives in post- executive transition period had significantly positive impact on CARs upon both acquisition announcements and debt issuance announcements. Size was significantly negatively associated with CARs for acquirers, whereas market-to-book ratio was significantly positively associated with CARs upon both acquisition announcements and equity issuance announcements. For acquisition announcements, acquisitions of public targets negatively affected the CARs whereas tender deals positively affected the CARs. Moreover, for the sample of equity issuance announcements, both cash flow and share turnover significantly negatively affected the announcement CARs. The authors argued that firms with male executive were more likely to experience value destruction upon acquisition announcements, compared to firms with female executives. They concluded that male executives presented higher levels of overconfidence towards corporate decision making relative to female executives.

Yim, (2013) investigated the impact of CEOs' age on the acquisition behavior by emphasizing the agency problems in the market for corporate control. The dataset was consisted of 7,999 acquisitions of 29,219 observations over the period 1992-2007. The M&A dataset contained U.S. acquirers and both U.S. and non-U.S. targets. Announcement returns were estimated using the event-study methodology and specifically with the three-day (-1, 1) event window surrounding the M&A announcements. Given that acquisitions were accompanied by increases in CEOs' compensation, there were incentives that pursue CEOs to engage in M&A activity in earlier stages of their career. In this context, the results indicated that acquirers with CEOs who were 20 years older were less likely (by about 30%) to involve in merger activity. Therefore, there was a negative impact of CEOs' age on M&A activity, which was more pronounced for acquirers with CEOs who were likely to anticipate or

to influence post-merger compensations. The results derived from cross-sectional analysis for the acquirer three-day CAR indicated that young CEOs had insignificant impact on acquirer CARs; however, young CEOs who anticipate greater compensation benefits pursued more and worse quality M&As.

Croci and Petmezas (2015) analyzed the CEOs' risk-taking incentives in the context of acquisitions. The sample contained 9,003 completed acquisitions announced by 2,056 U.S. firms over the period 1997-2011. Excess abnormal returns were calculated using the buy-and-hold abnormal returns (BHARs) using the 25 Fama-French value-weighted portfolios (based on size and book-to-market portfolios) as benchmark. The five-day (-2,2) CARs using the market model with the CRSP value-weighted index as market benchmark were also used to estimate the impact of CEOs' risk-taking incentives on excess returns. Risk-taking incentives were measured by vega (change in CEO wealth for one percentage change in the annualized standard deviation of stock returns) and delta (change in CEO wealth for one percentage point change in stock price). The results showed a positive relationship between CEO's vega and acquisition investments for only the non-overconfident CEOs and which was not affected by corporate governance. CEOs' vega was significantly positively associated with five-day (-2,2) acquirer announcement returns.

Pham et al. (2015) investigated the impact of CEO duality on M&As in the emerging market of Vietnam. CEO duality exists when the CEO simultaneously holds the role of chairman of the board of directors (BoDs). The sample contained 188 M&As in Vietnam over the period 2004-2013. The event study methodology was used to evaluate the market responses of M&A announcements. Cumulative abnormal returns were estimated using the market model. In the three-day event window (-1,1), CARs for the duality sub-sample were significantly higher by about 1.185%, relative to the non-duality sub-sample. Using multivariate analysis, they found that CEO duality significantly positively affected the three-day acquirer abnormal returns. Board size, selection of big auditors, percentage of nonexecutive directors on BoDs, percentage of CEO equity ownership, CEO gender, and CEO business-related degree had not explanatory power on CARs, whereas the percentage of equity ownership of bidder firm held by its directors (insiders) was significantly positively associated with acquirer CARs. Moreover, the OLS regression analysis for the long run performance showed that CEO duality significantly positively affected the changes both in EPS growth and in ROA. However, for the EPS growth the instrumental variable (IV) approach did not confirm the OLS results. Overall, they documented that CEO duality positively affected the acquirer's shareholder wealth and could improve the acquirer's long-run performance.

Elnahas and Kim (2017) evaluated the impact of CEO's political ideology on M&A decisions. The dataset covered 1,007 U.S. listed firms and contained 4,623 deals for which the short-run performance was estimated over the period 1993-2006. To

capture the short-run effects of M&As, cumulative abnormal returns were estimated over the three-day event window (-1,1) using the market adjusted model with the CRSP value-weighted index as market benchmark. In the long-run, the buy-and-hold abnormal returns (BHARs) were estimated using matched firms based on size and book-to-market value of equity portfolios for the returns of the matched firms. BHARs calculated over a period that varied from one year to five years after the merger announcements. The results indicated that republican CEOs, namely CEOs with conservative characteristics, were less likely to engage in acquisition activities. Furthermore, republican CEOs who engaged in M&A activity were associated with the selection of cash as method of payment as well as with the selection of listed targets. However, they avoided both the industry diversification and the existence of high information asymmetry towards M&As. They argued that CEO political orientation was associated with long-run value following the M&As; however, short-run performance was not affected by CEOs' political ideology. The results derived from cross-sectional analysis for the announcement three-day CARs showed that republican CEOs were not significantly associated with the value creation. CEOs tenure, the selection of listed targets, the relative value, the acquirer size and the industry competition were significantly negatively associated with acquirer announcement CARs. On the other hand, founder dummy, tender offers and Tobin's Q were significantly associated with the acquirer CARs. BHARs were negative for 1 to 5 years after the announcement. Moreover, BHARs for mergers announced by republican CEOs were significantly higher (over the 1, 2, 4 and 5-year period after the announcement), relative to merges announced by non-republican CEOs. The cross-sectional analysis for the long-run performance indicated that Republican CEOs were significantly positively associated with BHARs. With respect to the other determinants, CEO age and relative size were significantly positively associated with BHARs, whereas CEO tenure was significantly negatively associated with BHARs.

Dahya et al. (2019) analyzed the association among governance mandates, outside directors and acquirer performance. The dataset contained 2,292 deals announced by U.K. firms over the sub-periods 1989-1996 and 2000-2007 (the selected sub-periods were centered for the Cadbury Report in 1992 and the Higgs Report in 2003, respectively). Moreover, they used hand-collected data towards the board structure mandates. Acquirer returns were calculated using the event-study methodology. Specifically, the market-adjusted model with the FTSE All-Share index as market benchmark was used for the estimation of the three-day (-1,1) CARs surrounding the deal announcements. The results showed that increases in the fraction of outside directors were associated with increases in acquirer returns only in case of the acquisition of public targets. They argued that the greater outside director reputational exposure in case of high publicity explained the positive relationship between the fraction of outside directors and acquirer returns in the acquisition of public targets.

Plaksina et al. (2019) evaluated the impact of CEO's social status on the M&A decision making. The dataset with full stock-price data was consisted of 1,612 U.S. deals over the period 1992-2012. CEOs' ascribed social status was measured through the existence of prestigious education, whereas the achieved social status was measured through the receiving awards. CEO acquisitiveness was measured using the frequency and the value of the merger activity. The market response to M&A announcements was assessed using the event study methodology. Cumulative abnormal returns over the three-day event window (-1, 1) were estimated with the market model using the CRSP equal-weighted index as market benchmark. The results for the relationship between CEO status and M&A activity showed that both types of social status were associated with reduced activity of M&As and this result was considerably strong for CEOs' who simultaneously had the both types of social status. The results derived from the event-study showed that for the full sample CARs in the three-day window (-1, 1) were insignificant. On the contrary, CARs for cash (stock) deals were statistically significant and positive (negative) and equal to 0.8% (-0.5%). For the whole sample, acquirers with CEOs with lower social status were associated with positive abnormal returns, whereas acquirers with higher achieved social status experienced significantly negative abnormal returns. Results from cross-sectional analysis showed that the negative announcement effect was stronger when deals were completed within one year from the time that CEOs received awards. Moreover, CEOs' high ascribed status was not significantly associated with the acquirer value. With respect to the impact of the control variables, firm size, relative deal size, equity financing and tender offers were significantly negatively associated with acquirer announcement CARs. In contrast, cash financing, relatedness and hostiles were significantly positively associated with acquirer CARs. They concluded that although ascribed status had insignificant impact on acquirer returns, possessing high achieved status was significantly negatively associated with announcement abnormal returns.

Zhou et al. (2020) analyzed the effect of CEO's tenure on M&As. To estimate the short-run valuation effects, the dataset contained 7,823 M&As announced in the U.S.A. over the period 1999-2015. The event study methodology was used and cumulative abnormal returns were estimated over the five-day event window (-2,2) using the market model. Mean acquirer CAR in the (-2,2) window equal to 0.8% for the whole sample in the entire period. The results of the cross-sectional analysis showed that CEO tenure dummy was significantly positively associated with the acquirers' CARs. CEO's age, board size, CEO's pay slice and independent board ratio were insignificantly associated with acquirer CARs. With respect to the other determinants, firm size, target public status and pure stock dummy were significantly negatively associated with acquirer CARs. On the contrary, market to book ratio, related acquisitions and domestic target deals were significantly positively associated with acquirer CARs. Hence, the results indicated that M&As from acquirers whose CEOs had long tenure were associated with higher shareholder wealth compared to

deals announced by firms with short-tenure CEOs. The results further indicated that long-tenured CEOs were more likely to engage in acquisitions of private targets, in industry related deals and in domestic deals. In contrast, CEOs with higher age were significantly less likely to engage in acquisition of private targets or in industry related acquisitions. They also argued that, in case of value-creating M&As, long-tenured CEOs received higher compensation, relative to the compensation that they received in the pre-acquisition period.

Defrancq et al (2021) investigated the impact of acquirer boards on value creation from M&As using a sample of 2,230 deals made by listed companies in Continental Europe over the period 2007-2013. The event study methodology was used to capture the value implications of M&As for the acquiring firms. Cumulative abnormal returns were estimated with the market model using the MSCI Europe index as market benchmark over the three-day event window (-1,1) surrounding the event announcement. The eleven day (-5, 5) window and the forty-one day (-35, 5) window were also used. According to the results, M&As were associated with significant and positive three-day acquirer average CARs that equal to 0.82%. Median CARs were also significant and positive (0.43%) over the three-day window. Domestic deals were associated with significantly higher CARs in the (-5,5) window, relative to cross-border deals. The results derived from the cross-sectional analysis indicated that boardroom gender diversity marginally positively affected the acquirer CARs. Furthermore, the results showed that age diversity was positively associated with acquirer's CARs both for domestic transactions and for industry-related deals. National diversity was negatively associated with acquirer's CARs for domestic transactions. Board size was insignificant associated with acquirer shareholder wealth. The fraction of independent directors was positively associated with acquirer CARs, whereas CEO duality was negatively associated with acquirer's CARs only in industry diversifying deals that initiated by firms that were not controlled by an individual of a family shareholder. However, the negative effect of CEO duality on acquirer CAR was mitigated in case of strong rule of low in the acquirer country.

Ding et al. (2021) evaluated the effect of CEO's country-specific experience on cross-border deals. The sample was consisted of 3,696 cross-border acquisitions announced by 1,215 U.S. acquirers over the period 2002-2013. To assess the impact of CEO experience on acquirer performance, cumulative abnormal returns with the Fama-French three-factor model and abnormal ROA were estimated. For the whole sample, three-day CAR equal to 0.28%. The results showed that the likelihood of acquisitions was higher in case CEOs had prior experience in the target country. Moreover, they found that CEO's experience provided reassurance for deals in risky environments. Although CEO's country-specific experience was not associated with acquirer short-run or long-run performance, it affected value creation only in risky environments. For M&As that announced by acquirers with good corporate governance, CEO's experience was positively associated with value creation.

Tampakoudis et al. (2021) evaluated the impact of Environmental, Social, and Governance (ESG) on the acquirer performance before and during the pandemic. The sample contained 889 M&As in the U.S.A. over the period 2018-2020. The short-run performance was estimated using the market model using the S&P 500, the NASDAQ Composite, and the NYSE Composite as alternative proxies for the market portfolio. CARs were estimated across various event windows. The results showed that acquirers with high (low or medium) pre-acquisition ESG scores presented significantly negative (positive) CARs that equal to -0.80% (0.96%) in the three-day (-1,+1) event window. Therefore, acquirers with high ESG scores presented significantly lower CARs (by about -1.76) relative to the CARs from acquirers with low or mediums ESG levels. The results derived from multivariate analysis showed that acquirer ESG scores had significantly negative impact on the acquirer returns. This negative association was stronger during the COVID-19 pandemic period.

Table 3 presents the summarized results derived from the literature review with respect to the impact of corporate governance characteristics on the performance of corporate Mergers and Acquisitions (M&As).

Table 3. Empirical results for the effect of corporate governance characteristics on shareholder wealth upon corporate M&As

Year	Authors	Research Aim	Events	Sample Period	Country	Event-study methodology	Results
2007	Masulis et al.	Evaluation of the role of corporate governance mechanisms on value creation from M&As	3,333 M&As	1990-2003	U.S.A.	Market adjusted model with the CRSP equal-weighted index as market benchmark	Five-day (-2,+2) CARs were statistically significant and equal to 0.215%. Antitakeover provisions were negatively associated acquirer CARs. Acquirers with separating position between CEO and Chairman or acquirers operating in competitive industries experienced significantly higher CARs.
2008	Malmendier and Tate	Investigation of the relationship between CEO overconfidence and M&As	808 M&As	1980-1994	U.S.A.	Market adjusted model using the S&P500 index as benchmark	Overconfident CEOs were associated with value-destroying deals. Three-day (-1, +1) acquirer's CARs were significantly negative and equal to -0.29%.
2013	Huang and Kisgen	Examination of the impact of executives' gender and overconfidence on corporate decision making	2,783 M&As, 111 debt issuances and 592 equity issuances	1993-2005	U.S.A.	Raw returns and market-adjusted return model	Male executives engaged more both in acquisitions and in issuance of debt, relative to female executives. Investors reacted more favorably to corporate financial decision announcements of firms with female executives. Male executives presented higher levels of overconfidence towards corporate decisions.
2013	Yim	Evaluation of the relationship between young CEOs and M&As	7,999 M&As	1992-2007	U.S.A.	Three-day (-1, +1) event window surrounding the deal announcements	There was a negative impact of CEO age on M&A activity. Acquirers with CEOs who were 20 years older were less likely (by about 30%) to involve in M&As.
2015	Croci and Petmezas	Evaluation of the effect of overconfident CEO's on shareholder wealth	9,003 M&As	1997-2011	U.S.A.	Market model with the CRSP value-weighted index and BHARs using the 25 Fama-French value-weighted portfolios	Positive relationship between CEO's vega and acquisition investments which was confirmed only in case of non-overconfident CEOs. CEOs' vega was significantly positively associated with five-day (-2,+2) CARs.
2017	Elnahas and Kim	Investigation of the impact of CEO political ideology on M&As	4,626 M&As	1993-2006	U.S.A.	Market adjusted model with the CRSP value-weighted index. BHARs using matched firms based on size and book-to-market value of equity portfolios	Republican CEOs were less likely to engage in M&As. They selected both cash deals and acquisitions of listed targets, but they avoided industry diversification and high information asymmetry towards M&As. Republican CEOs were significantly positively (insignificantly) associated with BHARs (CARs).
2019	Dahya et al.	Examination of the association among governance mandates, outside directors and performance	2,292 M&As	1989-1996 and 2000-2007	U.K.	Market-adjusted model with the FTSE All-Share index as market benchmark	Increases in the fraction of outside directors were associated with increases in acquirer returns only in case of the acquisition of public targets.
2019	Plaksina et al.	Evaluation of the impact of CEO social status on M&As	1,612 M&As	1992-2012	U.S.A.	Market model using the CRSP equal-weighted index as market benchmark	Social status was associated with reduced activity of M&As. Three-day (-1, +1) CARs for cash (stock) deals were statistically significant and positive (negative) and equal to 0.8% (-0.5%). Possessing high achieved status was significantly negatively associated with announcement CARs.
2020	Zhou et al.	Investigation of the effect of CEOs tenure on M&As	7,823 M&As	1999-2015	U.S.A.	Market model	Five-day (-2, +2) CARs equal to 0.8%. CEO tenure was significantly positively associated with acquirer CARs. Long-tenured CEOs were more likely to engage in acquisitions of private targets, in industry related deals, and in domestic deals.
2021	Defrancq et al.	Evaluation of the impact of acquirer boards on value creation from M&As	2,230 M&As	2007-2013	Continental Europe	Market model using the MSCI Europe index as market benchmark	Three-day acquirer CAR was significant (+ 0.82%). Boardroom gender diversity marginally positively affected the acquirer CARs. Age diversity was positively associated with acquirer's CARs both for domestic and for industry-related deals.
2021	Tampakoudis et al.	Evaluation of the impact of ESG on acquirer CARs	889 M&As	2018 - 2020	U.S.A.	Market model using the S&P500, the NASDAQ Composite or the NYSE Composite as benchmarks	Acquirers with high ESG performance presented significantly lower (by about -1.76%) CARs compared to the acquirers with low or medium ESG performance. Negative impact of ESG on acquirer's CARs over the entire period; However, this association was stronger during the COVID-19 pandemic.

2.5. Mergers and Acquisitions (M&As) in the banking sector

Technology and regulation changes affect the consolidation in the banking sector. Banks are motivated to improve their efficiency, to attract new customers, to enhance their revenues, to geographically expand their activity and to expand the offered products and services. In this context, M&A activity in the financial sector, among others, is a way that can be used by banks to enlarge their size, to achieve efficiency gains, to obtain knowledge and to diverse the investment portfolios (Amel et al., 2004). Commercial banks can be separated into two distinct product markets which are the retail banking and the wholesale banking. The former is oriented towards households and small firms whereas the latter is oriented towards larger firms and financial institutions. In any case there are many banks that offer both retail and wholesale services (Amel et al., 2004). However, banks provide nowadays a complete portfolio of financial services. Saunders et al. (2020) state that since the 1980s banks have moved away from the core baking and interest generating activities and therefore expand their activities to non-interest generating activities (such as activities that are associated with fees, trading profits etc). Furthermore, the elaborating of bank business model with non-interest activities is associated with higher bank performance (Saunders et al., 2020).

Mergers in the banking sector contribute to efficiency gains due to cost reductions. Specifically, merging financial institutions reorganize their branch networks, reduce the back-office operations, reorganize the common-offered services, benefit from brand recognition, and reduce the cost of information technology usage. As a result of the above consequences, merging banks reduce their operating costs and therefore achieve economies of scale (Campa and Hernando, 2006). In this context, large banks derived from mergers can obtain access to cost-saving technologies which in turn lead to economies of scope and scale (Amel et al., 2004).

Furthermore, merging organizations strengthen their market positioning in the overall market (i.e. increased market power), increase the sales of financial products as well as they can generate value from the market implications derived from such the announcements (Campa and Hernando, 2006). According to Berger et al. (1999), consolidation in the banking industry is motivated by improvements in financial conditions, improvements in the technology context, excess capacity or financial distress, consolidation of international financial markets and deregulation of regional (geographical) or product restrictions. The main consequences of consolidation include improvements in the levels of firm efficiency as well as increase in market power. In addition, the consolidation in the banking industry can improve the payments system as well as the soundness of the banking system (Berger et al., 1999).

Merger activity in the banking sector can also be motivated by incentives of value-maximization. In essence, mergers are designed in order to increase the market

concentration which leads to increase in the market power in setting prices (Berger et al., 1999). Furthermore, prior empirical studies indicate that merger activity can contribute to the achievement of efficiency gains (Berger et al., 1999). However, Amel et al., (2004), who reviewed several studies, suggest that there is little evidence that mergers in the financial sector yield efficiency gains or economies of scope. DeYoung et al. (2009), who also reviewed more than 150 studies for M&As in the banking sector, concluded that North American mergers improve (or can improve) the banking efficiency despite that event-studies indicate mixed results regarding shareholder wealth creation.

Regarding the gains of M&A activity, Al-Khasawneh et al. (2020) analyzed the total productivity and the cost efficiency of U.S. acquiring banks during the fifth merger wave (1992-2003) and they concluded that the productivity scores of large merging banks were similar to those of their peers whereas the productivity scores of small merging banks were lower than those of their peer banks. However, they found that both small and large merging banks presented higher cost efficiency scores compared to their peers over the firth merger wave.

Another reason for mergers in the banking industry is that through consolidation banks can receive the government's safety. Namely, very large bank entities, the so called "too big to fail" banks or "systemically important financial institutions" receive specific government protection and thus there is an incentive for merger activity in banks in order to enhance the protection of their debtholders or shareholders. Bank mergers can also be motivated by managerial incentives. Managers that participate in the formulation of a deal may enhance their skills and their rewards. CEOs with pay that is based on the bank performance may affect the bank's acquisition activity. Moreover, regulatory authorities can affect the acquisition activity through the legislation framework and the bank regulation. For example, regulators can prevent in-market bank mergers when the rises in bank concentration results to excessive increase in the level of market power. In contrast, deregulation through the relaxation of restrictions (e.g in interstate and intrastate banking) can also force the merger activity. According to DeYoung et al. (2009), financial deregulation was necessary for financial institutions so as to be fully benefited from new and innovative production processes. However, Ghosh and Petrova (2013) argued that in post-deregulation period (after the Financial Services Modernization Act of 1999), banks with more restrictive antitakeover provisions realized lower abnormal returns upon acquisition announcements.

According to Caiazza et al. (2012), who used a sample of 24,352 banks from more than 100 countries over the period 1992-2006 and a sample of 1,484 bank mergers, the probability for a bank to be target in cross-border mergers was lower than to be target in domestic mergers. Furthermore, target banks which involved in mergers had lower than average efficiency which implies that acquirers select targets and tend to

restructure them in order to improve targets' efficiency and profitability. The "acquire to restructure" hypothesis was supported more in case of domestic deals as well as in case of cross-border deals within G10 countries. Moreover, the propensity of banks to be targets was significantly higher for large banks whereas the impact of bank size on the probability to be target in bank mergers was not significantly different between domestic and cross-border mergers in the banking sector (Caiazza et al., 2012).

Apart from the above results of mergers in the banking sector, an indicator of efficiency gains for merging banks is the stock market performance. Event studies are used in order to evaluate the prices surrounding the merger announcements, the market reaction as well as the shareholder value. Bidder shareholder value, target shareholder value and combined bank shareholder value are commonly estimated for the evaluation of bank mergers (Amel et al., 2004). In this context, event studies capture the abnormal returns upon merger announcements and indicate the market perception of the value creation or the value destruction by mergers (DeYoung et al., 2009). Prior studies indicated that the merger activity was affected by the deregulation in the U.S. banking sector. During financial crises, regulatory authorities and governments may encourage the merger activity in the banking sector (Berger et al., 1999).

To analyze the consolidation in the U.S. banking sector, table 4 reports the number of U.S. banks over the period 1986-2020. Table 4 shows the dramatic decline in the number of U.S. commercial banks since 1986. Specifically, the number of commercial banks has declined by about 68.8% over the sample period. Indeed, from a peak of 14,027 commercial banks in 1986, by the end of 2020 the number of commercial banks in the U.S.A. has fallen to 4,377 banks.

The 1990s bank merger wave in the U.S.A. was partially motivated by technology changes and regulatory reforms (Al-Khasawneh et al., 2020). The elimination of interstate banking restrictions (e.g. through The Riegle-Neal act of 1994) created more competitive pressure among the U.S. banks[4]. To deal with the intensive industry competition, banks were urged to engage in M&A activities[5]. Indeed, the number of commercial banks equals to 10,421 institutions in 1994, whereas by the end of 1999 commercial banks have fallen to 8,452 institutions. According to Rhoades (2000), the passage of Riegle-Neal Act (1994) provided great opportunities for large bank mergers and gave incentives for immediate establishment of interstate banking franchise. However, despite that Riegel-Neal Act contributed to merger activity, the passage of Gramm-Leach-Bliley Act of 1999, which is related to cross-industry mergers between commercial banks and securities, investment banking and insurance

[4] The Interstate Banking and Branching Efficiency Act (IBBEA) also known as Riegle-Neal Act is signed by President Clinton in September 1994.
[5] Rhoades (2000) indicated that approximately 8,000 mergers took place in the U.S. banking sector during the period 1980-1999.

underwriters, was found unlikely to affect bank mergers as well as the U.S. banking structure (Rhoades, 2000).

Table 4. Commercial banks, bank branches and savings institutions in the U.S. over the period 1986-2020

Year	Commercial banks	Number of commercial bank branches	Savings Institutions	Year	Commercial banks	Number of commercial bank branches	Savings Institutions
1986	14,027	45,637	3,728	2004	7,570	73,479	1,349
1987	13,584	46,710	3,658	2005	7,467	76,096	1,309
1988	12,971	48,423	3,502	2006	7,402	78,839	1,284
1989	12,578	51,820	3,358	2007	7,288	81,182	1,255
1990	12,229	54,267	2,987	2008	7,086	85,205	1,232
1991	11,855	55,835	2,650	2009	6,828	85,566	1,183
1992	11,395	55,920	2,472	2010	6,532	84,876	1,139
1993	10,897	57,054	2,321	2011	6,279	85,309	1,084
1994	10,421	59,129	2,151	2012	6,087	84,898	1,015
1995	9,901	59,360	2,028	2013	5,851	83,861	966
1996	9,482	61,118	1,930	2014	5,609	82,820	903
1997	9,079	63,164	1,780	2015	5,348	81,945	845
1998	8,709	65,341	1,692	2016	5,115	80,411	801
1999	8,452	66,984	1,639	2017	4,918	79,073	754
2000	8,200	67,558	1,587	2018	4,717	77,723	691
2001	7,998	67,677	1,530	2019	4,523	77,022	659
2002	7,803	69,003	1,469	2020	4,377	74,935	627
2003	7,698	70,230	1,411				

Note: This table presents the number of commercial banks, the number of commercial bank branches as well as the number of savings institutions in the U.S. over the period 1986-2020. The data retrieved from the FDIC website and are available at: https://banks.data.fdic.gov/explore/historical?displayFields=STNAME%2CTOTAL%2CBRANCHES%2CNew_Char&selectedEndDate=2020&selectedReport=CBS&selectedStartDate=1934&selectedStates=0&sortField=YEAR&sortOrder=desc (assessed on 01/03/2022).

Deregulation also positively affects overall firm growth. Berger et al. (2020) suggested that relatively financially unconstrained firms can be benefited from geographic deregulation which in turn contributes to firm growth. On the contrary, relative constrained firms suffer from the reduced access to external financing and therefore lose from deregulation. In this context, bank consolidation has important implications for firms because it affects their levels of raised funds. Given that firms depend on credit from financial institutions in order to start, survive and growth, the deregulation and the consolidation in the banking sector affect the new business formation. Consolidated banks may achieve economies of scale and scope derived from synergy gains, risk diversification and loan portfolio optimization. Consequently, on one hand, consolidated banks may reduce their costs of providing funds and in case that these gains passed on to borrowers, the latter may be benefited from M&A activities. On the other hand, if banks enhance their monopoly power through M&As, they may use these advantages in order to impose unfavorable terms

to borrowers. In any case merger activities may affect borrowing firms (Francis et al., 2008).

2.6. Empirical Results for the wealth effects upon bank M&As

DeLong (2001) evaluated the impact of merger announcement on the shareholder wealth using a sample of 280 domestic U.S. mergers over the period 1988-1995, in which at least one banking company was involved. The market reaction upon merger announcement was assessed using the event study methodology. Abnormal returns were estimated with the market model, using the value-weighted market index, to evaluate the bidder's shareholder value. The combined value for two merging parties was also estimated to investigate the valuation effects of bank mergers. Cumulative abnormal returns are estimated for the twelve-day (-10, 1) event window. For the whole sample, average CARs were significantly negative for bidders (-4.71%) but significantly positive for targets (16.61%). Combined abnormal returns were not significantly different from zero. Activity focused mergers were associated with significantly higher bidder and combined abnormal returns relative to diversified deals, whereas target CAR was significantly positive both for activity focused and activity diversified (17.61%) bank mergers. Results from multivariate analysis indicated the significant and positive impact both of geographically focused and activity focused mergers on cumulative abnormal returns.

Cornett et al. (2003) investigated the shareholder value and the role of corporate governance mechanisms in U.S. bank acquisitions. Using a sample of 423 merger announcements by 177 acquirers over the period 1988-1995, they conducted an event-study analysis to estimate the announcement wealth effect. Cumulative abnormal returns over the windows (-1 ,0) and (-1, 1) were estimated using the market model. For the whole sample three-day CAR was significantly negative and equal to -2.41%. Furthermore, both interstate acquisitions and industry diversifying bank acquisitions were associated with significantly negative acquirer abnormal returns upon the announcement. Results of multivariate analysis supported that diversified acquisitions produce significantly lower abnormal returns. Furthermore, equity owned by CEO, options granted to CEO, and percent of outside directors were significantly positively associated with acquirer CARs. However, corporate governance factors that reducing the shareholder-manager conflict were less effective in diversified (geographically and by activity) mergers relative to non-diversified mergers.

DeLong, (2003) evaluated whether the announcement effects of U.S. bank M&As were similar to non-U.S. bank M.&As. The sample was consisted of 397 U.S. domestic and 41 non-U.S. deals over the period 1988-1999. The announcement effects of bank mergers were estimated using the event study methodology. Specifically, the cumulative abnormal returns were calculated with the market model using a value-weighted bank index as benchmark for the market portfolio. They

estimated the twelve-day event-window (-10, 1) to assess possible price effects prior to the merger announcement. Combined abnormal returns for the combined entity (bidder and target) were also calculated to capture whether bank merges were value-enhancing. For the whole sample, the results indicated statistically significant and negative acquirer CAR (-1.89%) but statistically significant and positive target CAR (14.76%). For U.S. domestic deals, acquirer's CARs were significant and equal to -2.10% whereas target CARs were also significant but equal to 15.39%. For non-U.S. deals, target CARs were significant and equal to 8.60%, acquirer's CARs were insignificant but combined CARs were significant (at 10%) and equal to 1.32%. The results of the differences between the groups showed that acquirer's CARs were significantly higher by 2.22% for non-US deals, but target CARs were significantly lower by -6.79% for non-U.S. deals. The results from the multivariate analysis indicated that non-U.S. domestic bank deals were positively associated with acquirer CARs, whereas pre-merger acquirer performance, relative market value and pooling accounting method were negatively associated with acquirer CARs. Furthermore, relative market value negative affected the target CARs, whereas correlation coefficient of partners' pre-merger returns positively affected the target CARs. Pre-merger performance of target was negatively associated with combined CARs, whereas relative market value was positively associated with combined CARs. They also indicated that CARs in countries with well-developed stock markets were not inherently different between the U.S. domestic and the non-U.S. bank mergers.

Campa and Hernando (2006) investigated the performance of M&A in the European financial industry. Using a sample of 244 mergers in the financial industry among public companies over the period 1998-2002, the results showed significantly positive abnormal returns for targets (3.24%) but significantly negative abnormal returns for bidders (-0.87%) upon the announcements. The results of the multivariate analysis for the three-day event window indicated that targets' excess returns upon announcements were significantly positively associated with the relative deal size. The long-run excess returns, one year after the announcements, were insignificantly different from zero both for bidders and targets. However, there was a significant improvement in targets' ROE two years after the deal completion.

Chong et al. (2006) evaluated the wealth effects of forced bank mergers in Malaysia using a sample of six core banks and ten non-core (target) banks over the period 1999-2000. Forced mergers were rare and constituted the result of the government intervention in the process of consolidation in the banking sector. Abnormal returns were estimated using the market model with the KLSE composite index as market benchmark. They found that forced mergers were associated with aggregate value destruction. As opposed to voluntary M&As, in case of forced mergers the acquiring banks tended to gain at the expense of the target banks.

Delong and Deyoung (2007) evaluated the information spillovers regarding the bank M&As in order to explain why empirical studies failed to support value creation. Using a sample of 216 bank mergers of large U.S. banks over the period 1987-1999, they hypothesized that both banks and investors learned by observing information from previous mergers. To assess the market reaction, the event-study methodology was used. Specifically, abnormal returns were estimated using the market model with the Datastream index for U.S. banks as market benchmark and the combined returns (a portfolio of acquiring and target banks) were also calculated. The twelve-day event window (-10, 1) was used as main event window to evaluate the market reaction upon bank mergers whereas other three event windows ((-5, 5), (-10, 10), and (-10, 5) were also applied. The results provided evidence for significant negative abnormal returns for acquiring banks (-2.39%) in the twelve-day window but significant positive abnormal returns for target banks (16.43%) in the twelve-day window. Abnormal returns for combined banks were insignificant over the alternative event-windows. Results for the post-merger performance, measured by the changes in ROA, ROE, interest margin, cost efficiency, core deposits to assets, and non-interest income, indicated that, for the full sample, both ROA and non-interest income significantly declined by about -0.05 and -0.12, respectively. However, by the split of mergers into two sub-samples with respect to the sample period, results showed that post-merger financial performance (measured by both ROA and ROE) for mergers that were announced in the second-half period was statistically significantly higher compared to the performance for mergers that were announced in the first-half period. Furthermore, the results of multivariate analysis indicated that banks learned by observing because there was a positive association between the number of observable bank mergers and the post-merger performance. Therefore, information spillovers improved the post-merger performance. Finally, they concluded that their findings were consistent with the semi-strong EMH.

Gupta and Misra (2007) evaluated the association between deal size, bid premiums and gains in the context of bank mergers. The dataset contained 503 deals by U.S. banks over the period 1981-2004. To assess the gains of bank M&As the event-study methodology was used to calculate cumulative abnormal returns over the three-day (-1,1) event window. Abnormal returns were estimated for bidder, targets and the combined firms using the market model with the CRSP equally weighted index as market benchmark. For the whole sample, acquirer's CARs were statistically significant and negative (-1.84%), target CARs were statistically significant and positive (16.12%), whereas CARs for the combined firms were statistically significant and positive (0.29%). For the whole sample, the results of the cross-sectional analysis indicated that relative bid was significantly positively associated with combined CARs, whereas the selection of stock exchange transactions was significantly negatively associated with combined CARs. For the sub-sample of only value enhancing deals, acquirer's CARs were significantly negatively affected by the relative bid and the stock payment but they were significantly positively affected by

the pre-Riegle dummy. Target CARs for the value enhancing deals were significantly positively affected by the relative bid, the post-Riegle dummy and the post-Gramm dummy. They concluded that the impact of deal characteristics on shareholder wealth differed between the value-enhancing and the value destroying deals.

Hagendorff et al. (2008) evaluated the association between investor protection and acquirer announcement wealth effects upon bank mergers. The sample was consisted of 204 completed bank mergers announced in the Europe (EU-15 countries plus Switzerland) and the U.S.A. during the period 1996-2004. Acquirer abnormal returns were estimated using the event-study methodology using the market model with the Datastream national bank-sector indices as market benchmarks. The statistical significance of abnormal returns was assessed using the BMP-test (Boehmer et al., 1991) and the Corrado-test (Corrado, 1989). The levels of investor protection for target countries were measured using indices that developed by La Porta et al (1998). For the whole sample of 204 bank mergers in the EU and the U.S.A., the results provided evidence that the three-day (-1, 1) CAR was significantly negative and equal to -0.50% whereas the five-day (-2,2) CAR was significantly negative and equal to -0.32%. Splitting the sample into EU and U.S. bank mergers, acquirers in the EU were associated with significant value creation that in the three-day window was significant and equal to +0.09%, while acquirers in the U.S.A. were associated with value-destruction that in the three-day window was significant and equal to -0.70%. Further, the results suggested that EU acquirers were associated with significant higher abnormal returns (by about 0.80% in the three-day window) relative to the U.S. acquirers. The results derived from the multivariate analysis indicated that shareholder protection in the target country was significant negatively associated with the acquirer abnormal returns (over the five-day window) upon merger announcements. Therefore, acquirer shareholders received higher abnormal returns when targets operated in low protection economies (European economies) relative to targets that operated in countries with high investor protection (U.S.A.).

Becher (2009) investigated the acquirer returns for the period around the passage of the interstate deregulation (Riegle Neal act) on 1994. The dataset was consisted of 65 bidders and 114 subsequent target firms. The event-study methodology was used to assess the valuation effects. In particular, to capture the wealth effects around the passage of Riegle Neal Act, the event window 01/02/1994 – 13/09/1994 was used. The valuation effect upon the mergers was estimated in the window (-30,+ 5). They found that 619 banks earned significant CARs that equal to 17.3% around the passage period (155 days) whereas 65 bidders earned significant CARs that equal to 26.31% around the same period. Therefore, the results showed that bidders who engaged in M&As after the passage of Riegle Neal Act received statistically significant and positive returns around the passage of the legislation, whereas these returns were significantly higher than the returns that were received by bidders upon the deal announcements. The authors found that announcement abnormal returns were, albeit

negative, insignificant different from zero and therefore bidders realized returns only upon the deregulatory event.

Hagendorff and Vallascas (2011) using a sample of 172 U.S. bank mergers over the period 1993-2007 investigated the association between CEO pay incentives and risk-taking. Default risk of acquirer bank was measured by the Merton distance to default (DD) model and the industry-adjusted change in DD was used as proxy for risk-taking. CEO pay incentives were assessed using the vega (incentives to increase risk) and the delta (incentives for increase share prices) measurements. Using the event study methodology, average cumulative abnormal returns for the twelve-day event window (-10, 1) equal to -0.94% and were estimated in order to control for the association between risk and shareholder gains. The results indicated that vega (delta) significantly negatively (positively) affected the default risk effects of M&As. Cumulative abnormal returns had negative and in some models significant impact on the acquirer default risk effects. In general, the results suggested that CEOs with higher levels of pay-risk sensitivity engaged in bank mergers which increased the levels of risk.

Hankir et al. (2011) evaluated the market reaction to bank M&A both announcements and completions or withdrawals in the North America and the Europe. The dataset contained 600 mergers that were announced over the period 1990-2008. To evaluate the wealth effects the event study methodology was applied using the index model, the constant mean return model and the CAPM. In the seven-day (-3,+3) event window the results showed that announcement CARs were statistically significant and equal to -0.885% for all acquirers and to 15.72% for all targets. North America acquirers (targets) presented CARs that equal to -1.185 (+18.028). European acquirers presented insignificant announcement CARs, whereas North-America targets presented significant CARs that equal to 8.796%. With respect to the pattern of seven-days CARs, the results indicated that the most frequent pattern was the market power hypothesis (10.8%) followed among others by the financial distress pattern (5.5%), the pre-emptive merger pattern (4.8%), and the synergy pattern (4.2%).

Goddard et al. (2012) evaluated bank M&As in emerging markets of both Asia and Latin America. The sample contained 132 deal announcements over the period 1998-2009. The event study methodology was used to assess the shareholder value upon bank M&As by modeling abnormal returns as regression coefficients on dummy variables. Both the six-day event window (-5,0) and the eleven-day window (-5,5) were selected to analyze the valuation effects. The results for the eleven-day (-5,5) window showed that for the whole sample acquirers experienced insignificant gains whereas targets earned significant positive CARs that equal to 1.596%. Therefore, they concluded that M&As created value for target firms and that acquirers did not lose value. Results derived from the cross-sectional analysis for the (-5,0) window indicated that acquirers that engaged in geographically diversified deals were

associated with value creation, while they were also benefited from the acquisition of underperforming targets, from the selection of share offer as mean of payment and from government-instigated deals. In the eleven-day window, cross-sectional analysis showed that both geographic focused deals and acquirers' merger experience were significantly negatively associated with acquirer value.

Hagendorff and Keasey (2012) analyzed the impact of acquirer board diversity on bank mergers and acquisitions. The sample was consisted of 148 bank mergers in the U.S. commercial bank sector over the period 1996-2004. The wealth effects upon merger announcements were estimated using the event-study methodology. Cumulative abnormal returns for the five-day window (-2, 2) centered on announcement day were calculated using the market model with the Datastream U.S. bank index as market benchmark. According to the results, merger announcements were associated with significantly negative CAR that equal to -0.47% in the five-day (-2, 2) window and to -0.70% in the three-day (-1, 1) window. Furthermore, the results derived from regression analysis indicated that diversification of board members towards their occupational background was positively associated with announcement abnormal returns. On the contrary, board diversity towards age and tenure was associated with losses in wealth effects. Board gender diversity had insignificant impact on the wealth effects on merger announcements.

Beltratti and Paladino (2013) analyzed whether the performance of bank M&As was different during periods of crisis. In particular, they evaluated the acquirer wealth effects upon both M&A announcements and M&A completions. The dataset was consisted of 139 acquisitions that were announced by bidders located in EU, Switzerland, and Norway over the period 2007-2010. The event-study methodology was used to estimate the market reaction upon M&A announcements and completions using the Eurostoxx bank index as benchmark for the market portfolio. Across the three-day event-window (-1, 1) there were insignificant CARs both upon the announcements and upon the completions of M&As. Using alternative event windows the results were different. In particular, for the six-day event window starting at the announcement or the completion date (0, 5), the results indicated that announcement CARs were insignificantly different from zero whereas completion CARs equal to 0.73% and were statistically significant at the 5% level. Results derived from the multivariate analysis showed that the ROE, equity to assets, friendly deals, national-focused deals and the transparency level of targets were significantly positively associated with the announcement three-day CARs (-1,1), whereas cash deals were significantly negatively associated with the announcement CARs. Overall, the results suggested the existence of insignificant CARs around the announcement of M&As but the existence of significant and positive CARs around the completions of bank acquisitions.

Ghosh and Petrova (2013) evaluated the association between the propensity of engaging in value-reducing acquisitions and corporate governance structures with respect the impact of deregulations due to the Interstate Banking Branching Efficiency Act (IBBEA) on 1994 and the Financial Service Modernization Act (FSMA) on 1999. Using a sample of 936 acquisitions in the U.S. banking sector over the period 1991-2011, they estimated cumulative abnormal returns upon deal announcements using the market model with the CRSP value-weighted index as market benchmark. Specifically, they estimated the three-day (-1, 1) and the five-day (-2, 2) event windows whereas the statistical significance of CARs was assessed using both the Pattel Z-test and the generalized sign-Z test. The results indicated that in the pre-IBBEA period cumulative abnormal returns were insignificant different from zero. In contrast, in the post-IBBEA (and pre-FSMA) period cumulative abnormal return was significantly negative and in the three-day window equal to -0.76%. Significant value-reduction upon acquisition announcements was also presented in the post-FSMA period. Specifically, the three-day CAR equal to -0.26% in the post-FSMA period. Results derived from multivariate analysis provided evidence that, in the post FSMA period, the probability of engaging in value destroying deals was significantly associated with the governance indices and measures. In the post-FSMA period, abnormal returns upon acquisition announcements in the five-day (-2, 2) window were significantly negatively affected by the governance index that captured the anti-takeover provisions.

Filson and Olfati (2014) analyzed the effects of Gramm-Leach-Bliley Act (GLBA) on bank holding companies (BHCs) acquisitions over the period 2001-2011. In particular, they estimated the impact of GLBA both on the risk and on the value of acquisition firms. The sample was consisted of 168 BHC acquisitions in the U.S.A. over the period 2001-2011. To measure the valuation effects for each firm involving in M&A, the four-factor model was used to estimate the abnormal returns. Moreover, the combined cumulative abnormal returns were estimated over several event windows surrounding the deal announcement date. The results for the whole sample showed positive and statistically significant combined CARs that equal to 0.013 in the three-day (-1,1) event window. Moreover, M&As with increased GLBA diversification presented significantly higher combined CARs compared to M&As with decreased GLBA diversification.

Leledakis and Pyrgiotakis (2019) evaluated the effect of Dodd-Frank Act (DFA) on the value creation upon bank mergers and acquisitions. The dataset contained 670 bank merger announcements in the U.S.A. during the period 1990-2014. Using the market model with the value-weighted market index as benchmark, they estimated the three-day cumulative abnormal returns upon merger announcements as well as the combined cumulative abnormal returns. The results of univariate analysis indicated the existence of significantly negative abnormal returns for acquiring banks over the examined period (-1.66%). The combined cumulative abnormal returns were

significantly positive over the whole period (0.90%). Moreover, targets' cumulative abnormal returns were significantly higher after the DFA (by about 9.35%) and the combined cumulative abnormal returns were significantly higher after the DFA (by 1.63%), compared to pre-DFA period. With respect to the combined firm size, the results showed that bidder, target, and combined CARs for small deals were significantly higher in the post-DFA period. According to the results derived from the multivariate analysis, the passage of DFA significantly affected the target cumulative abnormal returns which were by about 10.3% higher in the post DFA period. Furthermore, the cross-sectional analysis supported that DFA had a significantly positive impact on both bidder and target cumulative abnormal returns upon small deal announcements. By estimating the long-run returns, the results showed that this positive impact of DFA for small deals did not disappear over time.

Tampakoudis et al. (2019) evaluated the wealth effects of bank M&As in Greece considering the effects of the recent financial crisis. The dataset was consisted of 51 bank M&As (when acquirer bank took control of the target firm) and 28 bank transactions over the period 1997-2018. To estimate the valuation effects, the event study methodology was used. CARs were measured using the market model with the ASE General Index as benchmark upon both the M&A announcements and the M&A completions over alternative event-windows. For robustness, the Carhart four-factor model was also performed. The results indicated that the financial crisis had a neutral effect on the acquirer announcement returns. However, acquirer CAR was significantly negative upon the completions of M&As. According to the cross-sectional analysis, acquirer AGE, acquirer liquidity, domestic deals and horizontal deals had positive impact on announcement CARs, whereas acquirer market-to-book and risk had negative impact on the acquirer announcement returns.

Montgomery and Takahashi (2020) evaluated whether bank merger announcements constituted good news for client firms. The dataset was consisted of 46 bank mergers (from which the four are mega-mergers) in Japan over the period 1990-2012 and of 4,450 client firms. The wealth effects of client firms were estimated using the market-adjusted model with the TOPIX weighted index as benchmark for the market portfolio. The results for the (-3, 3) event window showed that clients of merged banks earned significantly positive CARs that equal to (0.003). With respect to the merger size, clients upon regular mergers earned significantly positive CARs (0.007), whereas clients upon mega-mergers were associated with significantly negative CARs (-0.003). They overall argued that bank merger announcements were associated with increases in the wealth of client companies; however, client firms did not associated with increases in wealth upon the announcements of bank mega-mergers, whereas client firms presented wealth loses upon bank mergers that were announced by undercapitalized banks.

Leledakis et al. (2021) examined the acquirer abnormal returns upon bank mergers in the U.S.A. during the period 1984-2015. The sample contained 2008 merger announcements from which the 790 were referred to the acquisition of public targets and the rest to the acquisition of private targets. Cumulative abnormal returns were estimated for the five-day event window (-2, 2) using the market-adjusted model with the CRSP value-weighted index as market benchmark. The statistical significance of CAR was assessed using the test of Boehmer et al. (1991). For the whole sample, the results indicated that bank merger announcements were associated with significantly negative abnormal returns (-0.22%). By splitting the sample between acquisition of public and private targets, the results showed that the acquisition of public targets was associated with significant negative CAR (-1.45%), but the acquisition of private target was associated with significant positive CAR (0.57%). Acquisition of private targets was associated with significantly higher CAR (by about 2.02%) relative to the acquisition of listed target. The results of multivariate analysis further supported that acquisition of private targets was positively associated with acquirer CAR. Acquirers of public (private) targets when they used financial advisors experienced significantly lower (higher) abnormal returns and this result was explained by the differences in the levels of information asymmetry between private and public targets. However, the top-tier advisor variable had insignificant impact on acquirer CAR and thus the reputation of the advisors was not associated with the shareholder value.

Tampakoudis et al. (2022a) analyzed the acquirer announcement returns upon bank M&As in the U.S.A. with respect to the level of acquirer's gender diversity on Board of Directors (BoDs). The dataset was consisted of 1,130 bank M&As in the U.S.A. over the period 2003-2018. To estimate the wealth effects the event study methodology was conducted. Cumulative Abnormal Returns were estimated using both the Carhart four-factor model and the market model using the Datastream U.S. bank index as proxy for the market portfolio. For the entire period, across the three-day event window, acquirer's CARs were significant and equal to -0.32% for acquirers with one or more women on board whereas CARs were insignificant for acquirers without women on board. With respect to the three-day (-1,1) CAR over the post banking crisis (2012-2018), acquirers without women on board experienced significantly positive CARs (1.48%), whereas acquirers with women on board presented insignificant gains. The results derived from the cross-sectional analysis in the post-crisis period confirm that gender diversity was negatively associated with acquirer announcement CARs. Moreover, acquirer performance, measured by ROE, was positively associated with acquirer CARs, whereas acquirer leverage and the acquisition of public targets were negatively associated with the acquirer announcement returns. The negative relationship between acquirer's CARs and the selection of public targets was robust irrespectively of the applied regression model.

Table 5 presents the summarized results derived from the literature review with respect to the market reaction upon bank Mergers and Acquisitions (M&As).

Table 5. Empirical results for the market reaction to bank M&As

Year	Authors	Research Aim	Events	Sample Period	Country	Event-study methodology	Results
2001	DeLong	Evaluation of the wealth effects of bank mergers	280 bank M&As	1988-1995	U.S.A.	Market model using the value-weighted market index for bidders and targets. Combined market value for the combined firm	Significantly negative CAR for bidders (-4.71%) but significantly positive CAR for targets (16.6%). Activity and geographically focused deals were positively associated with value creation.
2003	DeLong	Investigation of announcement effects between U.S. domestics and non-U.S. bank mergers	397 U.S. and 41 non-U.S. M&As	1988-1999	U.S. / non-U.S.	Market model using a value-weighted bank index as market benchmark	In the (-10, 1) window, acquirer's CARs were significantly higher by 2.22% for non-US deals, but target CARs were significantly lower by -6.79% for non-U.S. deals. CARs in countries with well-developed stock markets were not inherently different between the U.S. domestic and the non-U.S. bank mergers.
2003	Cornett et al.	Investigation of shareholder value and its association with CG	423 M&As	1988-1995	U.S.A.	Market model	Three-day CAR is significantly negative (-2.41%). Interstate acquisitions and diversified acquisitions are associated with significant negative abnormal returns.
2006	Campa and Hernando	Evaluation of performance of M&A	244 M&As in financial industry	1998-2002	EU, 15 countries	CAPM using the financial sector market index of each country	Three-day CAR is significantly positive (3.24%) for targets whereas it is significantly negative (-0.87%) for acquirers. Long-run returns were insignificantly different from zero both for bidders and targets.
2007	Delong and Deyoung	Evaluation of the information spillovers of large bank M&As	216 bank M&As	1987-1999	U.S.A.	Market model with Datastream bank index as market benchmark. Combined abnormal returns	Significantly negative (positive) CAR in the (-10, 1) window for acquirers (targets) that equal to -2.39% (16.43%). Insignificant abnormal returns for combined firms. Results support the learning-by-observing hypothesis and are consistent with the semi-strong EMH.
2007	Gupta and Misra	Analyzing the association between deal size, bid premiums and gains	503 M&As	1981-2004	U.S.A.	Market model with the CRSP equally weighted index as market benchmark for bidder, targets and the combined firm	Three-day (-1,1) acquirer (target) CARs were significantly negative (positive) and equal to -1.84% (16.12%). Combined CARs were statistically significant (+0.29%). The impact of deal characteristics on shareholder wealth differed between value-enhancing and value destroying deals.
2008	Hagendorff et al.	Investigation of the effect of investor protection on acquirer shareholder wealth	204 M&As	1996-2004	U.S.A. and E.U.	Market model with Datastream national bank index as market benchmark	Three-day CAR is significantly negative for the whole acquirers (-0.50%) and for the U.S. acquiring banks (-0.70%) but significantly positive for the EU acquiring banks (0.09%). Investor protection in target country is significant negatively associated with bidder abnormal returns.
2009	Becher	Analyzing the wealth effects for bidders around the passage of Riegle Neal Act	114 M&As	1994-1996	U.S.A.	Market model with a dummy variable (for the passage of legislation) using the CRSP value-weighted index	Bidders who engage in M&As after the passage of Riegle Neal Act received statistically significant and positive returns around the passage of the legislation.
2011	Hagendorff and Vallascas	Evaluation of the association between CEO pay incentives and risk-taking	172 M&As	1993 - 2007	U.S.A.	Market model for the twelve-day event window (-10, 1)	CAR on average equals to -0.94% for the whole sample and is negatively associated with the acquirer default risk effects. CEOs with higher levels of pay-risk sensitivity engage in risk-increasing bank mergers.
2011	Hankir et al.	Investigation of the wealth effects upon M&As	600 M&As	1990-2008	North America and Europe	Alternative asset pricing models using the index model, the constant mean return model and the CAPM with bank indices as benchmarks	For the whole sample, in the seven-day event window acquirers presented significantly negative announcement CARs (-0.89%) whereas targets presented significantly positively announcement CARs (+15.72%).
2012	Goddard et al.	Evaluation of bank M&As in emerging markets	132 M&As	1998-2009	Asia and Latin America	Modeling abnormal returns as regression coefficients on dummy	M&As created value for target firms. Acquirers did not lose value. Geographically diversified deals, selection of underperforming targets, selection of share offer

						variables	payment, and government-instigated deals presented higher acquirer value.
2012	Hagendorff and Keasey	Evaluation of the impact of board diversity on acquirer wealth effects upon merger announcements	148 M&As	1996-2004	U.S.A.	Market model using the Datastream U.S. banks as market benchmark	Significant negative abnormal returns upon merger announcements. The three-day (-1,1) CAR equaled to -0.70% and five-day CAR equal to -0.47%. Occupational board diversity was positively associated with acquirer value. Tenure diversity and age diversity were negatively associated with acquirer CAR. Board gender diversity had insignificant impact on CAR.
2013	Beltratti and Paladino	Analyzing the performance of M&As during the 2007-2010 crisis	139 M&As	2007-2010	Europe	Alternative event-windows using the Eurostoxx bank index as benchmark	Insignificant CARs around the announcements but significantly positive CARs upon the completions.
2013	Ghosh and Petrova	Investigation of the association between probability of value-reducing acquisitions and CG structures	936 M&As	1991 - 2011	U.S.A.	Market model with the CRSP value-weighted index as market benchmark	Three-day CAR is significantly negative in the post IBBEA period (-0.76%) as well as in the post-FSMA period (-0.26%). in the post FSMA period, the probability of engaging in value destroying deals as well as the announcement abnormal returns are significantly associated with the governance indices.
2014	Filson and Olfati	Evaluation of the combined CARs for BHC acquisition with respect to GLBA diversification	168 BHC M&As	2001-2011	U.S.A.	Four-factor model	For the whole sample, positive and statistically significant combined CARs that equal to 0.013 in the three-day (-1,1) event window. M&As with increased GLBA diversification presented higher combined CARs compared to M&As with decreased GLBA diversification.
2019	Leledakis and Pyrgiotakis	Investigation of the effect of Dodd-Frank Act (DFA) on abnormal returns upon bank mergers.	670 M&As	1990-2014	U.S.A.	Market model using the value-weighted market index as benchmark. Bidder, target and combined cumulative abnormal returns for the three day (-1, 1) window	Significantly negative abnormal returns for acquiring banks over the examined period (-1.66%) but positive combined cumulative abnormal returns (0.90%) over the examined period. Abnormal returns after the DFA are significantly higher for target CARs. Small bank mergers are associated with significantly higher cumulative abnormal returns after the DFA, compared to large mergers.
2019	Tampakoudis et al.	Analyzing the wealth effects of bank M&As with respect to the financial crisis	51 M&As and 28 transactions	1997-2018	Greece	Market model with the ASE General Index and Carhart four-factor model. CARs were estimated both upon the announcements and the completions	The financial crisis had a neutral effect on the acquirer announcement returns. However, acquirer CAR was significantly negative upon the completions of M&As.
2020	Montgomery and Takahashi	Evaluation of the effects of bank M&As on shareholder value of client firms	46 M&As	1990-2012	Japan	Market-adjusted model and BHARs using the TOPIX weighted index as benchmark for the market portfolio	For the whole sample, bank merger announcements were associated with increases in the wealth of client companies. The results were different upon bank mega-mergers or upon mergers from undercapitalized banks.
2021	Leledakis et al	Assessing the wealth effects with respect to the target listed status and the financial advisors	2,008 M&As	1984-2015	U.S.A.	Market adjusted model using the CRSP value-weighted index	For the whole sample, significant five-day (-2,2) CARs equal to -0.22%. Acquirer of private (public) targets experienced significant positive (negative) CARs that equal to 0.57% (-1.45%). Acquirers of public target have even higher CAR when they use financial advisors.
2022	Tampakoudis et al.	Examination of the impact of board gender diversity on bank M&As	1,130 M&As	2003-2018	U.S.A.	Carhart four-factor model and market model using the Datastream U.S. bank index as proxy for the market portfolio	In the post-crisis period (2012-2018), acquirer board gender diversity was significantly negatively associated with the acquirer announcement CARs. The acquisition of public targets had also a negative impact on the acquirer performance upon bank M&A announcements.

2.7. Economic Policy Uncertainty and Mergers & Acquisitions

Nguyen and Phan (2017) in their study examined the effect of policy uncertainty on a plethora of M&A outcomes. The dataset was consisted of 6,376 M&As in the U.S. (M&As that were announced from both financial firms and utility firms were omitted from the sample) over the period 1986-2014. The level of policy uncertainty was measured using the Baker et al (2016) overall BBD index for policy uncertainty. Specifically, the policy uncertainty was measured using the natural logarithm of arithmetic or weighted mean BBD index for the year preceding the deal announcements. The short-run performance upon M&As was estimated using the event-study methodology. In particular, the three-day (-1,1) acquirer's announcement CAR was estimated using the market model with the value-weighted CRSP index as market benchmark. To evaluate the impact of policy uncertainty on the M&A outcomes several multivariate models were applied. They provided evidence that policy uncertainty was significantly negatively associated with the level of acquisitiveness suggesting that during periods of high policy uncertainty there were increases in the number of deal announcements. Moreover, the policy uncertainty had a statistically significant and positive impact on the time to completion implying that amid policy uncertainty more time was needed for deal completions. Considering the selected method of payment, the results showed that the selection of stock-only financed acquisitions was significantly positively affected by the levels of policy uncertainty and therefore during periods of high uncertainty acquirers tended to use stock as method of payment. Policy uncertainty was also affected the bid premiums and specifically there was a negative relationship between policy uncertainty and the takeover premiums. With respect to the acquirer's wealth upon the M&A announcements, the results confirmed that policy uncertainty positively affects the shareholder wealth. Specifically, acquirers earned significantly higher CARs during periods of high policy uncertainty. Therefore, policy uncertainty had a positive impact on the acquirer's value upon M&A announcements. However, the results showed that target CARs were negatively affected by the level of policy uncertainty.

Bonaime et al. (2018) examined whether policy uncertainty had effect on M&As. The sample contained 32,286 M&As in the U.S. over the period 1985-2014. The policy uncertainty was measured using the Baker et al (2016) BBD index. The effect of policy uncertainty on M&A decisions was estimated using multivariate analyses. The bidder announcement returns were estimated over both the three-day and the five-day event widows as the acquirer's BHAR net the BHAR for the CRSP value-weighted index. According to the results, the policy uncertainty had a statistically significant and negative impact on the likelihood of M&As. The above finding was robust to alternative subcomponents of policy uncertainty. In particular, one standard deviation increase in the level of policy uncertainty was associated with 6.6% decline in the aggregate deal value and 3.9% decline in the number of M&As within the next 12-month period. Considering the acquirer's announcement CARs, the three-day CAR

for M&As that were announced during periods of low (high) uncertainty was statistically significant and equal to 0.0127 (0.0147). However, there were insignificant differences in CARs between the two sub-groups. With respect to other deal characteristics, they found that policy uncertainty was positively associated with both the takeover premium and the number of material adverse clause (MAC) exclusions, but it was negatively associated with the termination fees.

Lee (2018) analyzed the cross-border M&As in period of political uncertainty with respect to the bargaining outcomes. The sample was consisted of 921 cross-border mergers in 43 countries over the period 1990-2011. The political uncertainty was measured using dummies for pre-election periods. To assess the gains derived from M&As, the event study methodology was used. In particular, the main dependent variable is the Δ$CAR which captured the target gains relative to the acquirer's gains. The CARs were estimated over the seven-day window (-3,3) using the two-factor model which took into account simultaneously the movements of both the national equity market index and the MSCI world index. The results derived from the cross-sectional analysis showed that target gains relative to acquirer's gains (Δ$CAR) were statistically significantly and negatively affected by the dummy of election year suggesting that in election years the relative gains of targets were significantly lower compared to their relative gains in other periods. They also argued that during periods of high uncertainty in the host country the bargaining power of foreign bidders was increased which in turn contributed to favorably M&A outcomes for bidding firms.

Cao et al. (2019) evaluated the effect of political uncertainty on cross-border acquisitions. The political uncertainty was measured using the timing of political elections in the target (or in the acquirer) country. The dataset contained 17,234 cross-border acquisitions in 47 countries over the period 2001-2013. During the above period there were 151 national elections. To estimate the valuation outcome of M&As the event-study methodology was used. Acquirer's CARs were measured in the seven-day (-3, 3) event window using the market model with value-weighted market indices as benchmarks. The results indicated that in the year before national elections in the target (acquirer) country, there was decline (rise) in the number of inbound (outbound) cross-border deals. Moreover, there was a drop by 2.7% in the number of cross-border acquisitions when in both acquirer and target countries there were upcoming elections. Considering, the market reaction to cross-border acquisitions, acquirer's announcement CARs were significantly higher (lower) by about 2.3% (-1.8%) for the acquisition of targets in year prior to national elections in the acquirer (target) country. Moreover, there was a drop by about 1.5% in acquirer's CARs when in both acquirer and target countries there were upcoming elections. Overall, the results showed that the political uncertainty was associated with the volume, the deal characteristics and well as the outcomes derived from cross-border acquisitions.

Adra et al. (2020) evaluated the impact of monetary-related policy uncertainty on the outcome of U.S. M&As. The dataset was consisted of 12,350 mergers in the U.S. during the period 1986-2017. The monetary policy was measured with the change in the Federal funds rate (FFR) level (i.e. negative (positive) change reflected expansionary (contractionary) monetary policy), whereas the monetary policy uncertainty (MPU) was measured using the news-based categorical index of monetary policy uncertainty of Baker et al (2016). To assess the valuation effects upon M&As, the five-day (-2, 2) acquirer's CARs were estimated using the Fama-French three-factor model. According to the results derived from the univariate analysis, acquirer's CARs for M&As that were announced during contraction monetary policy periods were significantly lower by about -0.79% compared to acquirer's CARs for M&As that were announced during expansion monetary policy periods. Moreover, acquirer's CARs for M&As that were announced during periods of high MPU were significantly lower by about 0.49% compared to the acquirer's CARs for M&As that were announced during periods of low MPU. The results derived from the multivariate analysis for the whole sample showed that FFR was significantly negatively associated with the acquirer's CARs. Even though the pre-announcement level of MPU had a significant positive impact on acquirer's CARs, the announcement level of MPU was significantly negatively associated with acquirer's CARs, suggesting that M&As that were announced during periods of high MPU generated lower CARs. Moreover, the announcement MPU was significantly positively associated with the bid premiums. They also argued that the FFR constituted a significant factor that explained the reduction in the aggregate M&A activity.

Borthwick et al. (2020) replicated the study of Bonaime et al. (2018) in order to estimate the impact of policy uncertainty on mergers in China. The sample was consisted of Chinese M&As over the period 2003-2017 using 20,966 firm-year observations. The economic policy uncertainty was measured using the Baker et al (2016) overall BBD index for EPU as well as two alternative indices. The results derived from the cross-sectional analysis indicated that the likelihood for M&As was negatively affected by the level of policy uncertainty. They concluded that policy uncertainty was negatively associated with the M&A likelihood in China and this result was consistent with the findings of Bonaime et al. (2018). Therefore, despite the institutional differences that exist between China and U.S., there was a negative impact of economic policy uncertainty on M&As.

Sha et al. (2020) evaluated the impact of economic policy uncertainty on M&A in China using 4,188 deals over the period 2001-2018. The policy uncertainty was measured using the natural logarithm of EPU index by Baker et al. (2016) for the six-month period at year preceding the announcements. The acquirer's value upon M&As was assessed using the event-study methodology. The CAPM was applied using over various event windows centered on the announcement date. The results showed that, for the whole sample, during periods of high economic policy uncertainty it was more

likely for Chinese firms to engage in merger activities. However, the above results were different between state-owned and non state-owned firms. In particular, amid high policy uncertainty, it was less likely for state-owned enterprises to involve in M&As activities relative to the non state-owned enterprises. Furthermore, the selection of cash-only as method of payment was less preferable for state-owned enterprises. Considering the effect of policy uncertainty on the acquirer's value, the results suggested that policy uncertainty was significantly positively associated with acquirer's announcement CARs. In particular, the coefficient of EPU on acquirer's CARs was statistically significant at the 1% level irrespectively of the applied event-window. The above result was stronger for the state-owned enterprises given that the interaction term between EPU and state-owned dummy was positive and statistically significant at the 1% level.

Gregoriou et al. (2021) analyzed the relationship between economic policy uncertainty and cross-border M&As. The sample was consisted of 22,112 cross-border M&As in 23 countries over the period 2004-2017. To evaluate the impact of policy uncertainty on cross-border deal volume, two types of M&A flows were analyzed: inbound acquisitions (cross-border deal activity of the target country) and outbound acquisitions (cross-border deal activity in the acquirer country). The economic policy uncertainty was measured by the news-based index provided by Baker et al (2016). In the cross-sectional analysis the policy uncertainty index was measured using the natural logarithm of the twelve-month weighted mean policy uncertainty index. The gains from M&As were estimated using the event-study methodology with the market model. In particular, both acquirer's dollar CARs minus target's dollar CARs ($\Delta\$CAR_{acq\text{-}target}$) and acquirer's CARs were measured over across both the three-day (-1, 1) and the seven-day (-3,3) event windows. The results showed that in periods of high economic policy uncertainty there was increase in the level of outbound deals (for the country in which high policy uncertainty existed) but a decrease in the level of inbound deals. Moreover, in periods of high uncertainty, acquirers tend to use stock as a method of payment whereas they paid lower takeover premiums. They also found that during periods of high policy uncertainty bidders needed more time to complete the deals. Considering the impact of policy uncertainty on the announcement returns, the results showed that the level of economic policy uncertainty in the target home country was negatively associated with both the $\Delta\$CAR_{acq\text{-}target}$ gains and the acquirer's CARs suggesting that in periods of higher policy uncertainty in the target country there were higher gains from cross-border M&As. Moreover, the economic policy uncertainty in the acquirer country was not significantly associated with the gains. However, the differences in the level of policy uncertainty between the target country and the acquirer country ($EPU_{target\text{-}acquirer}$) were significantly negatively associated with the M&A gains.

Li et al. (2021) evaluated the effect of economic policy uncertainty on cross-border M&As using deal announcements from Chinese multinational enterprises in 21 host

countries over the period 2001-2017. The economic policy uncertainty was measured by the Baker et al (2016) index using the annual mean index. According to the results, the levels of economic policy uncertainty in the home country were associated with the promotion of cross-border M&As, whereas the levels of economic policy uncertainty in the host country were associated with decreases in the level of cross-border M&As. The results were different with respect both between periods of financial crisis and normal periods and between developed and developing countries.

Paudyal et al. (2021) examined the impact of economic policy uncertainty on 34,229 cross-border mergers from 20 countries over the period 1997-2017. To estimate the valuation effects upon M&A announcement, the event study methodology was used. In particular, five-day (-2, 2) CARs were estimated using the market-adjusted model with the value-weighted market return as proxy for the market portfolio. The results showed that economic policy uncertainty was significantly negatively associated with both the number and the volume of deal announcements. However, the negative impact of policy uncertainty on the volume or the number of cross-border acquisition could be positively moderated by the institutional quality, the business environment and the political risk in the host country. The results derived from the multivariate analysis showed that increases in EPU in the target (acquirer) country were significantly negatively (positively) associated with the five-day target (acquirer) CARs. Moreover, the differences in the increases of EPU between the target and the acquirer country had statistically significant and negative impact on the combined CARs.

Chahine et al. (2021) examined the impact of policy uncertainty on U.S. mergers. The political uncertainty was assesses using evidence from the 2016 presidential election. The dataset was consisted of 2,573 deals in a four-year period (November 10, 2014 to November 9, 2018) surrounding the Trump's Election on 2016. The market valuation was captured using the market-to-book ratio (M/B) ratio. The results indicated that both the number of M&A deals and target valuation were increased in the post-election period. Moreover, the results showed that post-election dummy had a significantly positive impact on the adjusted premium paid by acquirers.

Li et al. (2022) evaluated the impact of host country's economic policy uncertainty on cross-border deals. The sample contained 279 cross-border deals that were announced by Chinese public listed firms involving 29 host countries over the period 2008-2017. The economic policy uncertainty was measured using the Baker et al (2016) BBD overall index for the host country. The performance of M&As was measured using the ROA ratio both in the short-run (at the year-end of the announcement) and in the mid-term or the long-term (one, two, or three years after the announcement). They found that economic policy uncertainty was significantly negatively associated with the scale of cross-border deals, measured by the deal size. This association was stronger in the case of non-state firms. Considering the performance of cross-border deals, the

results showed that the relationship between economic policy uncertainty in the host country and the short-run performance (ROA) was U-shaped, whereas the relationship between economic policy uncertainty and mid-term performance was negative.

Shams et al. (2022) investigated the association between economic policy uncertainty and the performance of acquisitions. The dataset was consisted of 2,331 deals announced by Australian listed firms over the period 2001-2015. The economic policy uncertainty (EPU) was measured using the Baker et al (2016) overall index for EPU. The market reaction to M&As was estimated using the five-day (-2,2) acquirer's CARs with the market model and the ASX All Ordinaries Index was used as proxy for the market portfolio. The multivariate analysis was used in order to analyze the impact of change in (month/quarter) EPU on the acquirer's CARs. The results showed that changes in EPU were significantly negatively associated in the acquirer's CARs, suggesting that increases in EPU decreased the acquirer's wealth. Furthermore, the results showed that economic policy uncertainty was significantly positively associated with the bid premiums, suggesting higher bid premiums for M&As that were announced during periods of high-uncertainty. On the other hand, policy uncertainty was significantly negatively associated with both the time to completion and the likelihood of deal completion.

Table 6 presents the summarized results derived from the literature review with respect to association between economic policy uncertainty (EPU) and outcomes of Mergers and Acquisitions (M&As).

Table 6. Empirical results for the association between Economic Policy Uncertainty and M&As

Year	Authors	Research Aim	Events	Sample Period	Country	Event-study methodology	Results
2017	Nguyen and Phan	Analyzing the impact of policy uncertainty on various M&A outcomes	6,376 corporate M&As	1986-2014	U.S.A.	Three-day (-1, 1) event window using the market model with the CRSP index as market benchmark	Policy uncertainty was positively associated with the time to completion, the selection of stock-only financed deals, and the acquirer announcement CARs, whereas it was negatively associated with the M&A likelihood, bid premiums, and target CARs.
2018	Bonaime et al.	Evaluation of the effect of policy uncertainty on M&As	32,286	1985-2014	U.S.A.	CARs that were estimated as the acquirer BHAR net the BHAR for the CRSP value-weighted index	One standard deviation increase in the level of policy uncertainty was associated with 6.6% (3.9%) decrease in the aggregate deal value (number of M&As within the next 12-month period)
2018	Lee	Analyzing the cross-border M&As amid political uncertainty	921 cross-border M&As	1990-2011	43 countries	Two-factor model using both the national equity market index and the MSCI world index	The target relative gains in election years were significantly lower compared to their relative gains in other periods
2019	Cao et al.	Investigation of the effect of policy uncertainty on cross-border M&A outcomes	17,234 cross-border deals	2001-2013	47 countries	Seven-day (-3, 3) CARs using the market model with value-weighted market indices as benchmarks	The political uncertainty was associated with the volume, the deal characteristics and the outcomes derived from cross-border acquisitions. Acquirer's CARs drop by about 1.5% when in both acquirer and target countries there were upcoming elections.
2020	Adra et al.	Analyzing the effect of monetary-related policy uncertainty on M&A outcomes	12,350 M&As	1986-2017	U.S.A.	Five-day (-2,2) CARs using the Fama-French three-factor model	Acquirer's CARs for M&As that were announced during periods of high MPU were significantly lower by about 0.49% compared to the acquirer's CARs for M&As that were announced during periods of low MPU.
2020	Borthwick et al.	Replication of the study of Bonaime et al. (2018) for Chinese M&As	-	2003-2017	China	-	The likelihood for M&As was negatively affected by the level of policy uncertainty
2020	Sha et al.	Investigation of the effect of economic policy uncertainty on M&As	4,188 M&As	2001-2018	China	CARs using the CAPM using alternative windows	Economic policy uncertainty was significantly positively associated with the acquirer value.
2021	Gregoriou et al.	Evaluation of the relationship between economic policy uncertainty and cross-border deals	22,112 cross-border M&As	2004-2017	23 Countries	Three-day (-1,1) and Seven-day (-3,3) dollar CARs using the market-model	High economic policy uncertainty in the target home country was significantly negatively associated with the M&A gains.
2021	Li et al.	Analyzing the effect of economic policy uncertainty on cross-border M&As	<200 M&As	2001-2017	China and 21 host countries	-	Economic policy uncertainty in the home country was associated with the promotion of cross-border M&As, whereas economic policy uncertainty in the host country was associated with decreases in the level of cross-border M&A activity
2021	Chahine et al.	Evaluation of the impact of Trump's Election on U.S. M&As	2,573 M&As	2014-2018	U.S.A. / cross-border	-	M&A deals and target valuations were increased in the post-election period.
2021	Paudyal et al.	Examination of the impact of economic policy uncertainty on cross-border deals	34,229 cross border M&As	1997-2017	20 countries	Five-day (-2, 2) CARs using the market-adjusted model with the value-weighted market index	The EPU was negatively associated with both the number and the volume of deal announcements. Increases in EPU in the target (acquirer) country were significantly negatively (positively) associated with the five-day target (acquirer) CARs
2022	Li et al.	Analyzing the effect of economic policy uncertainty on cross-border M&As	279 M&As	2008-2017	China and 29 involving host countries	-	There was U-shape relationship between policy uncertainty and short-run performance (measured by ROA). Economic policy uncertainty negatively affected the deal size, and the mid-term performance.
2022	Shams et al.	Evaluation of the impact of EPU on the acquirer CARs	2,331 M&As	2001-2015	Australia	Five-day (-2, 2) CARs using the market model with the ASX All Ordinaries Index as benchmark	Negative association between Economic Policy Uncertainty and acquirer's CARs upon M&A announcements.

Chapter 3: Research Methodology

This chapter presents the research methodology that is used to analyze the wealth effects of bank M&As as well as the impact of policy uncertainty on the performance of bank M&As. In particular, this chapter describes the sample selection criteria, reports both the descriptive statistics and the multicollinearity diagnostics, presents both the event study methodology and the applied asset pricing models, illustrates the selection of the control variables and analyzes the econometric techniques that are used to explore the research objectives of the current thesis.

3.1. The Data

This thesis utilized a dataset of bank Mergers and Acquisitions (M&As) in the U.S. over the period 1986-2020. The starting point of the sample period coincides with the starting point of the period in which data for Economic Policy Uncertainty (EPU) at year-end preceding the deal announcements are available. Bank M&As announcements as well as deal-related and bank-related data were retrieved from the Refinitiv database. The dataset complies with the criteria that are described below:

1. The deals are announced over the period January 1, 1986 to December 31, 2020 and are completed (Masulis et al., 2007) with a completion date (effective date) prior to December 31, 2020.
2. Bidders are public firm that are domiciled in the U.S. and are listed in a major stock market (i.e. NASDAQ, NYSE, or AMEX).
3. Targets are public, private, subsidiary, or mutual companies that are domiciled in the U.S.
4. Both bidders and targets belong to the banking sector (e.g. commercial banks, saving institutions, or banking holding companies). In line with a number of related studies in the field of bank M&As (Brealey et al., 2019; Leledakis and Pyrgiotakis, 2019), the sample contains deals between participants with a three-digit SIC Code that equals to 602 (commercial banks) and 603 (saving institutions) as well as a four-digit SIC code that equals to 6712 (bank holding companies)[6].
5. The acquirer had less than 50% of target firm (before the announcement) and raised its interest from less than 50% to more than 50% (after the announcement) (Chu et al., 2022; Eaton et al., 2021a; Hammoudeh et al., 2022; Leledakis and Pyrgiotakis, 2019; Liu et al., 2022).
6. Following relevant studies, deals with very small size are omitted from the dataset. In particular, the dataset contain deals both with deal value that is equal or greater than $1mil. (Adra et al., 2020; Masulis et al., 2007; Paudyal et

[6] The Standard Industrial Classification (SIC) system search is available at: https://www.osha.gov/data/sic-search (Assessed on 01 January 2022).

al., 2021) and with relative deal size, measured by the deal value scaled by the bidder's market value, that is equal or greater than 1% (Masulis et al., 2007).
7. Deals that are characterized as buybacks, exchange offers, or recapitalizations are omitted from the dataset (Cao et al., 2019; Paudyal et al., 2021).
8. To avoid the effects derived from confounding events in the sample, M&As that are announced from the same bidder within 20 days are excluded from the dataset (Alexandridis et al., 2017; Antoniou et al., 2007; Fuller et al., 2002).

To estimate the valuation effects of bank M&As sufficient stock market data are needed (Masulis et al., 2007) and therefore M&As from bidders with insufficient data are omitted from the sample. According to the above criteria, the final dataset is consisted of 3,107 bank M&As in the U.S. over the period 1986-2020. With respect to the deal-specific characteristics, table 7 reports the annual distribution of the M&As in the sample.

According to the results presented in the table 7, the maximum number of M&As was reported in the year 1994 (180 deals) whereas the minimum number of M&As occurred in 2020 (14 deals). In particular, the peak of the number of M&As coincided with the initial phase of the fifth merger wave (1993-2001). Given that 122 mergers announced in 2004, there was a similar pattern during the sixth merger wave that started in 2003. Considering the geographic focus of the bank M&As, the sample is separated into two groups. Intrastate deals are referred to M&As between acquirers and targets in the same U.S. states, whereas interstate deals are referred to M&As between acquirers and targets across states. Table 7 shows that the majority of bank M&As (56.5%) namely 1,754 deals are characterized as intrastate deals while the rest (43.5%) are interstate deals.

With respect to the industry orientation, the sample is also separated into two groups. Focused deals are characterized the M&As in which both acquirers and targets share the sample two-digit Standard Industrial Classification (SIC) code. On the other hand, diversified deals are the M&As that are announced between companies that have different two-digit SIC code. 82.9% of the M&As in the sample are industry focused suggesting that both bidders and targets belong to the same specific industry sector and therefore implement a horizontal consolidation strategy while only 17.1% of the announced M&As is referred to vertical deals. Prior studies analyzed the impact of the target listing status on the M&As outcome and therefore to assess the role of target listing status the deals are distinct between those referred to listed targets and those referred to unlisted targets. Although, the acquisition of unlisted status was more often over the period 1986-1994, for the entire period the results indicate that deals are separated almost 50-50 as regards the target listed status. In particular, the sample contains 1,531 acquisitions of public targets and 1,576 acquisitions of non listed targets.

Table 7. Annual M&A activity by target firm's state, industry, listing status and method of payment

	All	Intrastate	Interstate	Focused	Diversified	Listed	Unlisted	Cash	Stock	Combo	Choice	D.V.	M.V.	CAR	BHAR 3-years	Days	Bid premium
1986	70	36	34	60	10	25	45	9	35	3	0	148.01	832.03	-0.74%	-44.29%	191.9	30.42
1987	66	25	41	55	11	28	38	8	33	5	3	138.37	688.87	-1.11%	-56.21%	215.7	44.56
1988	47	19	28	43	4	18	29	8	23	1	0	68.02	586.56	-0.89%	-35.59%	189.6	63.02
1989	77	44	33	71	6	36	41	13	44	3	1	61.06	626.97	-0.84%	9.47%	227.3	57.35
1990	49	31	18	43	6	14	35	11	20	4	0	70.83	785.40	-0.13%	47.62%	260.1	53.23
1991	69	41	28	58	11	33	36	11	33	8	2	194.56	1296.49	0.43%	1.63%	216.9	61.56
1992	98	51	47	89	9	42	56	12	58	9	1	152.77	1438.11	0.39%	-0.15%	212.1	68.98
1993	144	81	63	127	17	60	84	28	86	11	2	82.31	1360.77	-0.42%	2.05%	199.1	53.73
1994	180	100	80	153	27	76	104	37	97	13	7	91.67	1299.00	-0.39%	47.95%	188.1	30.08
1995	152	86	66	138	14	85	67	24	96	10	1	292.68	1397.27	-0.66%	-2.91%	177.5	36.25
1996	140	76	64	119	21	67	73	22	79	10	4	155.58	1655.25	0.04%	-62.33%	155.2	35.81
1997	178	102	76	147	31	95	83	24	116	10	5	434.40	2910.44	-0.31%	-59.42%	151.7	35.90
1998	170	92	78	133	37	77	93	14	131	4	3	340.22	2827.75	-0.89%	0.29%	151.7	28.71
1999	123	71	52	93	30	71	52	16	84	7	7	259.98	3426.38	-1.66%	68.84%	152.0	42.89
2000	103	57	46	81	22	69	34	18	52	9	7	367.58	3435.26	-0.90%	74.33%	148.4	48.43
2001	101	66	35	67	34	54	47	25	31	18	13	264.32	3484.40	-0.10%	44.00%	138.6	46.45
2002	74	48	26	52	22	43	31	18	9	15	16	199.84	2758.13	0.93%	-11.29%	142.5	45.72
2003	109	66	43	89	20	53	56	28	17	23	22	241.94	2358.90	-0.60%	-17.73%	147.8	32.11
2004	122	80	42	102	20	66	56	29	21	29	26	341.92	2529.81	-0.48%	-48.29%	145.0	33.37
2005	111	70	41	81	30	45	66	28	17	34	22	241.77	2368.06	-0.70%	-30.78%	146.3	32.12
2006	98	51	47	63	35	54	44	22	15	34	18	464.18	3038.11	-0.78%	-44.19%	147.7	34.90
2007	78	43	35	57	21	41	37	12	8	27	21	370.14	4250.10	-0.90%	-34.33%	151.6	41.91
2008	32	21	11	29	3	20	12	5	10	9	7	774.95	5282.17	-1.56%	-50.96%	136.9	38.75
2009	21	15	6	15	6	12	9	5	9	3	2	142.21	1189.50	0.58%	-41.39%	150.9	54.76
2010	27	19	8	24	3	18	9	8	8	5	2	269.93	2195.71	-2.38%	-30.98%	151.3	71.67

2011	29	17	12	27	2	16	13	4	7	10	6	546.26	4342.03	-0.39%	-15.73%	201.9	84.20
2012	48	22	26	43	5	25	23	10	13	17	5	196.21	1389.14	-0.60%	-0.59%	154.7	81.79
2013	74	41	33	66	8	37	37	13	12	31	10	175.44	887.30	1.16%	15.45%	162.0	47.39
2014	97	51	46	90	7	50	47	16	29	28	12	158.50	1412.56	0.96%	13.20%	167.9	41.79
2015	94	54	40	81	13	42	52	22	19	31	20	176.95	1690.77	0.06%	-1.59%	155.7	33.78
2016	75	40	35	60	15	38	37	12	14	30	17	219.72	1734.11	0.09%	-34.42%	157.9	39.75
2017	86	51	35	78	8	43	43	7	40	30	7	269.22	1696.28	0.27%	-72.14%	159.7	31.40
2018	87	42	45	70	17	41	46	15	30	33	7	351.85	2215.12	-0.39%	-53.75%	141.9	21.50
2019	64	37	27	60	4	37	27	12	24	17	9	391.31	2236.71	-0.22%	-	149.7	25.86
2020	14	8	6	13	1	0	14	3	6	4	1	448.87	1136.10	-2.99%	-	139.9	10.50
Total	3107	1754	1353	2577	530	1531	1576	549	1326	535	286	-	-	-	-	-	-
% of all		56.5%	43.5%	82.9%	17.1%	49.3%	50.7%	17.7%	42.7%	17.2%	9.2%	-	-	-	-	-	-
Median	-	-	-	-	-	-	-	-	-	-	-	47.00	469.26	-0.32%	-14.87%	158	34.46

Note: This table reports the deal-specific characteristic as well as the valuations effects annually during the entire period 1986-2020. The total sample consists of 3107 bank M&As in the U.S. over the period 1986-2020. The sample is categorized with respect to the deal geographic orientation (interstate deals or intrastate deals), the industry classification for M&As announced by acquirers and targets with the same two-digit SIC code (Focused) and diversified deals for deals M&As that involve acquirers and targets with different two-digit code (Diversified), the target public status (Listed or Unlisted, the mean of payment (cash-only, stock-only, combo, or choice), the average deal value in mil. $ (D.V), the average acquirer's market value in mil. $ (M.V.), the market reaction measured by the average three-day Cumulative Abnormal Return (CAR) estimated using the market-adjusted model, the average Buy-and-Hold Abnormal Returns (BHAR) measured for a three-year period after the deal completion, the average number of days between the announcement date and the completion (effective) date (Days), as well as the Bid Premiums estimated as the excess of the offer price over the target share price four weeks before the deal announcements (Bid premium). All continuous variables are winsorized at the 1% and 99% levels.

The selection of the method of payment constitutes a crucial decision towards the M&A strategy. Considering the method of payment, M&As can by classified as follows: “cash” deals for M&As that are paid only with cash, as “stock” deals for M&As that are paid only with stocks, “combo” for M&As with a combination of cash and stock as method of payment, “choice” for M&As that are paid with a choice among different forms of payment (cash or stock or combination of both / choice among different types of stocks etc.) and “other” for the rest forms and for unknown forms of payment. Bank M&As in the U.S. are mainly paid by stock (42.7%) given that 1,326 out of 3,107 deals had this form of payment during the entire period. Deals paid only by cash constitute the 17.7% of the sample whereas combo deals had a similar proportion (17.2%).

With respect to the deal value, the mean deal value was peaked in 2008 ($774.95 mil.) whereas the minimum deal value was captured in 1993 ($82.31 mil.). Considering the market value of acquirers, the maximum market value presented in 2008 ($5,282.17 mil.) suggesting that during the first stage of the recent financial crisis large banks involving in merger activity.

As far as the market reaction upon M&A announcements is concerned, the mean three-day Cumulative Abnormal Return (CAR) reached its highest point for deals announced during 2013 (1.16%) whereas it took the minimum value in 2020 (-2.99%). The evaluation of the long-run performance measured by the three-year Buy-and-Hold Abnormal Returns (BHAR) after the completion date, the results indicate that bank M&As that announced in 2000 had the highest BHARs (74.33%) whereas deals announced in 2017 had the lowest BHARs (-72.14%) during the entire period.

The number of days between the announcement and the completion (effective) day of the M&As constitutes an index that captures the level of complexity regarding a specific deal. Bank acquisitions that were announced in 1990 had the maximum number of days for the completion (260.1 days) whereas acquisitions that were announced in 2008 had the minimum number of days (136.9 days) which indicates the necessity for immediate completion due to the financial crisis.

Bid premium is considered as the excess of the offer price over the target’s share price four weeks before the deal announcement. Mean bid premium took the highest value in 2011 (84.2) while it took the lowest value for deals that announced in 2020 (10.5).

3.2. Event Study Methodology

In line with a number of prior studies (Alexandridis et al., 2013; Delong and Deyoung, 2007; DeLong, 2003; Doukas and Petmezas, 2007; Fuller et al., 2002; Moeller et al., 2004, etc.), the performance of bank M&As is estimated using the short-run valuation effects derived by the event-study methodology. Event studies constitute a methodology that is used to analyze the asset prices reaction to new information (Ball and Brown, 1968; Fama et al., 1969). An event study utilizes data from financial (stock) markets to measure the effect of a specific event on the firm's value. In case of rational markets in which security prices respond immediately to the new available information, event studies can be used in order to evaluate the economic impact of an event (MacKinlay, 1997).

According to Brown and Warner (1980), event studies can be also used to test the hypothesis of market efficiency. In particular, when systematically non-zero excess returns persist after the announcement of a particular event, there is an indication of rejection the hypothesis that stock prices both adjust quickly and fully reflect the new available information. Furthermore, the magnitude of the excess returns (abnormal returns) upon an event is used as a measurement of the valuation effects and the impact of such the event on the shareholders' wealth (Brown and Warner, 1980). McWilliams and Siegel (1997) reviewed the basic assumptions under which the application of the event-study methodology is appropriate. These assumptions are summarized as follows (McWilliams and Siegel, 1997):

- Efficient markets: This is the basic assumption and implies that asset prices "incorporate all relevant information that is available to market traders"[7] (McWilliams and Siegel, 1997, p.630). Hence, any new relevant information will be instantaneously incorporated into stock prices. In this context, longer event windows can be used under specific circumstances (e.g. gradual diffusion of information upon a specific event), otherwise they may be considered as a violation of the EMH.
- Unanticipated events: This assumption suggests that before the official announcement of an event, the market completely lacks information relative to this specific event. Therefore, the market participants gain information that is derived directly from the event announcement. The existence of abnormal returns implies that there is a market reaction to the newly available information. In case that the event is available before its official announcement, there is an information leakage which in turn makes problematic the usage of results derived from the event-study methodology. In such a case, it is unclear the time in which market participant obtain the information relative to the event.

[7] This reflects the semi-strong form of the EMH.

- No confounding effects on the event window: There is a need to isolate the confounding effects of other events in order to assess the "pure" impact of a specific event on asset prices over the event window. It is obvious that for longer event windows it is more difficult to omit the confounding effects.

The event-study methodology contributes to the empirical research by estimating the financial (market) impact of various corporate event announcements. Announcements of corporate events diffuse information to market participants. In this context, the event-study methodology analyzes whether the incorporation of an event is associated with abnormal returns (Park, 2004). Using daily stock returns, the event study methodology is used to measure the daily abnormal returns (ARs) over a defined period around the event day or the day "0" in which the event occurs. According to Brown and Warner (1985), daily stock data are used both over the estimation period and over the event period in order to estimate the excess returns in a defined window (e.g. -5,+5) surrounding the event announcement.

The conduction of an event-study analysis can be described by the following stages. First, a definition of a specific event (event date) is needed. Second, the definition both of the estimation period (e.g. period during which the coefficients of asset pricing models are estimated) and the event-window period (period surrounding the event announcement date) is done. Third, the sufficient and appropriate financial data (e.g. security returns, market returns, model factors etc) are collected to proceed with the event-study analysis. Fourth, the expected returns of each security are estimated during the event-window period using a well-defined asset pricing model. Fifth, the calculation of daily excess returns (abnormal returns) is estimated as the difference between the actual return and the expected (normal) return of each security. Abnormal returns exist when the security returns are different from the expected (normal) returns, given the asset pricing model that is used for the estimation of the equilibrium returns. Sixth, summing up of the daily abnormal returns during an event window surrounding the event announcement (e.g. the three day [-1, 1] event-window) leads to the calculation of the Cumulative Abnormal Returns of this window. Seventh, to assess the statistical significance of the estimated cumulative abnormal returns for a sample of events appropriated statistical tests (parametric, non-parametric tests) are used.

Asset pricing models are used to estimate the normal return of each security. In an event study analysis can be applied various event windows surrounding the event date with a defined window with maximum length (e.g. -20, +20). A period before the maximum event window is usually used as estimation window for the model parameters (e.g. 250 trading days estimation window: -270, -21). The estimation window and the event window are not overlapping and consequently the event is not influence the estimation of the asset pricing model parameters (MacKinlay, 1997). The selection of an appropriate event-window is also important to assess the valuation

effects of an event announcement. According to Cuypers et al. (2017), on one hand, the selection of a shorter event-window may not be appropriate in order to assess the effects of a potential information leakage phenomenon before the event announcement or to assess the value implications when the information is gradually incorporated in the market. On the other hand, the selection of a longer event window is more likely to suffer from contamination due to the existence of confounding effects over the event window (Cuypers et al., 2017).

Moreover, the selection of short event-windows is implicitly due to the assumption of quickly, completely and unbiased market response to the public information, based on the semi-strong form of EMH (Oler et al., 2008). With respect to the selection of event-windows, the majority (67.7%) of 62 studies published in well-known management journals[8] over the period 1994-2006 used event windows that closed within five days of the event. In 22.6% of studies, the event-window was extended between 6 and 60 days after the announcement, whereas in only 9.7% of the studies the event window was longer than 60 days after the announcement (Oler et al., 2008).

According to Fama (1998), studies that use short event-windows (e.g. a few days) are less prone to bad-model errors because in such a case daily expected returns are close to zero and thus they have a marginal impact on the estimation of abnormal returns, whereas, studies that use long event-windows are more prone to the bad model-problem. Specifically, bad-model problems can be classified into two types. First, the calculation of excess returns (abnormal returns) is based on usage of an asset pricing model that estimates the normal returns and therefore the bad-model problem arises when asset pricing models cannot perfectly determine the expected returns. Second, even in the case that a true asset pricing model is used, the selection of a sample with specific patterns can produce abnormal returns due to chance. Thus, it is possible that "chance can generate apparent anomalies which split randomly between over-reaction and under-reaction" (Fama, 1998).

In an efficient market, the expected value of abnormal returns is zero. The existence of non-zero abnormal returns constitutes a test for market efficiency. Due to the misspecification of the normal equilibrium and the sensitivity of abnormal returns to the alternative applied theoretical asset pricing models, the importance of market anomalies is taken in dispute (Loughran and Ritter, 2000). Therefore, the estimation of statistically significant abnormal returns upon specific events can better give inference about the shareholders' wealth opportunities rather than for market inefficiency in general. The event study methodology has been widely used in empirical research in finance to capture the value implications of important corporate/investment decisions (Cuypers et al., 2017). However, in case that the

[8] Oler et al. (2008) reviewed studies that were published in Strategic Management Journal, Academy of Management Journal, Journal of Management, Management Science, Administrative Science Quarterly, and Journal of Management Studies.

events are anticipated (to some degree) by the market participants before the official announcements then the event studies reflect only an unanticipated or a partial effect of such the announcements (Grinblatt and Wan, 2020).

3.3. Asset Pricing Models

3.3.1. The Market-adjusted model

According to the market-adjusted returns model, the ex post abnormal return of a security is measured by the difference between the security's realized return and the return of market portfolio (Brown and Warner, 1985, 1980). In this context, abnormal return (AR) using daily returns is calculated as shown in Eq.1:

$$AR_{it} = R_{it} - R_{mt} \quad (1)$$

Where R_{it} is the daily return for the security i on day t and R_{mt} is the daily return for the market portfolio on day t. Daily returns are calculated as follows:

$$R_{it} = \log P_{i,t} - \log P_{i,t-1} \quad (2)$$

Where $P_{i,t}$ is the closing price in the trading day t for the security i.

3.3.2. The Market model

The Market model is a linear model that relates the return of a given security with the return of a market index (market portfolio). The market model is estimated as shown in Eq. 3.

$$\hat{R}_{it} = a_i + \beta_i R_{mt} + \varepsilon_{it} \quad (3)$$

$\mathrm{E}(\varepsilon_{\iota t} = 0)$

$var(\varepsilon_{\iota t}) = \sigma_{\varepsilon_i}^2$

Where $\hat{R}_{it}$ is the return of security i at the period t, R_{mt} is the return of the market portfolio at the period t, ε_{it} is the error term and a_i, β_i and $\sigma_{\varepsilon_i}^2$ are the models parameters. For the model described in Eq. 3, the ordinary least square (OLS) regression analysis is applied to estimate the parameters $\widehat{a_i}$ and $\widehat{b_i}$ over the estimation window period. The parameter $\widehat{b_i}$ shows the systematic risk for the security i. Therefore, the abnormal returns derived with the market model are estimated as shown in Eq. 4.

$$AR_{it} = R_{it} - (\widehat{a_i} + \widehat{b_i} R_{mt})$$ (4)

3.3.3. The CAPM

The Capital Asset Pricing Model (CAPM) is also used as an alternative asset pricing model (Lintner, 1965; Sharpe, 1964) and is estimated as shown in Eq. 5.

$$\hat{R}_{it} - R_{ft} = a_i + \beta_i (R_{mt} - R_{ft}) + \varepsilon_{it}$$ (5)

Where $\hat{R}_{it}$ is the return of security i at the period t, R_{mt} is the return of the market portfolio at the period t, R_{ft} is the risk-free rate, ε_{it} is the error term whereas a_i (Jensen's alpha) and β_i (systematic risk) are the models parameters. For the model described in Eq. 5, the ordinary least square (OLS) regression analysis is applied to estimate the parameters $\widehat{a_i}$ and $\widehat{b_i}$ over the estimation window period. The parameter $\widehat{b_i}$ shows the systematic risk for the security i.

3.3.4. The Fama-French (FF) three-factor model

The three-factor asset pricing model is proposed by Fama and French (1993) to explain the excess stock returns (Ri-Rf) in relation with three factors: the excess market return (Rm-Rf), the SMB factor which captures the size (market capitalization, price times shares outstanding), and the HML factor which captures the price ratio (B/M: book-to-market equity). The small minus big (SMB) factor is estimated as the difference between the returns on small-stock portfolios and big-stock portfolios with about the same weighted-average book-to-market equity. The high minus low (HML) factor is estimated as the difference between the returns of high-BE/ME portfolios and low-BE/ME portfolios with about the same weighted-average size (Fama and French, 1993). The three-factor model, as shown in Eq. 6, is estimated by regressing the excess returns of firm i against three factors: market factor, size factor and book-to-market factor.

$$\hat{R}_{it} - R_{ft} = a_i + \beta_i (R_{mt} - R_{ft}) + s_i SMB_t + h_i HML_t + \varepsilon_{it}$$ (6)

Where R_{it} is the return of security i in the period t, R_{ft} is the risk-free rate, R_{mt} is the return on the value-weight market portfolio, SMB_t is the size factor that captures the difference between the average return on the three small portfolios and the average return on the three big portfolios, HML_t is the value factor that captures the difference between the average returns on the two value portfolios and the average return on the two growth portfolios, and ε_{it} is the residual with zero mean. a_i is the intercept whereas β_i, s_i, and h_i are the coefficients of the model's factors.

3.3.5. The Four-factor model

The Carhart (1997) four-factor model is estimated by adding one more factor into the Fama-French three factor model. In particular, the (up-minus-down) momentum factor (UMD) is added. The Carhart four-factor model can be described as shown in Eq. 7.

$$\hat{R}_{it} - R_{ft} = a_i + \beta_i (R_{mt} - R_{ft}) + s_i SMB_t + h_i HML_t + u_i\, UMD_t + \varepsilon_{it} \quad (7)$$

Where R_{it} is the return of security i in the period t, R_{ft} is the risk-free rate, R_{mt} is the return on the value-weight market portfolio, SMB_t is the size factor that captures the difference between the average return on the three small portfolios and the average return on the three big portfolios, HML_t is the value factor that captures the difference between the average return on the two value portfolios and the average return on the two growth portfolios, UMD_t is the momentum factor that captures the average return on past high return portfolios minus the average return of past low return portfolios, and ε_{it} is the residual with zero mean. a_i is the intercept whereas β_i, s_i, h_i, and u_i are the coefficients of the model's factors.

3.3.6. The Five-factor model

The five-factor model proposed by Fama and French (2015) is designed by adding profitability and invest factors to augment the previous FF three-factor model. The five-factor asset pricing model performs better than the three-factor model; However, five-factor model has a weakness to capture the low average returns on small stocks with returns that behave similar to the returns of firms that invest a lot despite the existence of low profitability (Fama and French, 2015). The five-factor model can be described as shown in Eq. 8.

$$\hat{R}_{it} - R_{ft} = a_i + \beta_i (R_{mt} - R_{ft}) + s_i SMB_t + h_i HML_t + r_i RMW_t + c_i CMA_t + \varepsilon_{it} \quad (8)$$

Where R_{it} is the return of security i in the period t, R_{ft} is the risk-free rate, R_{mt} is the return on the value-weight market portfolio, SMB_t is the size factor that captures the difference between the average return on the nine small stock portfolios and the average return on the nine big stock portfolios, HML_t is the value factor that captures the difference between the average return on the two value portfolios and the average return on the two growth portfolios, RMW_t is the difference between the returns on diversified portfolios of stocks with robust and weak profitability, CMA_t is the difference between the returns on diversified portfolios of stocks of low and high investment firms and ε_{it} is the residual with zero mean. a_i is the intercept whereas β_i, s_i, h_i, r_i, and c_i are the coefficients of the model's factors.

3.4. Estimation of Abnormal Returns and Cumulative Abnormal Returns

Following MacKinlay (1997) and in line with a number of prior studies (Andriosopoulos et al., 2016; Carletti et al., 2021; Filson and Olfati, 2014; Frattaroli, 2020; Raykov and Silva-Buston, 2020; Zhang et al., 2020), the asset pricing model coefficients are estimated using OLS regression models in a window of 250 trading days (-270, -21) before the event window (-20, 20). Using the coefficients derived from the estimation of models in Eq. 3,5,6,7, and 8, the abnormal returns (ARs) are estimated by subtracting the expected (normal) returns from the realized returns of each security as was shown in Eq 4.

In line with previous related studies (Alexandridis et al., 2012; Bonaime et al., 2018; Croci and Petmezas, 2015; Elnahas and Kim, 2017; Ghosh and Petrova, 2013; Golubov et al., 2016; Kothari et al., 2009; Mitchell et al., 2004; Nguyen and Phan, 2017), the value-weighted CRSP index is used as proxy for the market portfolio. Moreover, to estimate the factor asset pricing models daily data for Fama-French and Momentum (MOM) factors in the U.S. were retrieved from the Kenneth R. French data library[9].

The event window with maximum length is the 41-day (-20, +20) event window. In line with prior studies (Alexandridis et al., 2013; Andriosopoulos et al., 2016; Asimakopoulos and Athanasoglou, 2013; Cybo-Ottone and Murgia, 2000; Dong et al., 2020; Draper and Paudyal, 2006; Hornstein and Nguyen, 2014), this thesis uses the 41-day event window (-20, +20) centered on the announcement date as the largest event window for the analysis of wealth effects. The selection of the 41-day window (-20,+20) as the max window in the analysis takes into account several possibilities such as the information leakage prior to the official announcement, the existence of insider information upon the upcoming announcements, the gradual diffusion of information, the delayed reaction, or/and the market correction related to bank M&As. Therefore the 41-day window allows a complete evaluation of the market reaction surrounding bank M&A announcements.

Across the event window (-20, 20), for each day t, the average abnormal returns (AARs) for a sample of N firms are estimated as shown in Eq. 9.

$$\overline{AAR_t} = \frac{1}{N} \times \sum_{i=1}^{N} \mathrm{AR}_{it} \tag{9}$$

Where AR_{it} is the Abnormal Return of firm i in the day t and N is the number of firms in the sample.

[9] Data for factor models are available at: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html (Assessed on 01 July, 2021).

In this thesis, the Abnormal Returns (ARs) are assessed for the 41-day period (-20, +20) centered on the announcement date. Given the estimated values for ARs across the (-20,+20) window, the accumulation of the average abnormal returns (ARs) over a defined event-window results to the measurement of the cumulative abnormal return (CAR). In this context, the CAR across the event window (t1, t2) is estimated[10] as shown in Eq. 10.

$$\overline{CAR_{t1,t2}} = \sum_{t=t1}^{t2} \mathrm{AR}_{it} \tag{10}$$

Where t_1 is the start point of the event window and t_2 the last point of the event window.

Given that mergers and acquisitions (M&As) constitute strategic corporate decisions that involve many different parties (i.e. bidders, targets, financial advisors, legal advisors, stakeholders, etc) over a processes starting from the deal negotiations and ending to the deal effective date (Becher, 2009; Cai et al., 2011; Cao et al., 2005; Grinblatt and Wan, 2020; Wan and Wong, 2009), this thesis utilizes the 41-day event period (-20, +20) surrounding the event announcement to capture the valuation effects using both the daily abnormal returns (ARs) on every single day over this specified period and the Cumulative Abnormal Returns (CARs) over various alternative event windows before, during and after the M&A announcements.

In particular, over the pre-announcement period two event windows are applied: the five-day (-5,-1) and the three-day (-2, 0) event windows. Pre-announcement event windows are commonly used in order to assess any information leakage relative to event announcements. For example, Boubaker et al. (2015) measured CARs for a pre-announcement window to evaluate the information leakage or the existence of insider information. Five announcement event-windows centered on the announcement day (day 0) are also estimated: the forty-one-day (-20, +20), the eleven-day (-5, +5), the seven-day (-3, +3), the five-day (-2, +2), and the three-day (-1, +1) event windows. Generally, short event windows are preferably used in event studies because they are less prone to other events/ confounding events as well as and they are less depended on the applied asset pricing model (Filson and Olfati, 2014). In line with related studies (Alexandridis et al., 2017, 2012; Craninckx and Huyghebaert, 2011; Filson and Olfati, 2014; Gupta and Misra, 2007; Hagendorff et al., 2008; Humphery-Jenner and Powell, 2011; Moeller et al., 2004; Nguyen and Phan, 2017; Suk and Wang, 2021), the three-day (-1, +1) event window centered on the announcement day is selected as a main window for the evaluation of wealth effects upon the M&A

[10] To conduct the event-study analysis (Abnormal Returns - ARs, Cumulative Abnormal Returns - CARs, Buy-and-Hold Abnormal Returns – BHARs) with the corresponding tests of significance the "eventstudy2" stata package is used (Kaspereit, 2020).

announcements. Moreover, three post-announcement event windows are estimated to assess the valuation effects upon the bank M&A announcements: the two-day (0, +1), the three-day (0, +2), and the five-day (1, +5) event windows.

To evaluate the statistical significance of both ARs and CARs several tests are applied. In particular, the parametric t-test (Serra, 2002), Patell-test (Patell, 1976), and Boehmer BPM-test (Boehmer et al., 1991) as well as the non-parametric Corrado-test (Corrado, 1989), and generalized Sign-test (Cowan, 1992) are assessed. Although alternative tests are applied, prior studies focused on both BMP and Corrado tests (Aktas et al., 2007; Hagendorff et al., 2008; Kolari and Pynnonen, 2011; Kolari and Pynnönen, 2010; Marks and Musumeci, 2017). In this context, the statistical significance of CARs is mainly evaluated using both the BMP-test (because its results are robust to cross-sectional return variance) and the Corrado-test (because its results are more robust to event-induced volatility and correlation and less sensitive to the existence of outliers).

3.5. Estimation of Buy-and-Hold Abnormal Returns

Buy-and-hold abnormal return (BHAR) is used as a method of measuring the long-run excess returns over a defined holding period. The BHAR from day=1 to day=T is estimated as shown in Eq. 11:

$$BHAR_i = \prod_{t=1}^{T}[1 + R_{it}] - \prod_{t=1}^{T}[1 + R_{mt})] \quad (11)$$

Where i denotes the bidder i and T denotes the holding period. R_{it} is the bidder's stock return and R_{mt} is the return for the benchmark portfolio.

To estimate the Buy-and-Hold Abnormal Return (BHAR) the CRSP value-weighted market return is selected as proxy for the benchmark portfolio (Barbopoulos et al., 2020; Chen and Wu, 2021; Dong et al., 2021; Krolikowski et al., 2017; Malmendier et al., 2018; Reyes, 2018; Suk and Wang, 2021). In line with research in the field of M&As (Lin et al., 2011; Ma et al., 2011; Suk and Wang, 2021), BHAR is estimated for holding periods that begin immediately after the deal completion (effective) date. In particular, BHAR is estimated across alternative holding periods and specifically BHAR is measured for the three-month holding period (+1,+63), the six-month holding period (+1, +126), the one-year holding period (+1, +252), the two-year

holding period (+1, +504) as well as the three-year holding period (+1,+756) after the deal completion[11].

The estimation of BHAR may be subject to three methodology disadvantages that include: a new listing bias, a positive skewness bias, and a rebalancing bias (Barber and Lyon, 1997). Furthermore, given that BHAR models are used for long-term analysis, bad-model problems may be arisen (Fama, 1998). Due to the skewness bias, the statistical significance of BHAR is assessed using the bootstrapped skewness-adjusted t-statistic (Lyon et al., 1999) which is calculated as follows:

$$t_{skewness\ -adjusted} = \sqrt{n}\left(S + \frac{1}{3}\hat{\gamma}S^2 + \frac{1}{6n}\hat{\gamma}\right) \quad (12)$$

Where:

$$S = \frac{\overline{AR_\tau}}{\sigma(AR_\tau)} \quad (13) \quad \text{and} \quad \hat{\gamma} = \frac{\sum_{i=1}^{n}(AR_{i\tau} - \overline{AR_\tau})^3}{n\sigma(AR_\tau)^3} \quad (14)$$

$\overline{AR_\tau}$ is the sample mean of abnormal returns, $\sigma(AR_\tau)$ is the cross-sectional sample standard deviation of abnormal returns for the sample of n firms, $\hat{\gamma}$ is an estimate of the coefficient of skewness and $\sqrt{n}(S)$ is the conventional t-statistic. In this context, the bootstrapping (b) skewness-adjusted (sa) t-statistic is estimated as follows (Lyon et al., 1999):

$$t_{sa}^{b} = \sqrt{n_b}\left(S^b + \frac{1}{3}\hat{\gamma}S^{b2} + \frac{1}{6n_b}\hat{\gamma}^b\right) \quad (15)$$

Where:

$$S^b = \frac{\overline{AR_\tau{}^b} - \overline{AR_\tau}}{\sigma^b(AR_\tau)} \quad (16) \quad \text{and} \quad \hat{\gamma}^b = \frac{\sum_{i=1}^{n_b}\left(AR_{i\tau}{}^b - \overline{AR_\tau{}^b}\right)^3}{n_b\sigma^b(AR_\tau)^3} \quad (17)$$

t_{sa}^{b}, S^b and $\hat{\gamma}^b$ are the bootstrapped resample analogues of t_{sa}^{b}, S, and $\hat{\gamma}$ from the original sample for b=1,…,1,000 resamples. The null hypothesis is that the mean BHAR is equal to zero for a sample of n firms and is rejected if $t_{sa}^{b} < xi^*$ or $t_{sa}^{b} > xu^*$. Where xi^* and xu^* are the two critical values at the level of significance that are calculated from the 1,000 resamples (Lyon et al., 1999).

[11] In this case, 252 days are assumed as a one-year holding period (Danbolt et al., 2015; Dong et al., 2021; Hsu et al., 2021; Jensen-Vinstrup et al., 2018; Liang, 2016; Young and Wu, 2017) and accordingly 3-month holding period accounts for 63 days whereas 6-month holding period accounts for 126 days.

3.6. Univariate and Multivariate Analyses

To evaluate the differences in the acquirer's excess returns with respect to deal-specific characteristics and several potential determinants, both univariate and multivariate analyses are applied. The univariate analysis is conducted to evaluate the existence of significant differences in the level of a variable which is in focus (i.e. Cumulative Abnormal Returns) using both the parametric *t*-test to assess null hypothesis for equal means and the non-parametric Mann-Whitney U-test (*MWU*-test) to assess the null hypothesis for equal medians between two specified sub-groups. In particular, the whole sample is separated into sub-samples with respect to the deal-related characteristics (method of payment, selection of public targets, etc) as well as with respect to the level of economic policy uncertainty (high versus low). To verify the results derived from the univariate analysis, multiple multivariate analyses are also applied as they are described in the bellow sub-sections.

3.6.1. Cross-sectional analysis for acquirer's excess returns

Multivariate analysis is used to investigate the determinants of the performance of bank M&As. To analyze the performance, alternative variables are used. Specifically, the dependent variables capture both the short-run and the long-run performance on bank M&As. The short-run performance is estimated with the event-study methodology using alternative asset pricing models (market model, market-adjusted model, four-factor model) over various event-windows surrounding the deal announcement. The long-run performance is estimated with the Buy-and-Hold Abnormal Returns (BHARs) and is used in order to test whether the results are confirmed in the long-run. In line with a number of previous studies (Barbopoulos and Sudarsanam, 2012; Faccio et al., 2006; Fuller et al., 2002; Leledakis et al., 2021; Masulis et al., 2007) the main dependent variable is the Cumulative Abnormal Return (CAR) that is estimated using the market-adjusted model with the NYSE/AMEX/NASDAQ value-weighted index as market benchmark. The cross-sectional analysis is shown in Eq. 18.

$$CAR_{i(t_1,t_2)} = a + \sum_{j=1}^{k} \lambda_j X_{ij} + \varepsilon_i \qquad i = 1 \ldots N \qquad (18)$$

Where, $CAR_{i(t_1,t_2)}$ is the Cumulative Abnormal Returns that are estimated using the market-adjusted model with the CRSP value weighted index as proxy for the market portfolio, t1 is the starting point of the event window, and t2 is the last point of the event window. In the main regression models and in line with prior studies, the three-day (-1, +1) event window is used. For robustness, the dependent variable CAR is also estimated using alternative asset pricing models across various event windows, a is the constant term of the regression model, X_{ij} is a vector of k control variables that

are employed in the cross-sectional analysis, λ_j is the k coefficients which capture the impact of the control variables on the abnormal returns, and ε_i is the error term.

To investigate the determinants of the long-run performance upon M&As, the model as shown in Eq. 19 is also applied.

$$BHAR_{it} = a + \sum_{j=1}^{k} \lambda_j X_{ij} + \varepsilon_i \qquad i = 1 \ldots N \qquad (19)$$

Where BHARi is the Buy-and-Hold Abnormal Return (as was presented in Eq. 11) over the t holding period.

Next, to evaluate the effect of Economic Policy Uncertainty (EPU) on the performance of M&As, the Baker-Davis-Bloom index (hereafter BBD) that was developed by Baker et al. (2016) is used[12]. The overall BBD index is widely used in finance (Berger et al., 2022; Chan et al., 2021; D'Mello and Toscano, 2020; Gulen and Ion, 2016; Hsieh and Vu, 2021; etc) in order to evaluate financial consequences of policy-related economic uncertainty and is also used in M&A-related studies (Bonaime et al., 2018; Nguyen and Phan, 2017).

The overall BBD index is constructed using three components (Baker et al., 2016). The first component is the news-based policy uncertainty and is derived from search results in ten large newspapers and contributes with a weight of ½ to the construction of the overall index. The second component is the tax code expiration with a weight of 1/6. The third component is referred to the economic forecaster disagreements and is measured by two sub-components. In particular, the first sub-component is the CPI forecast disagreement (with a weigh of 1/6), whereas the second sub-components is the federal/state/local purchases disagreement (with a weigh of 1/6).

To calculate the EPU that is included in the cross-sectional analysis, in line with Nguyen and Phan (2017), six alternative measurements are applied[13] to enhance the robustness of the results whereas the three-month weighted mean index at year-end preceding the M&A announcement[14] is selected as main proxy for EPU in the cross-sectional analysis.

The impact of Economic Policy Uncertainty (EPU) on the short-run performance of bank M&As is assessed using the model in Eq. 20.

[12] The data are available at: https://www.policyuncertainty.com/ (Assessed on 01/03/2021).
[13] Namely, EPU is measured using the arithmetic or the weighted mean of natural logarithm for BBD index (Baker et al., 2016) over the 12-, 6-, and 3-month period in the year-end preceding the deal announcement.
[14] For example, the three-month weighted mean BBD index for announcements during the t year is estimated using the weights of 1/6, 1/3, and 1/2 for the October, the November, and the December at the t-1 year, respectively.

$$CAR_{i(t_1,t_2)} = a + \beta_i EPU_i + \sum_{j=1}^{k} \lambda_j X_{ij} + \varepsilon_i \qquad i = 1 \ldots N \qquad (20)$$

Where, EPU is index of Economic Policy Uncertainty over alternative periods at year-end preceding the deal announcement and $\beta_i$is the corresponding coefficient. As stated above, the three-month weighted mean BBD index at year-end prior to the announcement is used as main proxy for the overall EPU. The regression model in Eq. 20 is applied to investigate the impact of EPU on acquirer's CARs after controlling for a vector X of k control variables.

Except for the overall BBD index, this thesis also utilizes ten categorical news-based indices of policy uncertainty (economic policy, monetary policy, fiscal policy, taxes, government spending, health care, national security, entitlement programs, regulation, and financial regulation) in order to separately investigate the impact of the aforementioned sources of uncertainty on the M&A outcomes. To further analyze the impact of monetary-related uncertainty on the outcomes of bank M&As, the BBD MPU index (based on Access World News) for monetary policy uncertainty is also used.

In the regression models, the independent variable EPU takes annual values and therefore is constant within each year. Therefore, following relevant studies (D'Mello and Toscano, 2020; Gulen and Ion, 2016; Lou et al., 2022; Nguyen and Phan, 2017; Phan et al., 2019; Tran and Phan, 2022) year-fixed effects are not included in regression models because their inclusion absorb the explanatory power of EPU on the M&A outcomes. However, to adjust standard errors for simultaneously correlation within both time and firm clusters, in line with Petersen (2009) and Thompson (2011), in this thesis the standard errors are two-way (double) clustered at both year and acquirer levels. This procedure of two-way clustered standard errors (time and firm) is also followed by recent studies (Berger et al., 2022; Dursun-de Neef and Schandlbauer, 2020; Gopalan et al., 2021; Gulen and Ion, 2016; Jenter and Lewellen, 2015; Kaviani et al., 2020; Shang et al., 2021; Yung and Root, 2019)[15]. In addition to the above model specifications, state fixed effects are also included in the regression models (Becker, 2007; Chatt et al., 2021; Cornaggia and Li, 2019; Cornett et al., 2021; Doukas and Zhang, 2021) in order to control for potential differences in M&A outcomes with respect to the acquirer U.S. state.

[15] To further test the sensitivity of the results, robust standard errors instead of double-clustered standard errors are included in the cross-sectional analyses and the inference of the results is unaltered.

3.6.2. Control Variables

Following studies in the merger field, a set of both firm-specific and deal-specific variables is included to regression analysis in order to control both for bidder and deal characteristics, respectively. With respect to the acquirer-specific characteristics, acquirer's size constitutes a factor that may affect the synergies derived from the mergers and is used as a control variable for the announcement valuation effects upon M&As (Bick et al., 2017; Masulis et al., 2007; Moeller et al., 2004). In line with a number of studies (Aktas et al., 2022; Arena et al., 2022; Cai et al., 2022; Chu et al., 2022; Derrien et al., 2021; Dutordoir et al., 2022; Masulis et al., 2007; Moeller et al., 2004), acquirer's size is measured as the natural logarithm of the book value of total assets in year-end prior to the deal announcement and is included as a control variable in the cross-sectional analysis.

Another factor that is associated with the M&A outcome is the acquirer's trading history. Older firms provide higher levels of information to the market participants and therefore higher firm's age is associated with lower levels of information uncertainty (Zhang, 2006). According to Draper and Paudyal (2008) the level of information asymmetry positively affects the level of acquirer's announcement gains. In this context, acquirer's AGE is also used as control variable in the cross-sectional analysis for the acquirer's CARs (Alexakis and Barbopoulos, 2020; Barbopoulos and Sudarsanam, 2012; Dong and Doukas, 2021; Jenter and Lewellen, 2015). Acquirer's age may reflect the firm's capability of gathering information as well as the acquirers' market experience for the implementation of merger activity (Adra and Barbopoulos, 2019; Chakrabarti and Mitchell, 2016). In the multivariate analysis, acquirer's AGE is measured as the natural logarithm of the number of days between the bank's first record and the announcement date (Barbopoulos and Adra, 2016).

The acquirer's operating performance is also considered as an important factor that affects the market performance of M&As. A number of previous studies in the banking sector use the Return on Assets (ROA) ratio in order to measure the banking performance (Acosta-Smith et al., 2020; Agarwal et al., 2022; Caby et al., 2022; Carletti et al., 2021; Chen et al., 2021; Cyree, 2016; Luu and Vo, 2021; Mamun et al., 2021; Nippani and Ling, 2021). Therefore, to control for the bidder's pre-acquisition performance, the ROA in year-end preceding the deal announcement is included in the multivariate analysis.

According to Park (2003), the level of pre-acquisition risk may affect the implementation of the M&A strategy. In this context, a potential determinant for M&A outcomes is the pre-acquisition bidder's risk. The ratio of reserves for loan losses to total loans also serves as an indicator for the quality of bank assets, where higher levels of this ratio represent lower asset quality (Beck et al., 2013; Kladakis et al., 2020; Nizam et al., 2019). According to Altunbas et al. (2007), higher loan-loss

reserves create expectations for future risk and therefore imply higher banking risk. In this context, loan loss reserves to total loans ratio is also used to capture the credit default risk in the banking sector (Avignone et al., 2021; Bitar et al., 2018; Mateev et al., 2022).

Leverage is also used as a control variable for the regression analysis of the acquirer's announcement CARs (Masulis et al., 2007). Following relevant studies to M&As (Adra and Barbopoulos, 2019; Wang et al., 2010), the acquirer's leverage is measured by the ratio of total debt scaled by common equity at year-end preceding the deal announcement. Except from the level of leverage, the acquirer's asset structure is also considered as a control variable. In particular, a number of studies in banking (Acosta-Smith et al., 2020; Battaglia and Gallo, 2017; Lai and Ye, 2020; Leung et al., 2015; Park and Oh, 2022; Vallascas et al., 2017) uses the ratio of total loans scaled by total assets as a proxy for the bank asset structure, the portfolio asset composition as well as the bank business model (i.e. traditional banking).

According to Dong et al. (2006), the bidder's valuation constitutes a proxy for acquirer's growth opportunities and can be measured by the price-to-book ratio (PTBV). PTBV affects the selected method of payment, the value creation from M&As, the bid premiums, as well as other deal-related factors. Based on price-to-book ratios, Sudarsanam and Mahate (2003) argue that glamour acquirers (acquirers with high PTBV) are associated with negative long-run acquisition performance. Consistent with the above finding, Andriosopoulos et al. (2016) state that glamour acquirers present lower M&A performance compared to the performance of value acquirers (acquirers with low PTBV ratios). In this context, both acquirers' growth opportunities and acquirers' market valuation are characterized as a factor that affects the M&A outcomes (Gregoriou et al., 2021; Ma et al., 2019, 2011; Rhodes–Kropf et al., 2005; Rhodes-Kropf and Viswanathan, 2004). Previous studies use price-to-book ratios as control variables for the value creation from M&As (Alexandridis et al., 2008; Andriosopoulos et al., 2016; Barbopoulos and Sudarsanam, 2012; Chong et al., 2006; Ding et al., 2021; Ismail and Mavis, 2022; Murray et al., 2017; Nguyen and Phan, 2017; Phan, 2014; Srivastav et al., 2018). In this context, to control for the acquirer's growth opportunities, the Price-to-Book ratio (PTBV) at year-end preceding the M&A announcement is included in the regression analysis.

A strand of literature in M&As recognizes the role of deal-specific characteristics on the acquirer's performance and therefore deal-related control variables are also included in the regression models. Alexandridis et al. (2013) argue first that large deals are associated with lower acquirer's value and second that deal size negatively affects the takeover premiums, which can be explained by the inherent complexity of large deals. In line with prior studies (Alexandridis et al., 2017; Fuller et al., 2002; Phan, 2014), to control for the impact of deal size on the M&A outcome, the ratio of relative size is included in the regression analysis. Relative deal size is measured as

the transaction value (deal value) scaled by the acquirer's market capitalization 21-days before the M&A announcement.

The selection of the method of payment for M&A deals is acknowledged as a factor that significantly affects the value creation from M&As. Fuller et al. (2002) state that empirical studies predict negative CARs for stock-financed deals, based on the argument that acquirers may select stock-only financed deals (cash-only financed deals) in case that their stock is overvalued (undervalued). In their study, Fuller et al. (2002) found negative CARs for stock-financed deals only in the case of acquisitions of public targets. However, Golubov et al. (2016), using a sample of U.S. M&As, provided evidence that, net of the effect of seasoned equity offering announcement, stock-financed deals were not associated with value destruction and therefore the choice of payment had no explanatory power on the acquirer's CARs. In this context, according to Alexandridis et al., (2017), stock-financed deals significantly destroy value over the period 1990-2009, present insignificant CARs over the period 2010-2015, whereas they are associated with lower CARs over the entire period. In line with a number of prior studies (Nguyen and Phan, 2017; Phan, 2014), to control for the method of payment, the multivariate analyses contain the dummy variable STOCK which is assigned the value of one for stock-only financed deals and zero otherwise.

The dataset contains only U.S. deals (both bidders and targets are U.S. firms), however, to further control for the differences in M&A outcomes with respect to differences between acquirer's and target's states the dummy intrastate is also included in the cross-sectional analysis. The deregulation in the banking sector[16] by the removal of geographic restriction affected the banking diversification and the M&A activity and therefore prior studies control for the impact of interstate or intrastate M&As (Becher, 2000; Becher and Campbell II, 2005; Brealey et al., 2019; DeLong, 2001; Goetz, 2018; Gupta and Misra, 2007; Kohers et al., 2000; Meslier et al., 2016). In this context, intrastate is a binary variable which takes the value of one when both bidders and targets are from the same U.S. state and zero otherwise. Moreover, the impact of industry-focused deals or industry-diversifying deals constitute a control variable for the performance upon M&A announcements (Barbopoulos et al., 2020; Phan, 2014). The industry-focused dummy takes the value of one when both acquirers and targets share the same two-digit SIC code, and zero otherwise.

The target's public status is also examined as a determinant for the acquirer's shareholder wealth. There is a consensus from previous studies that there are negative or at best zero acquirer's CARs upon the announcement of the acquisition of public targets (Alexandridis et al., 2017; Faccio et al., 2006; Fuller et al., 2002; Leledakis et al., 2021; Moeller et al., 2004). In particular, according to Fuller et al. (2002)

[16] see Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994.

acquirers of private or subsidiaries are associated with value creations whereas acquirers of public targets are associated with value losses. Considering the listing effect upon M&As, Faccio et al. (2006) using a sample EU acquirers over the period 1996-2001, found that acquirers of private targets earned significantly positive CARs whereas acquirers of listed targets presented negative but insignificant CARS. Fuller et al (2002) argued that one possible interpretation for the negative association between acquirer's CARs and the acquisition of public targets is that the large targets (i.e. listed targets) have stronger negotiating strength which in turn leads them to achieve higher gains relative to the acquirers. Furthermore, the differences in acquirer's CARs may be attributed to the differences either in the proportion of gains or in the proportion of the synergies that derived from the acquisition of listed or non-listed targets. Alternative, the "liquidity effect" can explain the negative association between acquirer's CARs and acquisition of public targets. Specifically, acquirers of private or subsidiary targets buy assets under the conditions of an "illiquid market" which creates discounts to the target's asset valuations and therefore gains for bidding firms (Fuller et al., 2002). To control for the target's listing status, the variable "Public Targets" is included in the regression analysis. "Public targets" is a dummy variable that takes the value of one for the acquisition of public targets and zero otherwise. The descriptive statistics for the bank-specific and the deal-specific variables are presented in the Table 8.

The results presented in the Table 8 show that on average the Return on Assets ratio is equal to 0.98% whereas the median ROA is equal to 1.00%. The reserves for loan losses as percentage of total loans is 1.45% with a standard deviation of 0.73%. Acquirers have high levels of leverage of about 158.3% on average over the entire period. This ratio also captures a high level of standard deviation (141.2%). Total loans, on average for the entire period, account for the 65% of the banks' total assets, suggesting that large proportion of bank assets is distributed to loans. With respect to the growth opportunities, measured by the ratio of price to book value, the results show that mean PTBV ratio equals to 1.71 over the period 1986-2020. The ratio of deal value to the market value of acquirer, on average, is 20.3% with a standard deviation of 25.4%, indicating that an average bank involves in acquisitions with a deal value that represents the 20.3% of its market capitalization. Furthermore, the sample statistics show that acquirers pay bid premiums that on average are 41.54% of the target's stock price before the announcement, whereas an average bank M&A needs about 167 days after the initial announcement in order to be completed.

Table 8. Descriptive Statistics

Variable	Definition	N	Mean	Q1	Median	Q3	Std. Dev.
Total Assets	Natural logarithm of acquirers' total assets at year-end (31/12) preceding the deal announcement	2914	22.043	20.933	21.960	22.986	1.547
AGE	Natural logarithm for the number of days between the date of the banks' first record and the announcement date.	3107	8.201	7.766	8.482	8.905	0.973
Return on Assets (%)	Ratio of ROA at year-end (31/12) preceding the deal announcement	2902	0.981	0.770	1.004	1.214	0.404
Reserve for Loan Losses % Total Loans	Ratio of reserve for loan losses to total loans at year-end (31/12) preceding the deal announcement	2888	1.458	1.060	1.330	1.660	0.734
Total Debt % Common Equity	Ratio of total debt to common equity at year-end (31/12) preceding the deal announcement	2907	158.278	59.410	116.900	208.220	141.153
Total Loans % Total Assets	Ratio of total loans to total assets at year-end (31/12) preceding the deal announcement	2808	64.950	59.280	65.860	71.698	10.276
Price-to-Book	Ratio of Price-to-Book value at year-end (31/12) preceding the deal announcement	2877	1.716	1.220	1.550	2.060	1.948
Relative Deal Size	Ratio of deal value to acquirers' market value twenty-one days prior to the announcement date	3107	0.203	0.046	0.108	0.253	0.254
Stock-only financed deals	Dummy variable that is assigned the value of one for stock-only financed acquisitions and zero otherwise.	3107	0.427	0	0	1	0.495
Intrastate deals	Dummy variable that is assigned the value of one for intrastate deals and zero otherwise.	3107	0.565	0	1	1	0.496
Industry focused deals	Dummy variable that is assigned the value of one for industry focused deals (namely for deals that are announced by acquirers and targets with the same two-digit SIC code) and zero otherwise	3107	0.829	1	1	1	0.376
Public Targets	Dummy variable that is assigned the value of one if the target is listed and zero otherwise	3107	0.495	0	0	1	0.500
Days to Complete	Number of days between the announcement date and the effective (completion) date	3107	166.96	123	158	201	77.27
Bid premium	Excess of the offer price over the target's stock price four weeks prior to the deal announcement	1213	41.536	18.360	34.460	56.680	36.615

Note: This table presents the descriptive statistics for the variables used in the empirical analysis. All variables are winsorized at the 1% and 99% levels.

3.6.3. Addressing concerns for multicollinearity

In multivariate analyses, multicollinearity constitutes a major concern that can be driven by the correlation among the exogenous variables. This section presents the correlation matrix and the statistics for collinearity. In line with prior studies (Baele et al., 2015; Barbopoulos et al., 2020; Danbolt et al., 2015; Mertzanis, 2019; Nguyen and Vo, 2020), a correlation matrix is used to address concerns for multicollinearity. Table 9 reports the Pearson pair-wise correlations for the covariates variables used in the multivariate analysis.

Table 9. Correlation matrix for the independent variables used in the multivariate analyses

	Total Assets	AGE	Return on Assets	Reserve for Loan Losses % Total Loans	Total Debt % Common Equity	Total Loans % Total Assets	Price-to-Book	Relative Deal Size	Stock-only financed deals	Intrastate deals	Industry focused deals	Public Targets
Total Assets	1											
AGE	0.544[a]	1										
Return on Assets	0.150[a]	0.187[a]	1									
Reserve for Loan Losses % Total Loans	0.216[a]	0.168[a]	-0.010	1								
Total Debt % Common Equity	0.360[a]	0.106[a]	-0.160[a]	0.046[b]	1							
Total Loans % Total Assets	-0.094[a]	0.004	0.034[c]	-0.258[a]	-0.118[a]	1						
Price-to-Book	0.051[a]	0.042[b]	0.155[a]	0.001	0.038[b]	0.004	1					
Relative Deal Size	-0.258[a]	-0.220[a]	-0.156[a]	-0.067[a]	-0.020	0.071[a]	-0.114[a]	1				
Stock-only financed deals	0.081[a]	0.079[a]	0.074[a]	0.052[a]	-0.007	-0.026	0.086[a]	0.030[c]	1			
Intrastate deals	-0.397[a]	-0.255[a]	-0.083[a]	-0.064[a]	-0.152[a]	0.008	-0.016	0.127[a]	-0.031[c]	1		
Industry focused deals	-0.080[a]	-0.025	0.012	-0.018	-0.079[a]	-0.027	-0.024	0.036[b]	0.102[a]	0.059[a]	1	
Public Targets	0.166[a]	0.146[a]	0.046[b]	-0.004	0.078[a]	0.061[a]	-0.012	0.207[a]	0.169[a]	-0.026	0.096[a]	1

Note: This table reports the results of the pairwise Pearson correlation for the independent variables used in the multivariate analyses. The superscripts a, b and c denote significance at 1%, 5% and 10% levels, respectively.

The results presented in the Table 9 suggest that there is no strong correlation among the independent variables confirming no linear dependence among the variables used in the empirical models (Alcalde and Powell, 2022; Gulamhussen et al., 2016). In particular, the largest correlation coefficient equals to r=+0.544 <0.70 and is presented for the correlation between AGE and Total Assets, suggesting that large banks are more likely to have high age. The rest of the correlation coefficients have an absolute value below the 0.4 value. Using a more conservative threshold (Bennouri et al., 2018; Bitar and Tarazi, 2019) for the pair-wise correlations, all coefficient values are below the 0.6 threshold. The results alleviate concerns for multi-collinearity and therefore the independent variables can be used in the multivariate analyses.

Although the results derived from the correlation matrix suggest that multi-collinearity is not a problem for multivariate analyses, to further assess the existence of collinearity, table 10 reports the Variance Inflation Factors (VIFs).

Table 10. Variance Inflation Factors (VIFs)

Variable	Collinearity Statistics	
	Variance Inflation Factor (VIF)	Tolerance
Total Assets	2.02	0.50
AGE	1.53	0.66
Return on Assets	1.40	0.71
Reserve for Loan Losses % Total Loans	1.33	0.75
Total Debt % Common Equity	1.28	0.78
Total Loans % Total Assets	1.20	0.83
Price-to-Book	1.20	0.84
Relative Deal Size	1.18	0.84
Stock-only financed deals	1.14	0.88
Intrastate deals	1.10	0.91
Industry focused deals	1.07	0.93
Public Targets	1.04	0.96
Mean VIF	1.29	

Note: This table reports the collinearity statistics using the Variance Inflation Factors (VIFs). The VIFs derived from a regression model with dependent variable the acquirer's CARs and independent variables those variables that included in this table.

The results presented in the Table 10 show that the maximum Variance Inflation Factor (VIF=2.02) is presented for the variable of Total Assets. In particular, VIFs range from 1.05 to 2.02. Furthermore, all of the VIF values are considerably lower than the threshold of ten (Belsley et al., 2005; Bennouri et al., 2018; Bitar and Tarazi, 2019; Bose et al., 2021; Deng and Yang, 2015; Gao et al., 2019; Ho et al., 2020; Kanungo, 2021). Even better, all of the VIFs are below the threshold of five that is proposed by several studies (Alauddin and Nghiemb, 2010; Gelman and Kliger, 2021) or the more strict threshold of 2.5 that is often suggested as a even more conservative rule of thumb (Battisti et al., 2022; Deutscher et al., 2016; Mahmoudian et al., 2021).

With respect to the VIFs, the mean VIF equals to 1.29 whereas the tolerance values are greater than the 0.10 level (Alcalde and Powell, 2022) or the more conservative level of 0.40 (Liang, 2016). Ultimately, the results derived from the Tables 9 and 10 confirm that multicollinearity is not an issue for the multivariate analyses.

3.6.4. Cross-sectional analysis for the impact of EPU on other M&A outcomes

To evaluate the impact of Economic Policy Uncertainty (EPU) on M&A outcomes, multiple cross-sectional models are applied. In particular, this thesis investigates the effect of EPU (measured both by BBD overall index and by categorical indices) on bid premiums, selection of stock-financed deals, and time to completion.

Takeover premiums reflect the valuation of targets by the bidding firms and therefore high bid premiums may indicate the existence of target overvaluation (Perafán-Peña et al., 2022). When information relative to takeover premiums is available before the M&A announcement, then there is an effect on both the success of M&As and the corresponding market reaction (Kanungo, 2021). Moeller et al.(2004) provided evidence that bid premiums were associated with the acquirer's size, whereas Hagendorff et al. (2012), using a sample of bank M&As in European countries, found that target's characteristics were associated with bid premiums. Moreover, they provided evidence that higher levels of both deposit insurance and regulatory strength were associated with lower bid premiums (Hagendorff et al., 2012). To analyze the effect of EPU on Bid Premiums the regression model in Eq. 21 is applied.

$$Bid\ Premium_i = a + \beta_i EPU_i + \sum_{j=1}^{k} \lambda_j X_{ij} + \varepsilon_i \qquad i = 1 \ldots N \qquad (21)$$

Where, EPU is index of Economic Policy Uncertainty for the year preceding the deal announcement and $\beta_i$is the corresponding coefficient. The three-month mean weighted BBD index in year prior to the announcement. The regression model in Eq. 21 is applied to investigate the impact of EPU on offered premiums after controlling for a vector X of k control variables.

According to prior studies (Alexandridis et al., 2013; de La Bruslerie, 2013; Gregoriou et al., 2021; Humphery-Jenner and Powell, 2011; Jost et al., 2022; Levi et al., 2014; Perafán-Peña et al., 2022), bid premiums are estimated as the transaction value divided by the targets' market capitalization measured four weeks before the announcement minus one.

The selection of the method of payment is also considered as an important characteristic of M&As that on the one hand affect the acquisition gains and on the other hand is affected by firm-specific, deal-specific and macro-related characteristics. Amihud et al. (1990) argued that the propensity of stock-financed

deals was negatively associated with insider ownership; however Martin (1996) provided evidence that this negative relationship held only over middle ranges of acquirer's ownership. Huang et al. (2016) showed that acquirer's size, acquirer's tangibility, the acquisition of private targets, the acquisition of subsidiary targets, hostile deals, and competing offers were positively associated with the selection of cash-only financed deals, whereas acquirer's stock returns, relative deal size, intra-industry and high-tech deals were negatively associated with the selection of cash-financed deals. Considering the choice of method of payment, Golubov et al. (2016) showed that the acquirer's size, the acquirer's book-to-market ratio, and the relative deal size were positively associated with the propensity of stock-financed deals, whereas the acquirer's leverage, the acquirer's cash holdings, and the acquirer's cash flow to equity ratios were negatively associated with the equity issuance via selection of stock-only financed deals. Loureiro and Silva (2021) showed that acquirer's market-to-book ratio, acquirer's ROA, and acquirer's leverage were negatively associated with the selection of stock-only financed deals whereas the relative deal size was positively associated with the probability of selection stock-financed acquisitions.

The level of policy-related economic uncertainty may also affect the acquirer's financial constraints and its ability for external financing. In this context, the Economic Policy Uncertainty (EPU) may influence the choice of payment upon M&As (Nguyen and Phan, 2017). To analyze the effect of EPU on the selection of stock-only financed M&As, the Probit model as shown in Eq. 22 is applied.

$$STOCK = a + \beta_i EPU_i + \sum_{j=1}^{k} \lambda_j X_{ij} + \varepsilon_i \qquad i = 1 \ldots N \qquad (22)$$

Where, EPU is index of Economic Policy Uncertainty for the year preceding the deal announcement and $\beta_i$is the corresponding coefficient. The three-month mean weighted BBD index in year prior to the announcement. The Probit model in Eq. 22 is applied to investigate the impact of EPU on the selection of stock-financed deals after controlling for a vector X of k control variables. STOCK is binary variable that is assigned the value of one for stock-only financed M&As, and zero otherwise.

The period between the announcement and the completion (effective) date reflects the time that is spend on due diligence processes[17] (Wan et al., 2021) as well as the level of complexity for a specified deal (Bi and Wang, 2018). However, a prolonged time to completion can also be interpreted as the uncertainty related to the completion of the deal which also implies higher costs both for bidders and targets (Bick et al., 2017; Fidrmuc et al., 2018). In this context, completion delays, due to the uncertainty,

[17] However, the negotiation processes can be start privately between the involved parties well before the M&A official announcement (Calcagno et al., 2021).

can be also associated with value destructions upon M&As (Gao and Bao, 2022). Therefore, policy-related economic uncertainty may affect the duration of deal completion (Bhagwat et al., 2021; Gregoriou et al., 2021; Nguyen and Phan, 2017). To investigate whether Economic Policy Uncertainty (EPU) affects the time to completion, the regression model as shown in Eq. 23 is applied.

$$Days = a + \beta_i EPU_i + \sum_{j=1}^{k} \lambda_j X_{ij} + \varepsilon_i \qquad i = 1 \ldots N \qquad (23)$$

Where, EPU is index of Economic Policy Uncertainty for the year preceding the deal announcement and $\beta_i$is the corresponding coefficient. The three-month mean weighted BBD index in year prior to the announcement. The regression model in Eq. 23 is applied to investigate the impact of EPU on the time to completion after controlling for a vector X of k control variables. “Days” is a numeric variable that captures the number of days between the announcement and the completion (effective) date.

Chapter 4: Short-run and Long-run performance of M&As

This chapter presents the results derived from the estimation of Average Abnormal Returns (AARs) and Cumulative Abnormal Returns (CARs) using alternative asset pricing models. Given that short event windows (e.g. three-day event window) are mainly used to capture the market reaction upon M&A announcements, they may be too short in order to capture the full effect of M&A announcements in the banking sector. Daily AARs are presented for 41 days (-20, 20) centered on the bank M&A announcements, while CARs are calculated over various event-windows surrounding the deal announcements. Moreover, results for the acquirer's long-run performance are also presented.

4.1. Market-adjusted model

The market-adjusted model is used to estimate the Average Abnormal Returns (AARs) and the Cumulative Average Abnormal Returns (CAARs) for the 41-day event window surrounding the deal announcement. To estimate the abnormal returns, the CRSP NYSE/AMEX/NASDAQ value-weighted index is used as market benchmark. The results are presented in table 11.

The results presented in table 11 derived from the market-adjusted model and indicate the existence of insignificant average abnormal returns (AARs) over several days prior to the bank M&A announcements. The AARs are significantly positive (+0.04%) upon 14 days prior to the announcements, whereas they are significantly negative (-0.04%) upon 9 days prior to the announcement day. These results mainly indicate insignificant valuation effects which implies that information regarding the M&As is not incorporated into the asset prices prior to the official announcement of the deals.

On the contrary, on the announcement day (day 0) there is statistically significant and negative abnormal return that on average is equal to -0.27%. The negative market reaction upon the announcement date is statistically significant at the 1% level using alternative tests (parametric and non-parametric) for assessing the significance of AARs. The negative AARs are still present upon the day after the M&A announcements (day 1) and equal to -0.07%, however they became statistically significant and positive (+0.11%) upon the second day after the official M&A announcement (day 2). The positive abnormal return upon the second day implies that the value destruction upon bank M&As is marginally reversed on the second day after the announcement.

Table 11. Daily Average Abnormal Returns (AAR) estimated using the market-adjusted model over the period 1986-2020 as shown in Eq. 1

t	AAR	t-test	BMP	Patell-test	Corrado	Sign-test
-20	-0.01%	-0.191	-0.196	-0.195	-0.249	-0.493
-19	0.03%	0.925	1.344	1.323	1.582	1.696[c]
-18	0.04%	1.101	0.275	0.285	-0.311	-0.098
-17	-0.02%	-0.488	-0.242	-0.252	-0.429	0.548
-16	0.01%	0.269	0.609	0.589	0.059	-0.206
-15	0.02%	0.493	-0.135	-0.132	-0.360	-0.206
-14	0.04%	1.148	1.942[c]	2.077[b]	0.892	0.225
-13	0.01%	0.191	-0.549	-0.590	-0.560	-0.565
-12	-0.03%	-0.841	-1.073	-1.129	-1.146	-1.103
-11	-0.04%	-1.167	-0.927	-0.928	-0.762	-0.529
-10	-0.02%	-0.466	-0.380	-0.373	-0.751	-0.313
-9	-0.04%	-1.063	-1.179	-1.208	-1.935[c]	-2.108[b]
-8	0.03%	0.805	0.162	0.169	-0.078	-0.601
-7	-0.04%	-1.119	-0.807	-0.935	-0.618	-0.242
-6	0.04%	1.196	0.667	0.667	0.640	1.266
-5	0.00%	0.050	0.106	0.109	-1.124	-1.426
-4	-0.02%	-0.439	-0.548	-0.566	-0.754	-1.211
-3	-0.03%	-0.901	-0.880	-0.877	-0.439	0.117
-2	0.01%	0.347	-0.552	-0.617	-1.064	-0.421
-1	0.02%	0.492	0.205	0.221	0.845	0.835
0	-0.27%	-7.222[a]	-6.364[a]	-11.948[a]	-6.314[a]	-4.405[a]
1	-0.07%	-1.969[c]	-1.865[c]	-2.733[a]	-2.078[b]	-1.175
2	0.11%	2.866[a]	3.234[a]	3.670[a]	2.738[a]	2.665[a]
3	-0.01%	-0.177	-0.183	-0.188	-0.002	-0.062
4	0.02%	0.605	0.186	0.212	0.592	1.158
5	0.02%	0.517	0.375	0.380	0.532	0.404
6	-0.01%	-0.393	-0.946	-0.983	-0.682	-0.421
7	-0.02%	-0.524	-0.185	-0.193	-0.267	-0.206
8	0.05%	1.386	1.115	1.132	0.339	-0.242
9	0.00%	0.131	-0.146	-0.153	0.118	0.010
10	-0.10%	-2.744[a]	-2.782[a]	-2.837[a]	-2.187[b]	-1.462
11	0.08%	2.082[b]	1.908[c]	1.929[c]	1.161	1.696[c]
12	-0.02%	-0.506	-0.633	-0.841	-0.182	-0.421
13	-0.07%	-1.967[c]	-1.621	-1.639	-1.426	-0.816
14	0.01%	0.179	0.187	0.186	-0.656	-0.529
15	0.00%	-0.129	-0.485	-0.507	-0.792	-1.282
16	-0.03%	-0.793	-1.209	-1.211	-0.753	-0.206
17	-0.01%	-0.180	-0.415	-0.450	-0.402	-0.852
18	0.03%	0.811	0.354	0.355	0.210	0.656
19	-0.02%	-0.525	-0.186	-0.221	-0.477	-0.852
20	0.02%	0.464	0.019	0.019	-1.017	-1.821[c]

Note: This table reports the daily acquirer's Average Abnormal Returns (AARs) estimated using the market adjusted model with the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark. AARs are estimated over the entire period (1986-2020) for 41days centered on the announcement date (day 0). The statistical significance of AARs is assessed using five alternative tests and specifically using parametric tests (t-test, BMP-test, and Patell-test) and non-parametric tests (Corrado-test and Sign-test). The superscripts a, b and c denote the statistical significance at 1%, 5% and 10% levels, respectively.

Prior literature supports the existence of negative autocorrelation for individual stock returns in the short-run which can explain the return reversals (Avramov et al., 2006; Jacobs, 2015; Johnson, 2016; So and Wang, 2014). The finding of reversal of the earlier abnormal returns for acquiring firms that is presented two days after the initial announcement is also supported by Fatemi et al. (2017) who analyzed the gains from M&As in Japan. Andriosopoulos et al. (2016), using a sample of M&As in the U.K. found that the significant, but short-lived, market reaction upon the announcement date was followed by reversals in the 20-day post announcement period.

Therefore, the positive abnormal return on the second day after the official announcement may constitute a price correction to the initial negative market (over)reaction. Collett, (2004) states that pre-announcement abnormal returns might show trading activity from well informed investors, while post-announcement drifts might suggest the existence of inefficient markets. Market corrections in post-announcement periods can be attributed to the existence of two types of investors: informed investors and followers. Using a sample of Friday earnings announcements, Dellavigna and Pollet (2009) argued that investor inattention leads to less immediate reaction and more delayed response. However, with respect to the M&A announcements, Reyes (2018) demonstrates that investor attention to merging firms, which is maximized on the announcement day and remains high for few days after the announcement, is associated with abnormal returns. Given that bank M&As generally attract the attention of investors, the existence of post-announcement significant returns can also be attributed to the level of investor attention that is paid to such the events from their announcement and afterwards.

According to the rest of the results over the post-announcement period, AARs are mainly insignificantly different from zero and this result is confirmed using the five alternative tests of significance. However, AARs are statistically significant and negative (-0.10%) upon day 10 after the M&A announcements using four out of five tests. This significantly negative abnormal return might show a delayed reaction (e.g. market response by followers) to the announcement of bank M&As. Moreover, AARs are positive upon both the day 11 and the day 20 and equal to 0.08% and 0.02%, respectively. These post-announcement significant positive abnormal returns, which occurred several days after the official announcement, might also show a reversal due to the initial overreaction.

Table 12 reports the cumulative abnormal returns (CARs) over various event windows surrounding the deal announcements. Specifically, two pre-announcement event windows are used (i.e. (-5,-1) and (-2,0) to capture the valuation effects and the potential information leakage prior to the bank M&A announcement, five event-windows centered on the announcement day are used (i.e. (-5, 5), (-3, 3), (-2, 2) and (-1,1)) to capture the valuation effects of M&As whereas three post-announcement event windows are used (i.e. (0,1), (0,2) and (1,5)) to capture information

incorporated to asset prices after the deal announcements. The statistically significance of CARs is assessed using two parametric tests (BMP-test and Patell-test) and two non-parametric tests (Corrado and Sign-test) for mean and median CARs, respectively.

Table 12. Cumulative Abnormal Returns (CARs) estimated using the market-adjusted model for the entire period 1986-2020 as shown in Eq. 1

Event Window	Mean	Median	Std. Dev	%Pos	t-test	BMP	Patell-test	Corrado	Sign-test
Pre-announcement event windows									
[-5, -1]	-0.02	-0.16	3.79	47.4	-0.200	-0.721	-1.007	-1.350	-1.892[c]
[-2, 0]	-0.23	-0.35	4.31	44.8	-3.659[a]	-4.514[a]	-7.359[a]	-3.810[a]	-4.727[a]
Announcement event windows									
[-20, 20]	-0.29	-0.71	9.71	46.6	-0.907	-1.847[c]	-3.291[a]	-2.830[a]	-2.790[a]
[-5, 5]	-0.21	-0.39	6.18	46.8	-1.735[c]	-3.110[a]	-5.502[a]	-2.239[b]	-2.503[b]
[-3, 3]	-0.24	-0.29	5.59	46.3	-2.460[b]	-3.937[a]	-6.956[a]	-2.464[b]	-3.077[a]
[-2, 2]	-0.20	-0.35	5.24	45.9	-2.435[b]	-3.904[a]	-7.084[a]	-2.672[a]	-3.507[a]
[-1, 1]	-0.32	-0.32	4.68	45.4	-4.987[a]	-5.303[a]	-9.806[a]	-4.395[a]	-4.117[a]
Post-announcement event windows									
[0, 1]	-0.34	-0.34	4.20	44.7	-6.455[a]	-6.488[a]	-13.881[a]	-5.950[a]	-4.835[a]
[0, 2]	-0.23	-0.29	4.66	45.7	-3.626[a]	-5.230[a]	-11.762[a]	-3.303[a]	-3.723[a]
[1, 5]	0.07	-0.06	4.32	49.0	0.817	0.016	0.029	0.630	-0.098

Note: This table reports the acquirer's Cumulative Abnormal Returns (CARs) for alternative event-windows surrounding the M&A announcements during the entire period 1986-2020. In particular, two pre-announcement windows (i.e. (-5,-1), and (-2,0), five announcement event windows (i.e. (-20, 20), (-5, 5), (-3, 3), (-2, 2), and (-1, 1)) and three post-announcement event windows (i.e. (0, 1), (0, 2), and (1, 5)) are presented. To measure the CARs, the market-adjusted model with the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark is used. The mean (%), the median (%), the standard deviation (%) of CARs and the percentage of positive CARs (%) across each event-window are presented. The statistical significance of CARs is assessed using three parametric tests (t-test, BMP-test, and Patell-test) and two non-parametric tests (Corrado-test and Sign-test). The superscripts a, b and c denote the statistical significance at 1%, 5% and 10% levels, respectively.

The results reported in table 12 indicate that the M&As are value destroying for U.S. banks over the entire period 1986-2020. Specifically, both the three-day average CARs and the three-day median CARs centered on the announcement date (-1, 1) are equal to -0.32% and they are statistically significant at the 1% level using the four tests of statistical significance. The standard deviation for three-day CARs is 4.68% indicating the volatility levels with respect to the excess returns upon the announcement of bank M&As. CARs are also statistically significant and negative over the five-day (-2,2), the seven-day (-3,3), the 11-day (-5, 5) as well as the 41-day (-20, 20) event windows surrounding the bank M&A announcements and vary from -0.20% to -0.29.

In the pre-announcement period, the CAR over the (-5,-1) is marginally negative (-0.02) but lucks robust statistical significance. Therefore, there is no evidence for information leakage prior to the official announcement of the M&As. Moreover, in

the (-2,0) window CARs are significant and equal to -0.23%. In the post-announcement period, CARs for two-days (0, 1) and three-days (0,2) begging on the announcement date are significantly negative and equal to -0.34% and -0.23%, respectively. Furthermore, the (1,5) CAR is insignificant indicating that the information is incorporated to asset prices immediately upon the bank M&A announcements. Notwithstanding that for the whole sample average (median) announcement CARs are significantly negative suggesting value destruction upon bank M&As, positive market reaction is presented for the 45.4% of the M&As in the three-day event window (-1,1). Moreover, across all the applied event windows, the percentages of positive excess returns vary for 44.8% to 49%. Overall, the above results provide robust evidence that bank M&As destroy shareholder wealth. Figure 1 presents the Average Abnormal Returns (AARs) and the Cumulative Average Abnormal Returns (CAARs) in the 41-day window (-20, +20) surrounding the M&A announcements using the market adjusted model.

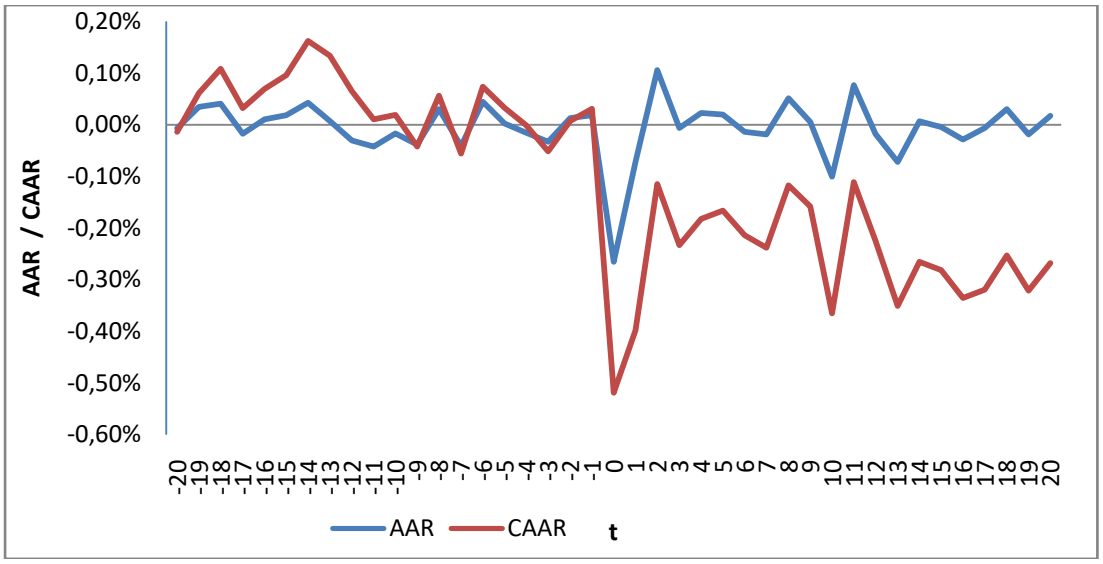

Figure 1. Daily Average Abnormal Returns (AAR) and Cumulative Average Abnormal Returns (CAAR) estimated using the market adjusted model over the period 1986-2020.

Note: This figure presents both the Average Abnormal Returns (AAR) and the Cumulative Average Abnormal Returns (CAAR) for bank acquirers over the 41-day event window surrounding the announcement date (day 0) during the entire period 1986-2020. AARs (blue line) and CAARs (red line) are estimated with the market-adjusted model using the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark.

Figure 1 shows that the stock market negatively reacts to the bank M&A announcements. According to the AAR line (blue), AARs significantly drop below the zero line upon the official M&A announcement indicating that bank M&As are value destroying. Specifically, on the announcement day (day 0) AARs equal to -0.27% whereas CAARs over the 41-day window equal to -0.29%.

4.2. Market Model

Table 13 presents the daily abnormal returns and the tests for assessing the statistical significance upon bank M&A announcements using the market model.

Table 13. Daily Average Abnormal Returns (AAR) estimated using the market model over the period 1986-2020 as shown in Eq. 4

t	AAR	t-test	BMP	Patell-test	Corrado	Sign-test
-20	-0.02%	-0.476	-0.323	-0.326	-0.382	-0.374
-19	0.02%	0.581	1.118	1.114	1.447	2.105[b]
-18	0.04%	1.103	0.377	0.393	0.100	0.560
-17	-0.03%	-0.875	-0.486	-0.516	-0.590	-0.374
-16	-0.01%	-0.392	0.091	0.088	-0.141	-0.410
-15	0.01%	0.170	-0.457	-0.454	-0.393	-0.697
-14	0.02%	0.694	1.598	1.730[c]	0.584	0.309
-13	0.02%	0.490	-0.189	-0.206	0.136	0.345
-12	-0.02%	-0.517	-0.702	-0.749	-0.645	-0.230
-11	-0.05%	-1.380	-1.241	-1.265	-0.631	-0.877
-10	-0.03%	-0.912	-0.838	-0.837	-1.103	-0.446
-9	-0.04%	-1.179	-1.291	-1.342	-1.812[c]	-1.739[c]
-8	0.02%	0.474	-0.312	-0.326	-0.086	0.488
-7	-0.06%	-1.649	-0.862	-1.022	-0.644	-0.769
-6	0.02%	0.648	0.089	0.090	0.221	0.309
-5	-0.01%	-0.364	-0.321	-0.335	-1.357	-0.841
-4	-0.03%	-0.887	-0.827	-0.850	-0.837	-1.236
-3	-0.05%	-1.331	-1.289	-1.315	-0.930	-0.230
-2	0.00%	-0.070	-1.025	-1.141	-1.183	-0.338
-1	0.00%	-0.039	-0.410	-0.447	0.521	1.063
0	-0.27%	-7.598[a]	-6.416[a]	-12.333[a]	-6.297[a]	-3.715[a]
1	-0.08%	-2.356[b]	-2.170[b]	-3.287[a]	-2.050[b]	0.021
2	0.10%	2.736[a]	3.158[a]	3.710[a]	2.698[a]	2.859[a]
3	-0.02%	-0.675	-0.441	-0.460	-0.019	0.488
4	0.03%	0.880	0.379	0.443	0.931	1.961[c]
5	0.01%	0.207	0.298	0.307	0.505	1.243
6	-0.04%	-1.008	-1.532	-1.608	-0.933	0.273
7	-0.03%	-0.789	-0.454	-0.485	-0.233	-0.087
8	0.04%	1.251	1.011	1.060	0.163	-0.051
9	-0.02%	-0.536	-0.890	-0.954	-0.546	-0.194
10	-0.12%	-3.353[a]	-3.099[a]	-3.231[a]	-2.890[a]	-2.422[b]
11	0.06%	1.763[c]	1.767[c]	1.825[c]	1.552	2.644[a]
12	-0.06%	-1.668[c]	-1.437	-1.974[b]	-1.396	-1.021
13	-0.09%	-2.572[b]	-2.236[b]	-2.322[b]	-1.875[c]	-1.380
14	0.00%	-0.033	-0.145	-0.149	-0.565	-0.266
15	-0.01%	-0.142	-0.456	-0.488	-0.685	-0.625
16	-0.04%	-1.040	-1.447	-1.441	-0.623	0.201
17	-0.02%	-0.534	-0.843	-0.932	-0.391	0.273
18	0.02%	0.502	0.002	0.002	0.228	0.955
19	-0.02%	-0.605	0.335	0.532	-0.453	-0.410
20	-0.01%	-0.288	-0.552	-0.583	-0.976	-1.667[c]

Note: This table reports the daily acquirer's Average Abnormal Returns (AARs) estimated using the market model with the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark. AARs are estimated over the entire period (1986-2020) for 41days centered on the announcement date (day 0). The statistical significance of AARs is assessed using five alternative tests and specifically using parametric tests (t-test, BMP-test, and Patell-test) and non-parametric tests (Corrado-test and Sign-test). The superscripts a, b and c denote the statistical significance at 1%, 5% and 10% levels, respectively.

Using the market model with the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark, the results in Table 13 show statistically significant and negative market reaction upon the announcement of bank M&As. Specifically, on the announcement date (day 0) AARs are equal to -0.27% and are statistically significant at the 1% level (using five alternative tests of statistically significance) suggesting that bank M&As destroy shareholder wealth upon the announcement date. Furthermore, prior to the M&A announcements there is no robust evidence that AARs are statistically significantly different from zero[18]. The insignificant AARs over the pre-announcement period suggest that stock markets react to M&As only after its announcements.

Over the post-announcement period, AARs are significantly negative (-0.08%) on the first day after the announcement (day 1) but they are significantly positive (+0.10%) on the second day after the announcement (day 2). Moreover, from 10 to 13 days after the M&A announcements there is evidence for significantly different from zero AARs which can be attributed to delayed market response or to price corrections. Table 14 presents the cumulative abnormal returns (CARs) estimated using the market model over various event windows surrounding the deal announcements.

Table 14. Cumulative Abnormal Returns (CARs) estimated using the market model for the entire period 1986-2020 as shown in Eq. 4

Event Window	Mean	Median	Std. Dev	%Pos	t-test	BMP	Patell-test	Corrado	Sign-test
Pre-announcement event windows									
[-5, -1]	-0.10	-0.18	3.67	46.7	-1.205	-1.735[c]	-2.465[b]	-2.051[b]	-0.913
[-2, 0]	-0.27	-0.32	4.25	43.1	-4.457[a]	-5.096[a]	-8.577[a]	-4.128[a]	-4.900[a]
Announcement event windows									
[-20, 20]	-0.77	-1.01	10.10	46.0	-2.559[b]	-3.180[a]	-6.167[a]	-3.341[a]	-1.739[c]
[-5, 5]	-0.34	-0.38	6.17	46.1	-2.849[a]	-4.011[a]	-7.352[a]	-2.559[b]	-1.631
[-3, 3]	-0.33	-0.41	5.51	45.3	-3.528[a]	-4.786[a]	-8.675[a]	-2.851[a]	-2.422[b]
[-2, 2]	-0.26	-0.37	5.19	44.9	-3.280[a]	-4.555[a]	-8.562[a]	-2.911[a]	-2.889[a]
[-1, 1]	-0.35	-0.34	4.61	44.3	-5.780[a]	-5.819[a]	-11.065[a]	-4.590[a]	-3.571[a]
Post-announcement event window									
[0, 1]	-0.35	-0.31	4.15	43.2	-7.053[a]	-6.664[a]	-14.657[a]	-6.012[a]	-4.864[a]
[0, 2]	-0.26	-0.30	4.60	44.7	-4.175[a]	-5.402[a]	-12.515[a]	-3.329[a]	-3.176[a]
[1, 5]	0.03	-0.11	4.23	48.1	0.354	-0.302	-0.571	0.830	0.704

Note: This table reports the acquirer's Cumulative Abnormal Returns (CARs) for alternative event-windows surrounding the M&A announcements during the entire period 1986-2020. In particular, two pre-announcement windows (i.e. (-5,-1), and (-2,0), five announcement event windows (i.e. (-20, 20), (-5, 5), (-3, 3), (-2, 2), and (-1, 1)) and three post-announcement event windows (i.e. (0, 1), (0, 2), and (1, 5)) are presented. To measure the CARs, the market model with the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark is used. The mean (%), the median (%), the standard deviation (%) of CARs and the percentage of positive CARs (%) across each event-window are presented. The statistical significance of CARs is assessed using three parametric tests (t-test, BMP-test, and Patell-test) and two non-parametric tests (Corrado-test and Sign-test). The superscripts a, b and c denote the statistical significance at 1%, 5% and 10% levels, respectively.

[18] Results from sign-test indicate that AARs on 19 days prior to the announcements equal to 0.02% (at 5% level), whereas Corrado and Sign-test indicate negative AARs that equal to -0.04% (at 10% level) on 9 days prior to the announcement. However, using both the BMP and the Patell-test the above results are not confirmed.

Results presented in the table 14 show that in the window of five days preceding the deal announcement (-5, -1), CARs equal to -0.10 and are statistically significant using the BMP, the Patell-test, and the Corrado-test, implying significantly negative reaction prior to the official M&A announcements. This result derived by the market model provides an indication of information leakage prior to the announcement given that CARs are significantly different from zero before the announcement date. Negative CARs that equal to -0.27% are also presented in the (-2, 0) window. With respect to the event windows centered on the announcement date, there is strong evidence of statistically significant and negative CARs surrounding the deal announcements regardless of the length of these windows. Three-day CARs (-1, +1) are significant at 1% level using five alternative and equal to -0.35%. Moreover, five-day CARs (-2 , +2) are equal to -0.26%, whereas longer event windows centered on the announcement day present higher magnitude of negative returns (e.g. CARs (-5, +5) equal to -0.34 and CARs (-20, +20) equal to -0.77%).

According to the results for the post-announcement event windows, statistically significant negative returns are also presented for two- and three-day CARs beginning at the announcement day. Specifically, shareholders experience losses that equal to -0.26% in the (0, +2) window. However, in windows starting after the announcement date, CARs (+1, +5) are insignificantly different from zero suggesting the M&A deals affect shareholder value immediately. Overall the results derived from the market model suggest that bank M&As in the U.S. over the period 1986-2020 destroy shareholder wealth given that acquiring banks experience significant losses surrounding the deal announcements. Figure 2 presents the Average Abnormal Returns (AARs) and the Cumulative Average Abnormal Returns (CAARs) in the 41-day window (-20, +20) surrounding the M&A announcements using the market model.

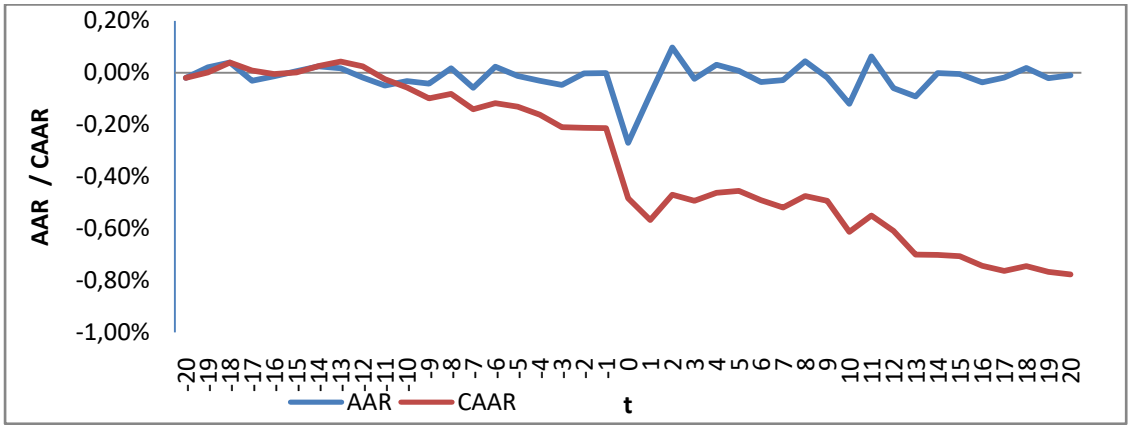

Figure 2. Daily Average Abnormal Returns (AAR) and Cumulative Average Abnormal Returns (CAAR) estimated using the market model over the period 1986-2020.

Note: This figure presents both the Average Abnormal Returns (AAR) and the Cumulative Average Abnormal Returns (CAAR) for bank acquirers over the 41-day event window surrounding the announcement date (day 0) during the entire period 1986-2020. AARs (blue line) and CAARs (red line) are estimated with the market model using the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark.

According to figure 2, market participants negatively react upon M&A announcements and AARs are about -0.27% on the announcement day (day 0). Blue line shows the drop in abnormal returns surrounding the announcement of bank M&As, while the red line presents the configuration of CARs over the days. CARs in the (-20, +20) window are negative and reach about -0.77%.

4.3. CAPM

Table 15 presents the daily average abnormal returns (AARs) for a 41-day event period from the CAPM. The results indicate the existence of negative but insignificant abnormal returns for several days prior to the announcements. However, upon 11, 9, 7, and 3-days before the announcement there is indication of negative daily AARs which are confirmed as statistically significant using some of the applied tests.

The results further demonstrate that M&A announcements are mainly incorporated into asset prices upon the announcement date. Specifically, on the announcement day (day 0), acquiring banks lose by about -0.28% and this result is statistically significance at the 1% level regardless the test of significance that is used. This negative reaction is still present on the first day after the announcement (day 1) given that AARs equal to -0.10% and are significant using four out of five applied tests. However, this negative initial reaction to bank M&A announcements is partially reversed on the second day after the announcement (day 2) and specifically AARs are significant (using five alternative tests) and positive (+0.08%).

The rest of the results over the post-announcement period indicate significant positive AARs upon the day 4 (+0.02%) and the day 11 (+0.05%) after the announcement, whilst significant negative AARs exist upon several days (from 6 to 20 days) after the announcement. Overall, bank M&As are associated with significant losses for shareholders over the first two days starting on the announcement day, while they are associated with reversals (positive abnormal returns) or delayed investor responses (negative abnormal returns) in short-run over the post-event period.

Table 15. Daily Average Abnormal Returns (AAR) estimated using the CAPM over the period 1986-2020 as shown in Eq. 5

t	AAR	t-test	BMP	Patell-test	Corrado	Sign-test
-20	-0.03%	-0.858	-0.798	-0.805	-0.356	-0.272
-19	0.01%	0.199	0.636	0.634	1.506	2.101[b]
-18	0.03%	0.722	-0.082	-0.086	0.115	0.483
-17	-0.04%	-1.257	-0.938	-0.995	-0.529	-0.200
-16	-0.03%	-0.774	-0.405	-0.391	-0.067	-0.380
-15	-0.01%	-0.211	-0.939	-0.933	-0.345	-0.704
-14	0.01%	0.312	1.155	1.250	0.614	0.662
-13	0.00%	0.109	-0.629	-0.686	0.150	0.087
-12	-0.03%	-0.899	-1.153	-1.229	-0.637	-0.093
-11	-0.06%	-1.763[c]	-1.712[c]	-1.746[c]	-0.546	-0.704
-10	-0.05%	-1.295	-1.319	-1.318	-1.062	-0.524
-9	-0.06%	-1.562	-1.753[c]	-1.823[c]	-1.768[c]	-1.854[c]
-8	0.00%	0.092	-0.772	-0.807	-0.049	0.698
-7	-0.07%	-2.032[b]	-1.268	-1.503	-0.583	-1.099
-6	0.01%	0.265	-0.386	-0.391	0.264	0.051
-5	-0.03%	-0.747	-0.782	-0.817	-1.255	-0.740
-4	-0.05%	-1.270	-1.295	-1.331	-0.870	-1.423
-3	-0.06%	-1.714[c]	-1.762[c]	-1.797[c]	-0.955	-0.057
-2	-0.02%	-0.453	-1.458	-1.623	-1.101	-0.416
-1	-0.02%	-0.422	-0.853	-0.929	0.549	1.166
0	-0.28%	-7.981[a]	-6.665[a]	-12.815[a]	-6.287[a]	-3.652[a]
1	-0.10%	-2.739[a]	-2.487[b]	-3.769[a]	-2.036[b]	0.195
2	0.08%	2.353[b]	2.747[a]	3.228[a]	2.802[a]	3.035[a]
3	-0.04%	-1.058	-0.903	-0.943	-0.003	0.483
4	0.02%	0.496	-0.035	-0.041	0.996	1.813[c]
5	-0.01%	-0.177	-0.172	-0.177	0.569	1.525
6	-0.05%	-1.392	-1.993[b]	-2.092[b]	-0.863	-0.272
7	-0.04%	-1.172	-0.906	-0.968	-0.150	0.015
8	0.03%	0.868	0.550	0.577	0.192	-0.344
9	-0.03%	-0.919	-1.339	-1.436	-0.498	-0.344
10	-0.13%	-3.735[a]	-3.562[a]	-3.713[a]	-2.857[a]	-2.178[b]
11	0.05%	1.380	1.300	1.343	1.619	2.460[b]
12	-0.07%	-2.051[b]	-1.788[c]	-2.456[b]	-1.364	-0.955
13	-0.10%	-2.955[a]	-2.701[a]	-2.804[a]	-1.846[c]	-1.135
14	-0.01%	-0.414	-0.614	-0.631	-0.513	-0.200
15	-0.02%	-0.524	-0.905	-0.970	-0.630	-0.560
16	-0.05%	-1.422	-1.931[c]	-1.922[c]	-0.490	0.123
17	-0.03%	-0.916	-1.279	-1.413	-0.321	0.195
18	0.00%	0.120	-0.469	-0.479	0.248	0.662
19	-0.04%	-0.987	0.031	0.050	-0.370	-0.200
20	-0.02%	-0.669	-1.008	-1.064	-0.909	-1.926[c]

Note: This table reports the daily acquirer's Average Abnormal Returns (AARs) estimated using the CAPM with the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark. AARs are estimated over the entire period (1986-2020) for 41days centered on the announcement date (day 0). The statistical significance of AARs is assessed using five alternative tests and specifically using parametric tests (t-test, BMP-test, and Patell-test) and non-parametric tests (Corrado-test and Sign-test). The superscripts a, b and c denote the statistical significance at 1%, 5% and 10% levels, respectively.

Table 16 presents the cumulative abnormal returns (CARs) in different periods (pre-announcement, announcement and post-announcement).

Table 16. Cumulative Abnormal Returns (CARs) estimated using the CAPM for the entire period 1986-2020 as shown in Eq. 5

Event Window	Mean	Median	Std. Dev	%Pos	t-test	BMP	Patell-test	Corrado	Sign-test
Pre-announcement event windows									
[-5, -1]	-0.16	-0.24	3.67	45.5	-2.062[b]	-2.828[a]	-4.022[a]	-1.921[c]	-1.459
[-2, 0]	-0.31	-0.35	4.25	42.4	-5.122[a]	-5.746[a]	-9.678[a]	-4.055[a]	-4.946[a]
Announcement event windows									
[-20, 20]	-1.33	-1.45	10.11	43.2	-4.716[a]	-6.003[a]	-11.662[a]	-3.072[a]	-4.119[a]
[-5, 5]	-0.49	-0.53	6.18	44.9	-4.122[a]	-5.401[a]	-9.918[a]	-2.419[b]	-2.178[b]
[-3, 3]	-0.43	-0.51	5.51	44.3	-4.544[a]	-5.846[a]	-10.612[a]	-2.763[a]	-2.861[a]
[-2, 2]	-0.33	-0.44	5.20	44.0	-4.139[a]	-5.376[a]	-10.119[a]	-2.814[a]	-3.184[a]
[-1, 1]	-0.40	-0.38	4.61	43.5	-6.445[a]	-6.394[a]	-12.167[a]	-4.578[a]	-3.688[a]
Post-announcement event windows									
[0, 1]	-0.38	-0.34	4.15	42.6	-7.595[a]	-7.035[a]	-15.480[a]	-5.978[a]	-4.730[a]
[0, 2]	-0.30	-0.34	4.60	44.0	-4.840[a]	-5.873[a]	-13.616[a]	-3.271[a]	-3.184[a]
[1, 5]	-0.04	-0.15	4.23	47.3	-0.504	-1.127	-2.130[b]	0.900	0.483

Note: This table reports the acquirer's Cumulative Abnormal Returns (CARs) for alternative event-windows surrounding the M&A announcements during the entire period 1986-2020. In particular, two pre-announcement windows (i.e. (-5,-1), and (-2,0), five announcement event windows (i.e. (-20, 20), (-5, 5), (-3, 3), (-2, 2), and (-1, 1)) and three post-announcement event windows (i.e. (0, 1), (0, 2), and (1, 5)) are presented. To measure the CARs, the CAPM with the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark is used. The mean (%), the median (%), the standard deviation (%) of CARs and the percentage of positive CARs (%) across each event-window are presented. The statistical significance of CARs is assessed using three parametric tests (t-test, BMP-test, and Patell-test) and two non-parametric tests (Corrado-test and Sign-test). The superscripts a, b and c denote the statistical significance at 1%, 5% and 10% levels, respectively.

According to the results for the pre-announcement event windows, CARs in the window (-5, -1) are statistically significantly different from zero and equal to -0.16%[19]. This finding may indicate that informed investors and market participants may have speculative information that is incorporated into stock prices before the M&A announcements. Negative CARs equal to -0.31% are also presented in the three-day event window beginning two days before the initial announcement (-2,0).

In the three-day event window (-1 , +1), acquiring banks lose by about -0.40% while only the 43.5% of deals is associated with value creation for shareholders. This result implies that M&A announcements constitute a value-destroying event for shareholders. Furthermore, cumulative abnormal returns are statistically significant and positive at about -0.33% and -0.43% for the five-day (-2,2) and the seven-day (-3,3) event windows, respectively. Finally, in post-announcement period, CARs are also negative and statistically significant at the 1% level. Once again, results derived from CAPM further support the aforementioned results and suggest that M&As in the

[19] Except from the sign-test, four out of five used tests for the statistically significance provide evidence for significantly negative CARs over the (-5, -1) event window.

banking sectors convey information that negatively affect the shareholder wealth upon their announcements.

Figure 3 shows overtime the results of Average Abnormal Returns (AARs) and the Cumulative Average Abnormal Returns (CAARs) in the (-20, +20) window using the CAPM. It becomes clear that M&A destroy shareholder value upon the announcement given that AAR line significantly drop on day 0 (announcement date). CARs also take negative values in the 41-day event window (-20 , +20) and equal -1.33%.

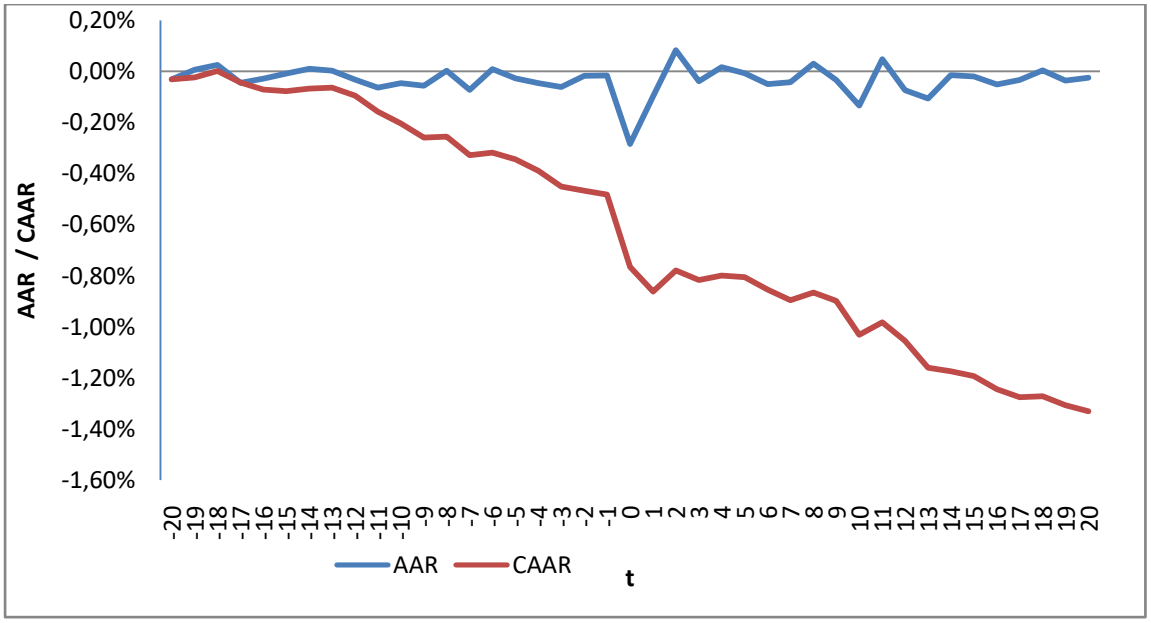

Figure 3. Daily Average Abnormal Returns (AAR) and Cumulative Average Abnormal Returns (CAAR) estimated using CAPM over the period 1986-2020

Note: This figure presents both the Average Abnormal Returns (AAR) and the Cumulative Average Abnormal Returns (CAAR) for bank acquirers over the 41-day event window surrounding the announcement date (day 0) during the entire period 1986-2020. AARs (blue line) and CAARs (red line) are estimated with the CAPM using the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark.

4.4. Three-factor model

The three-factor model is used to estimate the Average Abnormal Returns (AARs) and the Cumulative Abnormal Returns (CARs) upon the M&A announcements. The results are reported in table 17.

Table 17. Daily Average Abnormal Returns (AAR) estimated using the three-factor model over the period 1986-2020 as shown in Eq. 6

t	AAR	t-test	BMP	Patell-test	Corrado	Sign-test
-20	-0.01%	-0.413	-0.208	-0.210	0.146	0.475
-19	0.01%	0.352	0.784	0.787	1.462	1.374
-18	0.01%	0.152	-0.851	-0.889	-0.689	-0.710
-17	-0.06%	-1.744[c]	-1.310	-1.376	-1.009	-0.459
-16	-0.02%	-0.696	-0.224	-0.219	0.231	-0.099
-15	0.00%	-0.092	-0.951	-0.941	-0.182	0.044
-14	0.02%	0.634	1.534	1.638	1.240	1.158
-13	0.01%	0.224	-0.465	-0.510	0.301	0.332
-12	-0.02%	-0.485	-0.594	-0.632	0.066	-0.602
-11	-0.06%	-1.726[c]	-1.533	-1.551	-0.512	-0.890
-10	-0.04%	-1.256	-1.280	-1.291	-0.986	-0.494
-9	-0.05%	-1.428	-1.283	-1.333	-1.700[c]	-1.644
-8	0.01%	0.294	-0.514	-0.540	0.161	0.655
-7	-0.05%	-1.574	-0.729	-0.864	0.089	0.224
-6	0.00%	0.058	-0.407	-0.415	0.090	0.260
-5	-0.04%	-1.131	-1.028	-1.069	-1.621	-1.249
-4	-0.04%	-1.050	-1.332	-1.365	-1.101	-2.003[b]
-3	-0.05%	-1.402	-1.165	-1.176	-0.216	0.511
-2	0.00%	-0.079	-1.046	-1.160	-0.793	0.583
-1	-0.01%	-0.150	-0.460	-0.495	0.662	1.445
0	-0.28%	-8.129[a]	-6.829[a]	-13.812[a]	-6.529[a]	-3.835[a]
1	-0.10%	-2.866[a]	-2.443[b]	-3.877[a]	-1.979[b]	0.116
2	0.09%	2.574[b]	3.123[a]	3.753[a]	3.038[a]	2.775[a]
3	-0.03%	-1.002	-0.667	-0.711	0.275	0.368
4	0.02%	0.626	0.111	0.128	1.167	1.841[c]
5	0.00%	0.090	0.404	0.418	0.636	0.332
6	-0.03%	-0.976	-1.546	-1.647[c]	-0.442	1.158
7	-0.03%	-0.998	-0.485	-0.534	-0.058	-0.530
8	0.04%	1.174	1.098	1.161	0.845	0.296
9	-0.03%	-0.881	-1.011	-1.083	-0.212	-0.063
10	-0.11%	-3.118[a]	-2.855[a]	-2.975[a]	-2.021[b]	-1.285
11	0.05%	1.519	1.518	1.566	1.456	2.451[b]
12	-0.05%	-1.511	-1.169	-1.611	-0.675	-1.141
13	-0.10%	-2.801[c]	-2.507[b]	-2.591[b]	-1.749[c]	-1.464
14	0.01%	0.380	0.413	0.423	0.554	0.224
15	-0.02%	-0.651	-0.914	-0.978	-0.716	-0.782
16	-0.03%	-0.958	-1.309	-1.312	-0.002	0.404
17	-0.02%	-0.542	-1.037	-1.167	-0.528	0.547
18	0.01%	0.347	0.064	0.065	0.616	0.907
19	-0.03%	-0.917	0.096	0.151	-0.212	0.116
20	-0.02%	-0.487	-0.586	-0.609	-0.430	-0.782

Note: This table reports the daily acquirer's Average Abnormal Returns (AARs) estimated using the market adjusted model with the three-factor model. AARs are estimated over the entire period (1986-2020) for 41days centered on the announcement date (day 0). The statistical significance of AARs is assessed using five alternative tests and specifically using parametric tests (t-test, BMP-test, and Patell-test) and non-parametric tests (Corrado-test and Sign-test). The superscripts a, b and c denote the statistical significance at 1%, 5% and 10% levels, respectively.

In the pre-announcement period, according to the results presented in table 17, daily AARs are negative but mainly insignificant different from zero. The usage of five alternative tests of significance fail to provide robust evidence for systematically information leakage prior to the official announcement date. Furthermore, M&A announcements are associated with negative and significant abnormal returns on the announcement day. Specifically, AARs on day 0 equal to -0.28% and are significant at the 1% level using five alternative tests for assessing the significance.

Table 18 presents the CARs and the corresponding tests for assessing the significance.

Table 18. Cumulative Abnormal Returns (CARs) estimated using the three-factor model for the entire period 1986-2020 as shown in Eq. 6

Event Window	Mean	Median	Std. Dev	%Pos	t-test	BMP	Patell-test	Corrado	Sign-test
Pre-announcement event windows									
[-5, -1]	-0.13	-0.26	3.58	45.8	-1.717[c]	-2.516[b]	-3.514[a]	-1.571	-1.967[b]
[-2, 0]	-0.29	-0.32	4.23	43.4	-4.862[a]	-5.548[a]	-9.484[a]	-3.875[a]	-4.662[a]
Announcement event windows									
[-20, 20]	-1.07	-1.17	9.75	43.8	-3.870[a]	-4.693[a]	-9.149[a]	-1.776[c]	-4.195[a]
[-5, 5]	-0.44	-0.57	6.07	44.7	-3.784[a]	-5.070[a]	-9.362[a]	-1.989[b]	-3.189[a]
[-3, 3]	-0.38	-0.50	5.44	44.1	-4.206[a]	-5.231[a]	-9.658[a]	-2.149[b]	-3.871[a]
[-2, 2]	-0.30	-0.40	5.18	44.8	-3.896[a]	-5.054[a]	-9.744[a]	-2.538[b]	-3.081[a]
[-1, 1]	-0.39	-0.41	4.58	43.6	-6.484[a]	-6.376[a]	-12.500[a]	-4.548[a]	-4.410[a]
Post-announcement event windows									
[0, 1]	-0.38	-0.35	4.12	42.6	-7.835[a]	-7.187[a]	-16.553[a]	-6.041[a]	-5.452[a]
[0, 2]	-0.29	-0.37	4.56	43.8	-4.900[a]	-5.929[a]	-14.387[a]	-3.193[a]	-4.123[a]
[1, 5]	-0.02	-0.16	4.14	48.0	-0.260	-0.706	-1.383	1.340	0.547

Note: This table reports the acquirer's Cumulative Abnormal Returns (CARs) for alternative event-windows surrounding the M&A announcements during the entire period 1986-2020. In particular, two pre-announcement windows (i.e. (-5,-1), and (-2,0), five announcement event windows (i.e. (-20, 20), (-5, 5), (-3, 3), (-2, 2), and (-1, 1)) and three post-announcement event windows (i.e. (0, 1), (0, 2), and (1, 5)) are presented. To measure the CARs, the three-factor model is used. The mean (%), the median (%), the standard deviation (%) of CARs and the percentage of positive CARs (%) across each event-window are presented. The statistical significance of CARs is assessed using three parametric tests (t-test, BMP-test, and Patell-test) and two non-parametric tests (Corrado-test and Sign-test). The superscripts a, b and c denote the statistical significance at 1%, 5% and 10% levels, respectively.

In the window prior to the official M&A announcement (-5, -1), as shown in table 18, CARs are significantly different from zero and equal to -0.13%. This result suggests that prior to the announcement there is some leakage of information regarding the imminent deals and therefore well-informed investors react prior to the announcement. Negative CARs (-0.29%) are also presented in the window (-2,0).

Across the announcement windows, there is robust evidence that bank M&As constitute events that destroy shareholder wealth. Over the 41-day event window (-20,+20) acquiring banks experience loses by about -1.07%, whereas the loses account for -0.30% over the five-day (-5,+5) event window. Furthermore, results derived from the three-factor model indicate that the average thee-day CARs (-1 , 1)

are significant at the 1% level and equal to -0.39%, whereas only the 43.6% of the M&As are associated with value creation over the three-day window. Significant and negative CARs are also presented for two-day and three-day CARs starting on the announcement day. Given that CARs over the (+1,+5) window are insignificant, systematically market reaction is presented only in periods very close to the announcement date.

Figure 4 captures the wealth effects of bank M&As in the U.S. using both the AARs and the CAARs over the 41-day period.

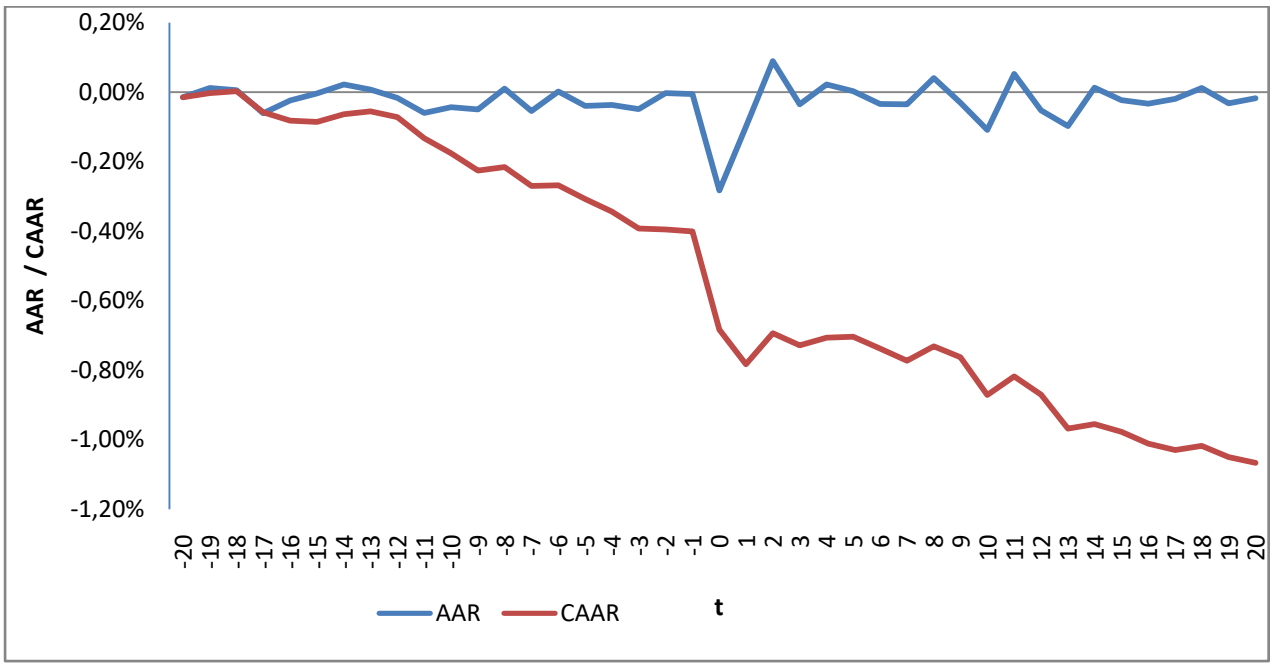

Figure 4. Daily Average Abnormal Returns (AAR) and Cumulative Average Abnormal Returns (CAAR) estimated using the three-factor model over the period 1986-2020
Note: This figure presents both the Average Abnormal Returns (AAR) and the Cumulative Average Abnormal Returns (CAAR) for bank acquirers over the 41-day event window surrounding the announcement date (day 0) during the entire period 1986-2020. AARs (blue line) and CAARs (red line) are estimated with the Fama-French three-factor model.

Figure 4 shows that upon the day 0 there is a strong negative reaction to the M&A announcements. Therefore, the higher magnitude of negative AAR is observed on the announcement date (day 0), the higher magnitude of negative CAR is captured over the 41-day event window.

4.5. Four-factor model

Table 19 presents the AARs which are estimated using the four-factor model as well as the corresponding tests for a period of 41-days surrounding the deal announcements. Daily AARs are evaluated using five alternative tests for statistically significance.

Table 19. Daily Average Abnormal Returns (AAR) estimated using the four-factor model over the period 1986-2020 as shown in Eq. 7

t	AAR	t-test	BMP	Patell-test	Corrado	Sign-test
-20	-0.02%	-0.462	-0.307	-0.310	-0.105	-0.587
-19	0.01%	0.194	0.674	0.677	1.394	1.173
-18	0.01%	0.191	-0.821	-0.856	-0.582	0.383
-17	-0.06%	-1.698[c]	-1.279	-1.345	-0.959	-0.228
-16	-0.03%	-0.785	-0.215	-0.210	0.255	0.239
-15	0.00%	0.026	-0.784	-0.772	-0.211	0.024
-14	0.03%	0.741	1.562	1.671[c]	1.252	1.532
-13	0.01%	0.392	-0.421	-0.462	0.179	-0.264
-12	-0.01%	-0.368	-0.527	-0.562	0.129	0.024
-11	-0.06%	-1.597	-1.437	-1.458	-0.457	-0.731
-10	-0.04%	-1.255	-1.305	-1.318	-1.083	-0.407
-9	-0.05%	-1.347	-1.112	-1.160	-1.608	-1.521
-8	0.02%	0.444	-0.521	-0.550	0.303	0.958
-7	-0.05%	-1.446	-0.618	-0.737	0.172	-0.120
-6	0.01%	0.145	-0.387	-0.396	0.011	0.239
-5	-0.04%	-1.153	-1.184	-1.235	-1.795[c]	-0.910
-4	-0.04%	-1.043	-1.338	-1.380	-1.098	-1.916[c]
-3	-0.04%	-1.091	-0.853	-0.860	0.034	0.922
-2	0.00%	-0.097	-1.043	-1.159	-0.757	1.173
-1	0.00%	-0.086	-0.515	-0.556	0.638	1.532
0	-0.29%	-8.188[a]	-6.973[a]	-14.222[a]	-6.525[a]	-3.856[a]
1	-0.11%	-3.040[a]	-2.605[b]	-4.180[a]	-2.049[b]	0.096
2	0.09%	2.493[b]	3.069[a]	3.683[a]	2.867[a]	2.574[b]
3	-0.04%	-1.046	-0.699	-0.750	0.207	0.922
4	0.02%	0.635	0.376	0.420	1.116	1.712[c]
5	0.00%	0.106	0.398	0.414	0.648	0.742
6	-0.03%	-0.841	-1.453	-1.551	-0.422	0.132
7	-0.03%	-0.901	-0.516	-0.570	-0.169	-0.623
8	0.04%	1.050	0.815	0.866	0.588	-0.012
9	-0.03%	-0.839	-1.029	-1.108	-0.381	-0.479
10	-0.12%	-3.344[a]	-3.041[a]	-3.166[a]	-2.195[b]	-1.880[c]
11	0.05%	1.571	1.573	1.635	1.652[c]	2.861[a]
12	-0.05%	-1.441	-1.105	-1.544	-0.582	-0.695
13	-0.10%	-2.854[a]	-2.493[b]	-2.590[b]	-1.708[c]	-1.593
14	0.00%	0.134	0.252	0.262	0.280	0.060
15	-0.02%	-0.519	-0.807	-0.868	-0.659	-1.018
16	-0.03%	-0.962	-1.266	-1.279	0.175	0.850
17	-0.02%	-0.552	-0.962	-1.095	-0.455	0.634
18	0.02%	0.603	0.443	0.457	0.939	1.856[c]
19	-0.03%	-0.757	0.222	0.349	0.009	0.167
20	-0.02%	-0.621	-0.807	-0.846	-0.835	-1.557

Note: This table reports the daily acquirer's Average Abnormal Returns (AARs) estimated using the four-factor model. AARs are estimated over the entire period (1986-2020) for 41days centered on the announcement date (day 0). The statistical significance of AARs is assessed using five alternative tests and specifically using parametric tests (t-test, BMP-test, and Patell-test) and non-parametric tests (Corrado-test and Sign-test). The superscripts a, b and c denote the statistical significance at 1%, 5% and 10% levels, respectively.

Table 19 reports the AAR over the 41-day event window (-20, +20). In pre-announcement period (day -20 to day -1) there is not robust evidence of significantly different from zero AARs. AAR obtained on the announcement date (day 0) still remains negative (-0.29%) and is significant at the 1% level using the five used tests of the significance. In post-announcement period (+1, +20), AARs in short periods after the announcements are statistically significant. Specifically, on day 1 there are negative AARs that equal to -0.11% while on day 2 there are positive AARs equal to 0.09% and partially reverse the wealth losses. However, there are significant losses that equal to -0.12% and -0.10% for day 10 and day 13 after the M&A announcements, respectively. To analyze CARs over shorter event windows, table 20 presents the results of CARs estimated using the four-factor model.

Table 20. Cumulative Abnormal Returns (CARs) estimated using the four-factor model for the entire period 1986-2020 as shown in Eq. 7

Event Window	Mean	Median	Std. Dev	%Pos	t-test	BMP	Patell-test	Corrado	Sign-test
Pre-announcement event windows									
[-5, -1]	-0.12	-0.27	3.61	45.4	-1.567	-2.509[b]	-3.536[a]	-1.520	-2.527[b]
[-2, 0]	-0.29	-0.35	4.25	43.5	-4.886[a]	-5.684[a]	-9.763[a]	-3.877[a]	-4.682[a]
Announcement event windows									
[-20, 20]	-1.03	-1.20	9.83	43.9	-3.749[a]	-4.667[a]	-9.154[a]	-1.848[c]	-4.179[a]
[-5, 5]	-0.44	-0.56	6.11	44.3	-3.794[a]	-5.187[a]	-9.612[a]	-2.082[b]	-3.712[a]
[-3, 3]	-0.39	-0.47	5.47	44.1	-4.220[a]	-5.266[a]	-9.761[a]	-2.179[b]	-3.963[a]
[-2, 2]	-0.31	-0.41	5.21	45.1	-4.030[a]	-5.267[a]	-10.206[a]	-2.646[a]	-2.814[a]
[-1, 1]	-0.39	-0.41	4.59	43.0	-6.605[a]	-6.600[a]	-13.026[a]	-4.619[a]	-5.185[a]
Post-announcement event windows									
[0, 1]	-0.39	-0.36	4.12	42.7	-8.029[a]	-7.407[a]	-17.178[a]	-6.093[a]	-5.508[a]
[0, 2]	-0.30	-0.37	4.58	43.9	-5.100[a]	-6.169[a]	-15.052[a]	-3.340[a]	-4.143[a]
[1, 5]	-0.03	-0.21	4.19	47.5	-0.385	-0.816	-1.614	1.154	-0.192

Note: This table reports the acquirer's Cumulative Abnormal Returns (CARs) for alternative event-windows surrounding the M&A announcements during the entire period 1986-2020. In particular, two pre-announcement windows (i.e. (-5,-1), and (-2,0), five announcement event windows (i.e. (-20, 20), (-5, 5), (-3, 3), (-2, 2), and (-1, 1)) and three post-announcement event windows (i.e. (0, 1), (0, 2), and (1, 5)) are presented. To measure the CARs, the four-factor model is used. The mean (%), the median (%), the standard deviation (%) of CARs and the percentage of positive CARs (%) across each event-window are presented. The statistical significance of CARs is assessed using three parametric tests (t-test, BMP-test, and Patell-test) and two non-parametric tests (Corrado-test and Sign-test). The superscripts a, b and c denote the statistical significance at 1%, 5% and 10% levels, respectively.

Results reported in table 20 show that bank M&As destroy shareholder wealth. Specifically, in pre-announcement period there is an indication of some information leakage because CARs in the (-5, -1) window are negative and significant using three-out of five tests of significance. The negative market reaction is also supported by the CARs in the (-2,0) event window.

In the announcement period, CARs estimated with the four-factor model indicate that acquiring banks experience loses by about -0.39% on the three-day window (-1 ,1)

while their loses account for -0.44% on the eleven-day window (-5, 5) window. The impact of M&A announcements on the shareholder wealth is also statistically significant and negative both for the seven-day (-0.39%) and the five-day (-0.31) event windows. Therefore, across all the applied event-windows centered on the announcement date, the existence of negative CARs suggest that bank M&As in the U.S. destroy shareholder wealth upon the announcement. Finally, in the post-announcement period, CARs both in the two-day (0,+1) and the three-day (0, +2) are negative and significant while CARs over the five-day window begging at the next day of the announcement (+1, +5) are insignificantly different from zero with the five applied tests. Figure 5 presents the daily AARs and the CAARs over the 41-day (-20, +20) event window.

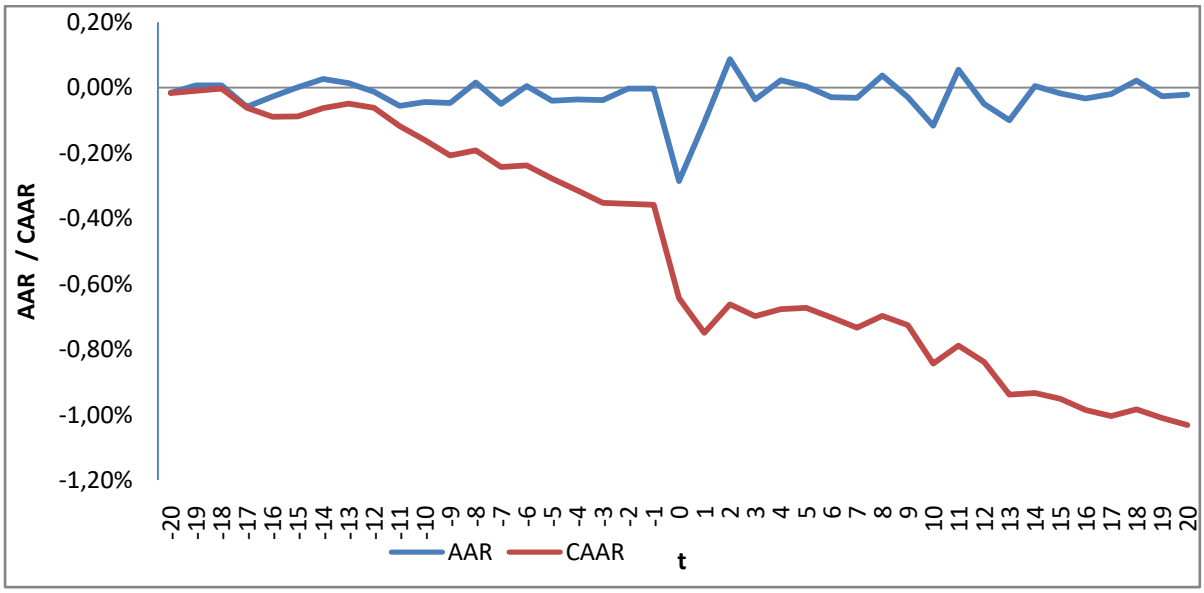

Figure 5. Daily Average Abnormal Returns (AAR) and Cumulative Average Abnormal Returns (CAAR) estimated using the four-factor model over the period 1986-2020

Note: This figure presents both the Average Abnormal Returns (AAR) and the Cumulative Average Abnormal Returns (CAAR) for bank acquirers over the 41-day event window surrounding the announcement date (day 0), during the entire period 1986-2020. AARs (blue line) and CAARs (red line) are estimated with the four-factor model.

Figure 5 indicates that upon the announcement date (day 0) AARs significantly drop to a level of about -0.29%. This negative reaction to bank M&A announcements is also persistent in the next of the announcement date (day 1); however, AARs reach positive levels (0.09%) on the second day after the announcement date (day 2) and then they return to a pattern of normal levels (zero AARs) implying that the strong market reaction is observed only surrounding the official M&A announcements.

4.6. Five-factor model

Table 21 reports the AARs for bank M&As over a 41-day period centered on the announcement day using the five-factor model.

Table 21. Daily Average Abnormal Returns (AAR) estimated using the five-factor model over the period 1986-2020 as shown in Eq. 8

t	AAR	t-test	BMP	Patell-test	Corrado	Sign-test
-20	-0.02%	-0.521	-0.389	-0.393	-0.217	-0.025
-19	0.01%	0.429	0.950	0.959	1.682[c]	2.166[b]
-18	0.01%	0.155	-0.961	-1.002	-0.798	-0.635
-17	-0.06%	-1.673[c]	-1.159	-1.222	-0.930	-0.420
-16	-0.03%	-0.747	-0.214	-0.209	0.219	0.334
-15	-0.01%	-0.334	-1.217	-1.209	-0.519	0.227
-14	0.02%	0.705	1.591	1.701[c]	1.218	1.017
-13	0.01%	0.364	-0.318	-0.349	0.493	0.586
-12	-0.01%	-0.365	-0.525	-0.561	0.233	0.227
-11	-0.06%	-1.759[c]	-1.438	-1.460	-0.538	-0.887
-10	-0.04%	-1.178	-1.005	-1.017	-0.907	-0.528
-9	-0.05%	-1.362	-1.114	-1.165	-1.483	-1.425
-8	0.01%	0.350	-0.402	-0.426	0.424	1.160
-7	-0.05%	-1.559	-0.581	-0.697	0.285	-0.456
-6	0.01%	0.371	0.079	0.080	0.536	0.586
-5	-0.04%	-1.105	-0.959	-1.002	-1.453	-0.743
-4	-0.04%	-1.120	-1.362	-1.399	-1.204	-1.677[c]
-3	-0.05%	-1.460	-1.240	-1.262	-0.408	-0.348
-2	0.00%	-0.135	-1.034	-1.147	-0.804	0.514
-1	0.00%	-0.118	-0.380	-0.409	0.652	0.981
0	-0.29%	-8.312[a]	-6.986[a]	-14.253[a]	-6.781[a]	-4.011[a]
1	-0.10%	-2.798[a]	-2.346[b]	-3.769[a]	-1.949[c]	0.263
2	0.09%	2.631[a]	3.270[a]	3.969[a]	3.090[a]	2.633[a]
3	-0.04%	-1.024	-0.474	-0.511	0.291	0.119
4	0.02%	0.671	0.168	0.194	1.230	1.304
5	0.01%	0.172	0.550	0.571	0.845	0.981
6	-0.04%	-1.165	-1.779[c]	-1.910[c]	-0.739	0.586
7	-0.03%	-0.788	-0.278	-0.309	0.189	0.191
8	0.05%	1.305	1.363	1.441	1.227	0.801
9	-0.03%	-0.900	-0.863	-0.930	-0.131	-0.851
10	-0.10%	-2.932[a]	-2.513[b]	-2.639[a]	-1.817[c]	-1.461
11	0.06%	1.646	1.650	1.710[c]	1.513	2.202[b]
12	-0.05%	-1.472	-1.075	-1.482	-0.646	-0.492
13	-0.09%	-2.535[b]	-2.196[b]	-2.273[b]	-1.516	-0.743
14	0.02%	0.498	0.618	0.638	0.683	0.155
15	-0.02%	-0.691	-0.913	-0.979	-0.697	-1.282
16	-0.04%	-1.258	-1.591	-1.599	-0.380	0.083
17	-0.01%	-0.424	-0.900	-1.014	-0.503	0.227
18	0.02%	0.485	0.244	0.250	0.766	0.658
19	-0.03%	-0.719	0.238	0.374	-0.077	0.119
20	-0.02%	-0.518	-0.648	-0.673	-0.565	-0.420

Note: This table reports the daily acquirer's Average Abnormal Returns (AARs) estimated using the five-factor model. AARs are estimated over the entire period (1986-2020) for 41days centered on the announcement date (day 0). The statistical significance of AARs is assessed using five alternative tests and specifically using parametric tests (t-test, BMP-test, and Patell-test) and non-parametric tests (Corrado-test and Sign-test). The superscripts a, b and c denote the statistical significance at 1%, 5% and 10% levels, respectively.

Results presented in table 21 further confirm that both the higher magnitude of AARs and the higher corresponding values of tests for significance are present on the announcement date (day 0). Specifically, on the announcement date (day 0) AARs are -0.29% and significant whereas on the next day (day 1) equal to -0.10%. The negative sign of AARs is not persistent in the second day after the announcement, since AARs are significant and equal to 0.09%. Moreover, significantly different from zero AARs are shown on 6-, 10- and 13-days after the M&A announcement. CARs across several event windows in periods before, during and after the M&A announcements are presented in table 22.

Table 22. Cumulative Abnormal Returns (CARs) estimated using the five-factor model for the entire period 1986-2020 as shown in Eq. 8

Event Window	Mean	Median	Std. Dev	%Pos	t-test	BMP	Patell-test	Corrado	Sign-test
Pre-announcement event windows									
[-5, -1]	-0.14	-0.22	3.60	46.3	-1.782[c]	-2.481[b]	-3.475[a]	-1.628	-1.641
[-2, 0]	-0.30	-0.31	4.24	43.5	-5.012[a]	-5.615[a]	-9.665[a]	-4.035[a]	-4.837[a]
Announcement event windows									
[-20, 20]	-1.02	-1.17	9.85	44.1	-3.707[a]	-4.302[a]	-8.466[a]	-1.488	-4.119[a]
[-5, 5]	-0.44	-0.54	6.08	44.3	-3.830[a]	-4.963[a]	-9.252[a]	-1.965[b]	-3.939[a]
[-3, 3]	-0.39	-0.51	5.46	43.8	-4.291[a]	-5.198[a]	-9.693[a]	-2.261[b]	-4.514[a]
[-2, 2]	-0.31	-0.37	5.19	45.1	-3.956[a]	-5.021[a]	-9.774[a]	-2.610[a]	-3.006[a]
[-1, 1]	-0.39	-0.40	4.58	43.3	-6.570[a]	-6.427[a]	-12.664[a]	-4.697[a]	-5.089[a]
Post-announcement event windows									
[0, 1]	-0.39	-0.38	4.13	42.8	-7.963[a]	-7.282[a]	-16.918[a]	-6.209[a]	-5.627[a]
[0, 2]	-0.30	-0.36	4.56	43.7	-4.962[a]	-5.987[a]	-14.627[a]	-3.277[a]	-4.550[a]
[1, 5]	-0.01	-0.13	4.15	48.1	-0.158	-0.458	-0.905	1.552	0.370

Note: This table reports the acquirer's Cumulative Abnormal Returns (CARs) for alternative event-windows surrounding the M&A announcements during the entire period 1986-2020. In particular, two pre-announcement windows (i.e. (-5,-1), and (-2,0), five announcement event windows (i.e. (-20, 20), (-5, 5), (-3, 3), (-2, 2), and (-1, 1)) and three post-announcement event windows (i.e. (0, 1), (0, 2), and (1, 5)) are presented. To measure the CARs, the five-factor model is used. The mean (%), the median (%), the standard deviation (%) of CARs and the percentage of positive CARs (%) across each event-window are presented. The statistical significance of CARs is assessed using three parametric tests (t-test, BMP-test, and Patell-test) and two non-parametric tests (Corrado-test and Sign-test). The superscripts a, b and c denote the statistical significance at 1%, 5% and 10% levels, respectively.

Using the five-factor model, results in table 22 indicate that CARs are negative and significant implying wealth destruction upon the announcement of bank M&As. Specifically, in the pre-announcement period, the significantly negative CAR that equals to -0.14% over the five-day (-5, -1) event window may be due to the leakage of some information regarding the imminent announcement. Using shorter windows surrounding the deal announcements, the results indicate negative and significant CARs. Specifically, acquiring banks lose about -0.39% over the three-day (-1,1) event window. This result also persists over longer periods, lasting 41-days (-20, 20), surrounding the announcement.

The trend of AARs and CAARs for 20 days before and 20 days after M&A announcement (t=0) is presented in figure 6.

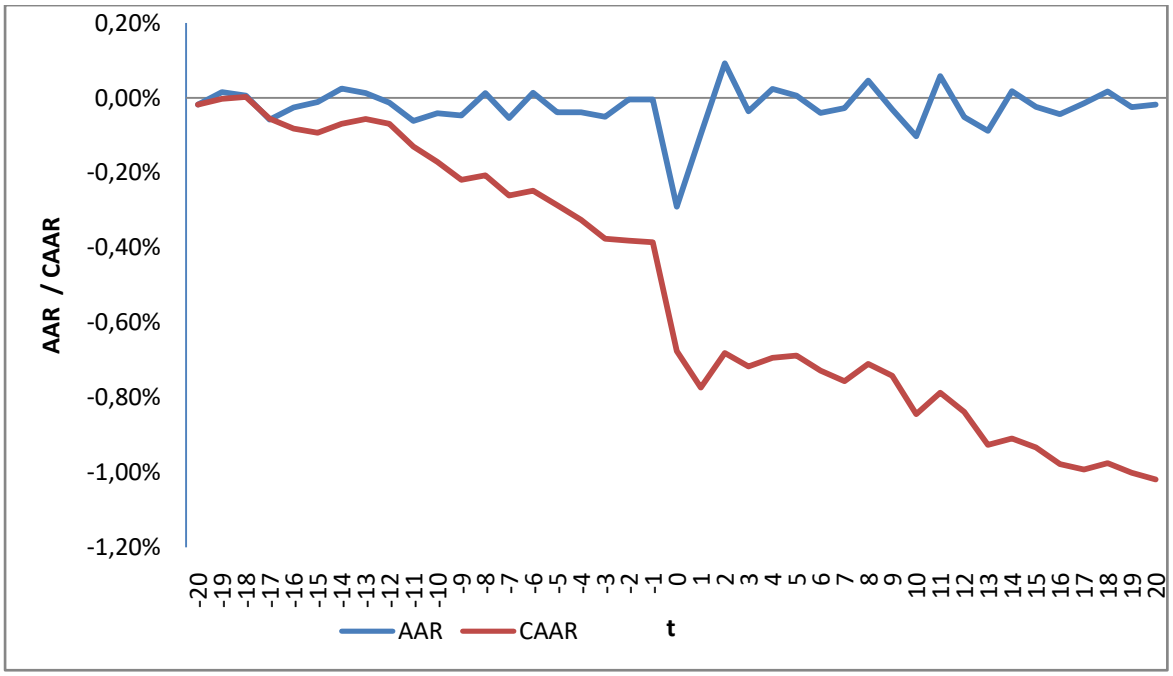

Figure 6. Daily Average Abnormal Returns (AAR) and Cumulative Average Abnormal Returns (CAAR) estimated using the five-factor model over the period 1986-2020
This figure presents both the Average Abnormal Returns (AAR) and the Cumulative Average Abnormal Returns (CAAR) for bank acquirers over the 41-day event window surrounding the announcement date (day 0), during the entire period 1986-2020. AARs (blue line) and CAARs (red line) are estimated with the five-factor model.

As can be seen from figure 6, there is a strong decline in AARs on the announcement date suggesting that asset prices negatively were affected by M&A announcements. CAARs also follow a downward trend over the 41-day event window and reach to a lower than -1.0% level over the (-20,+20) window.

4.7. Descriptive comparison of AARs and CAARs

The results derived from the applied asset pricing models suggest that CARs are negative and significant though there are some variations in the estimation of CARs with regard to the used asset pricing model. A vast majority of prior research focus capture the announcement effects of M&As using short event-windows surrounding the announcements. Table 23 presents the comparison for CARs calculated over the three-day (-1,1) and the five-day (-2,2) event windows centered on the announcement date using alternative asset pricing models.

Table 23. Comparison of the acquirer's Cumulative Abnormal Returns (CARs) across alternative asset pricing models during the entire period 1986-2020

Panel A: Descriptive comparison and Friedman's test								
	CAR (-1,1)				CAR (-2,2)			
Asset pricing model	Mean	Median	St. Dev.	Mean Rank	Mean	Median	St. Dev.	Mean Rank
Market adjusted model	-0.32	-0.32	4.68	3.61	-0.20	-0.35	5.24	3.62
Market model	-0.35	-0.34	4.61	4.05	-0.26	-0.37	519	4.06
CAPM	-0.40	-0.38	4.61	3.03	-0.33	-0.44	5.20	3.02
Three-factor model	-0.39	-0.41	4.58	3.45	-0.30	-0.40	5.18	3.43
Four-factor model	-0.39	-0.41	4.59	3.43	-0.31	-0.41	5.21	3.41
Five-factor model	-0.39	-0.40	4.58	3.44	-0.31	-0.37	5.19	3.47
Friedman's Chi-Square	483.632[a]				506.431[a]			
df	5				5			
P-value	0.000				0.000			

Panel B: Post-hoc analysis / pairwise comparisons										
Sample 1 – Sample 2	Test Statistic	Std. Error	Std. Test Statistic	P-value	Adj. P-value	Test Statistic	Std. Error	Std. Test Statistic	P-value	Adj. P-value
CAPM - four factor model	-0.405	0.047	-8.530	0.000	0.000	-0.393	0.047	-8.276	0.000	0.000
CAPM - five factor model	-0.408	0.047	-8.605	0.000	0.000	-0.454	0.047	-9.574	0.000	0.000
CAPM - three factor model	-0.419	0.047	-8.822	0.000	0.000	-0.409	0.047	-8.608	0.000	0.000
CAPM - market adjusted model	0.581	0.047	12.246	0.000	0.000	0.599	0.047	12.612	0.000	0.000
CAPM - market model	1.017	0.047	21.421	0.000	0.000	1.037	0.047	21.854	0.000	0.000
four factor model - five factor model	-0.004	0.047	-0.075	0.941	1.000	-0.062	0.047	-1.299	0.194	1.000
four factor model - three factor model	0.014	0.047	0.292	0.771	1.000	0.016	0.047	0.332	0.740	1.000
four factor model - market adjusted model	0.176	0.047	3.716	0.000	0.003	0.206	0.047	4.336	0.000	0.000
four factor model - market model	0.612	0.047	12.890	0.000	0.000	0.645	0.047	13.579	0.000	0.000
five factor model - three factor model	0.010	0.047	0.217	0.828	1.000	0.046[20]	0.047	0.966[20]	0.334	1.000
five factor model - market adjusted model	0.173	0.047	3.641	0.000	0.004	0.144	0.047	3.038	0.002	0.036
five factor model - market model	0.608	0.047	12.816	0.000	0.000	0.583	0.047	12.280	0.000	0.000
three factor model - market adjusted model	0.163	0.047	3.424	0.001	0.009	0.190	0.047	4.004	0.000	0.001
three factor model - market model	0.598	0.047	12.599	0.000	0.000	0.629	0.047	13.246	0.000	0.000
market adjusted model - market model	-0.435	0.047	-9.174	0.000	0.000	-0.439	0.047	-9.242	0.000	0.000

Note: Panel A of this table reports the mean, the median and the standard deviation values of the acquirer's CARs estimated using alternative asset pricing models during the entire-period 1986-2020 as well as the results of Friedman's test. Panel B reports the post-hoc analysis using the Dunn-Bonferroni test for post-hoc pairwise comparisons.

According to Panel A of table 23, mean and median CARs for the whole sample derived from market adjusted model present higher values compared to those estimated using alternative asset pricing models. In contrast, the usage of CAPM

[20] In this case, both the test statistic and the std. test statistic derived from the pairwise comparison of three factor model (sample 1) – five factor model (sample 2).

results to a downward estimation of average CARs. In particular, three-day CAR equals to -0.32% using the market-adjusted model while it equals to -0.40% using the CAPM. Moreover, the results indicate that the factor models (e.g. three-factor, four-factor, and five-factor models) provide about similar estimations of CARs both at mean and at median level. To further analyze the numerical distribution of CARs across the six alternative asset pricing models, figure 7 displays the corresponding boxplots for each model and both windows. It is observed that the medians of CARs are negative irrespectively of both the selected event-window and the applied asset pricing model.

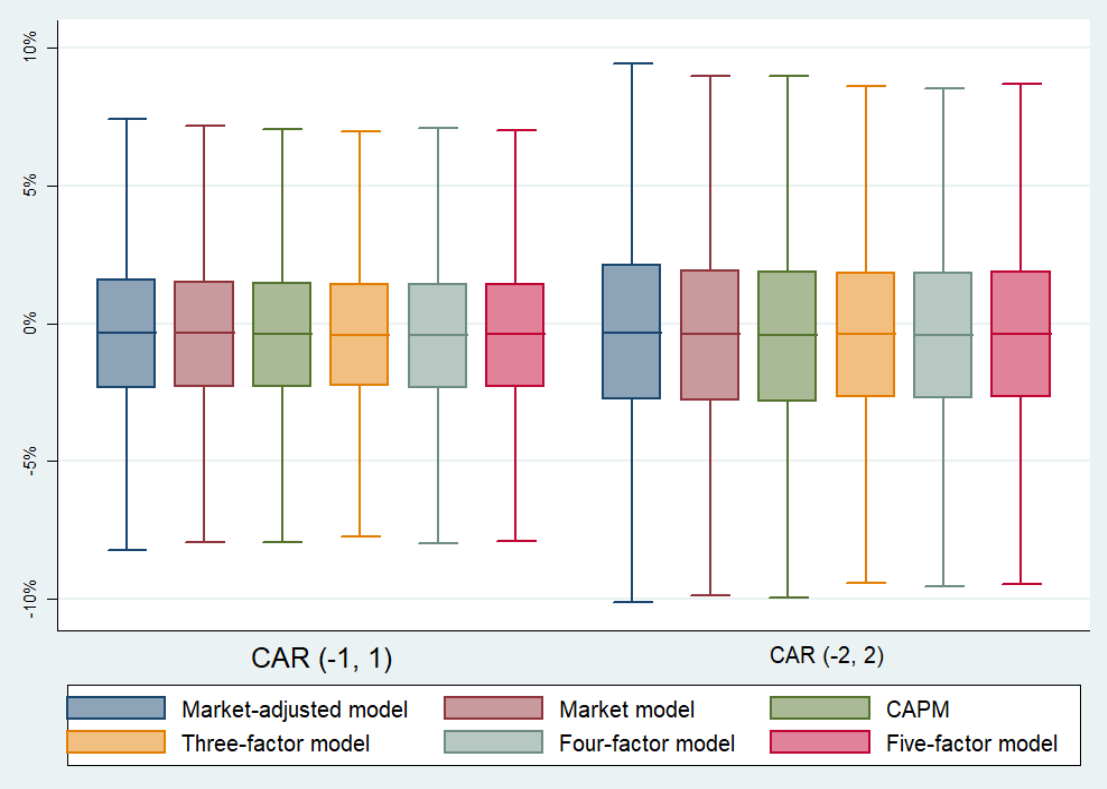

Figure 7. Boxplots for both three-day (-1, +1) and five-day (-2, +2) CARs that are estimated using alternative asset pricing models over the period 1986-2020

Several studies (Demšar, 2006; Fitzpatrick and Mues, 2021; Lessmann et al., 2015) apply the Friedman's test for equality of ranks to detect differences between different models/methods in related samples (single dataset). The null hypothesis of Friedman's test is that the distributions of k related samples are the same (with k-1 degrees of freedom). In case of null-hypothesis rejection, post-hoc analysis can provide evidence on the exact pairwise differences. In finance, for example, Meade and Salkin (2000) analyzed the selection of a multinational asset portfolio and applied the Friedman's test to evaluate the forecasting superiority of each model whereas Coggins et al. (2009) examined the mutual fund performance and applied the Friedman's test in order to analyze whether alphas were different either across conditional and unconditional models or across mutual funds. In this thesis, to evaluate whether the distributions of CARs for 3,107 deals are the same among the

six (k=6) alternative asset pricing models, the non-parametric Friedman-test is twice applied for both the three-day (-1, +1) and the five-day (-2, +2) event windows centered on the announcement date. In this case, the null hypothesis of Friedman's test is that ranks for CARs across the six asset pricing models are equal[21].

With respect to the CARs over the three-day event window (-1,+1), the Friedman's test (Chi-square=483.632) shows that at least one asset pricing model concludes to three-day CARs with different distribution and this result is significant at the 1% level. In the similar manner, at the 1% level of significance (Chi-square=506.431), over the five-day event window (-2, +2) there is at least one asset pricing model which estimates CARs with different distribution. Overall, the hypothesis of equal distributions is rejected both for the three-day and the five-day event windows implying that at least one model provides results with significantly different mean rank. To compare the results among the several models, Panel B of table 23 presents the results of the post-hoc analysis using the Dunn's test with the Bonferroni-adjusted significance for the multiple pairwise comparisons. Specifically, the analysis of the fifteen (15) pairwise comparisons shows that the null hypothesis of equal distributions is not rejected only for pairwise comparisons of CARs among factor models, implying that factor-models estimate CARs with insignificantly different distributions. Regardless the differences in the magnitude of CARs with regard to the asset pricing models, the results suggest that bank M&As destroy wealth upon the announcement. In this study alternative asset pricing models are used in several stages of the analysis in order to provide strong evidence for the robustness of the results.

4.8. Long-run performance of M&As

The long-run performance of bank M&As is assessed using the Buy-and-Hold Abnormal Returns (BHARs) for a holding period of 3-months, 6-months, 1-year, 2-years and 3-years after the completion of M&As. The BHARs are estimated over the CRSP NYSE/AMEX/NASDAQ value-weighted index and the results of BHARs are presented in table 24.

[21] The Friedman's test as well as the Dunn-Bonferroni test for post-hoc pairwise comparisons are performed using the nonparametric test for two or more related samples in SPSS.

Table 24. Buy-and-Hold Abnormal Returns (BHARs) for the entire period 1986-2020

	window	N	BHARs	Bootstrapped Skewness-adjusted T-stat
BHARs for 3-month period	(1, 63)	2953	-1.02[a]	-4.335
BHARs for 6-month period	(1, 126)	2953	-1.80[a]	-5.145
BHARs for 1-year period	(1, 252)	2953	-2.72	-2.168
BHARs for 2-year period	(1, 504)	2411	-3.93[b]	-2.770
BHARs for 3-year period	(1, 756)	2411	-5.33	-1.950

Note: This table reports the acquirer's Buy-and-Hold Abnormal Returns (BHARs) that estimated over the CRSP NYSE/AMEX/NASDAQ value-weighted index. BHARs are estimated for a holding period that varies from 3-months to 3-years after the completion (effective) date. The statistical significance of BHARs is assessed using the bootstrapped skewness-adjusted t-test. The superscripts a, b, and c denote the statistical significance at 1%, 5%, and 10% levels, respectively.

The results in table 24 show the existence of negative Buy-and-Hold Abnormal Returns (BHARs) for alternative holding periods beginning after the completion of bank M&As. The statistical significance of the results is assessed using the bootstrapped skewness adjusted t-stat. For the three-month holding period after the deal completion, BHARs are negative and significant equal to -1.02%, whereas for the six-month holding period BHARs equal to -1.80%. For the two-year holding period after the M&A completion, the results also indicate the existence of negative and significant long-run performance that equal to -3.93%.

Chapter 5: Deal characteristics and Determinants of Shareholder Wealth

In this chapter, acquirer's shareholder wealth is assessed for the entire period and CARs are reported for sub-samples with respect to the different deal characteristics. Specifically, AARs and CAARs are reported with respect to the deal geographic orientation, the mean of deal payment, the deal industry orientation as well as the selection of public/private targets. The determinants of shareholder wealth are investigated using various cross-sectional models for the impact of bank-specific and deal-specific characteristics on the performance of bank M&As.

5.1. Acquirer's shareholder wealth with respect to the M&A geographic focus

Considering the geographic focus of the announced M&As, the sample is separated into two-groups. As interstate deals are characterized the bank M&As which involve acquirers and targets from different U.S. states, whereas as intrastate deals are characterized those deals that involve acquirers and targets from the same state. The results derived from the market-adjusted model with respect to the deal geographic focus are presented in the table 25 and show that CARs for interstate bank M&As are negative and significant across nine out of ten applied event windows. Specifically, mean CARs upon the five-day event window (-2,2) surrounding the deal announcement are statistically significant at the 1% level and equal to -0.50% while mean CARs in the three-day (-1, 1) event window CARs are also significant and equal to -0.50%.

With respect to the intrastate bank M&As, there are mixed results. Although, mean CARs equal to -0.18% in the three-day event window, in the five-day post-announcement window (1,5), CARs are statistically significant and equal to 0.21%. This result suggests the existence of positive market reaction just after the announcement of intrastate bank M&As.

The comparison between interstate and intrastate bank M&As shows that interstate deals perform lower than the intestate deals across all the applied event windows. In particular, in the five-day (-2,2) event window surrounding the deal announcement, CARs for interstate deals are significantly lower (at the 1% level) by about -0.54% compared to the returns of intrastate deals. Moreover, in the three-day event window (-1,1) CARs for interstate deals are lower by -0.32% compared to the intrastate sub-sample and this result is significant at the 10% level.

Table 25. CARs between interstate and intrastate bank M&A announcements over the period 1986-2020

Event Window	Panel A: Interstate M&As (N=1,353) (1)						Panel B: Intrastate M&As (N=1,754) (2)						Panel C: Test for differences (1)-(2)			
	Mean	Median	Std. Dev	%Pos	BMP	Corrado	Mean	Median	Std. Dev	%Pos	BMP	Corrado	Mean	Median	*t*-test	MWU
Pre-announcement event windows																
[-5,-1]	-0.12	-0.19	3.52	46.2	-1.483	-1.606	0.07	-0.11	3.99	48.3	0.331	-0.283	-0.19	-0.08	1.413	-0.926
[-2,0]	-0.39[a]	-0.34[a]	4.20	44.3	-4.457	-3.167	-0.11[b]	-0.36[b]	4.40	45.2	-2.103	-2.296	-0.28[c]	0.02	1.803	-1.116
Announcement event windows																
[-20,20]	-0.75[b]	-0.96[a]	9.65	44.3	-2.381	-2.595	0.08	-0.51	9.74	48.3	-0.285	-1.474	-0.83[b]	-0.45[b]	2.357	-2.442
[-5,5]	-0.58[a]	-0.63[a]	5.82	43.5	-4.722	-3.137	0.07	-0.08	6.43	49.4	-0.097	-0.167	-0.65[a]	-0.55[a]	2.940	-3.159
[-3,3]	-0.55[a]	-0.53[a]	5.39	43.1	-5.021	-3.024	-0.01	-0.09	5.73	48.8	-0.846	-0.597	-0.54[a]	-0.44[a]	2.701	-2.874
[-2,2]	-0.50[a]	-0.51[a]	5.11	43.4	-5.018	-3.376	0.03	-0.18	5.32	47.9	-0.803	-0.555	-0.54[a]	-0.33[a]	2.849	-3.110
[-1,1]	-0.50[a]	-0.45[a]	4.55	44.1	-5.839	-3.855	-0.18[c]	-0.26[b]	4.77	46.4	-1.962	-2.465	-0.32[c]	-0.19[c]	1.887	-1.920
Post-announcement event windows																
[0,1]	-0.49[a]	-0.39[a]	3.94	43.2	-6.429	-5.214	-0.22[a]	-0.28[a]	4.39	46.0	-2.937	-3.337	-0.26[c]	-0.11[c]	1.745	-1.731
[0,2]	-0.46[a]	-0.41[a]	4.43	43.8	-5.842	-4.011	-0.06[c]	-0.20	4.81	47.2	-1.711	-0.837	-0.39[b]	-0.21[b]	2.371	-2.329
[1,5]	-0.11[b]	-0.25	3.87	47.0	-2.334	-1.169	0.21[b]	0.06[c]	4.64	50.5	2.018	1.897	-0.32[b]	-0.31[a]	2.092	-2.797

Note: This table presents the acquirer's Cumulative Abnormal Returns (CARs) that estimated using the market-adjusted model with the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark. CARs are estimated for the entire period 1986-2020 across alternative event windows. In particular, two pre-announcement windows (i.e. (-5,-1), and (-2,0), five announcement event windows (i.e. (-20, 20), (-5, 5), (-3, 3), (-2, 2), and (-1, 1)) and three post-announcement event windows (i.e. (0, 1), (0, 2), and (1, 5)) are presented. Panel A presents the mean, the median, the standard deviation and the percentage of positive CARs for the sub-sample of interstate deals (N=1,353) whereas Panel B reports the corresponding statistics for the sub-sample of the intrastate deals (N=1,754). The statistical significance of the CARs is assessed using the parametric BMP-test and the non-parametric Corrado-test. Panel C reposts the both the mean and the median differences in CARs between the interstate and the intrastate bank M&As. The statistical significance for the mean and median differences is assessed using the *t*-test and the Mann-Whitney-U (MWU) test., respectively. The superscripts a, b and c denote significance at 1%, 5% and 10% levels, respectively.

Figure 8 presents the daily Cumulative Average Abnormal Returns over the 41day-period centered on the announcement date.

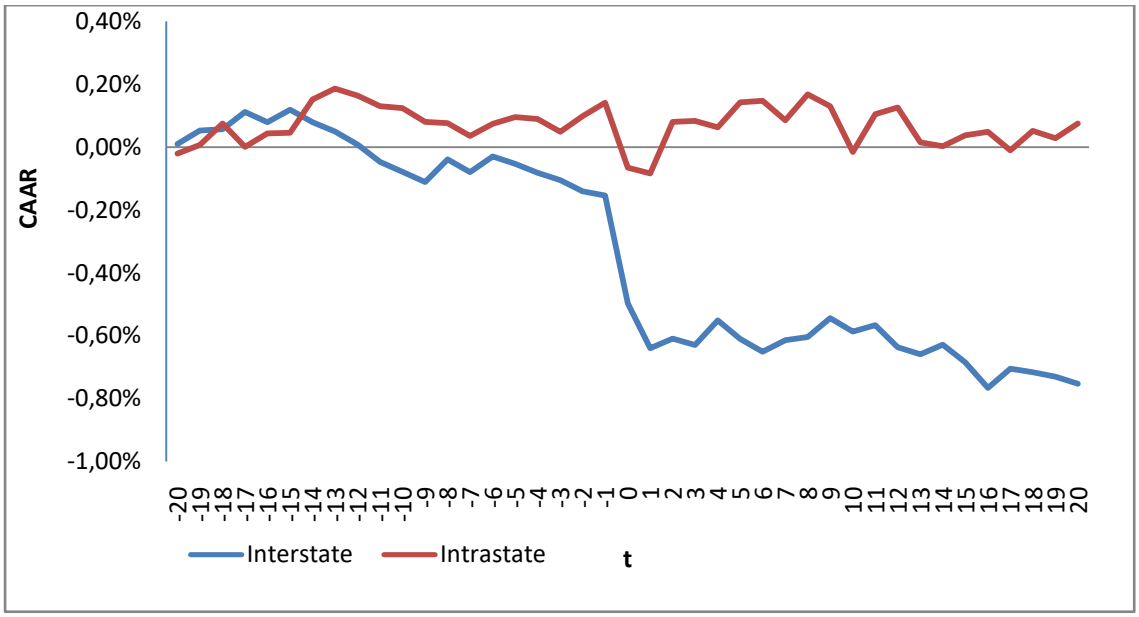

Figure 8. Daily Cumulative Average Abnormal Returns (CAAR) estimated using the market-adjusted model between interstate and intrastate bank M&As over the period 1986-2020

Note: This figure presents the acquirer Cumulative Average Abnormal Returns (CAAR) for the 41-day event window surrounding the announcement date (day 0) during the entire period 1986-2020. CAARs are estimated with the market-adjusted model using the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark. The sample of bank M&As is separated into interstate deals (N=1,353) and intrastate deals (N=1,754).

According to the figure 8, interstate deals underperform the intrastate deals, mainly for CAARs after the -14 day and this result remains unaltered until the day +20 after the M&A announcement.

5.2. Acquirer's shareholder wealth with respect to the M&A industry orientation

With respect to the M&A industry classification, the whole sample is separated into two sub-samples. Industry focused deals are those that involve acquirers and targets that share the same two-digit SIC code. On the other hand, industry diversified deals are M&As between acquirers and targets with different two-digit SIC code. The results are presented in the table 26.

Table 26. CARs between focused and diversified bank M&A announcements over the period 1986-2020

	Panel A: Industry focused M&As (N=2,577) (1)						Panel B: Industry diversified M&As (N=530) (2)						Panel C: Test for differences (1-2)			
Event Window	Mean	Median	Std. Dev	%Pos	BMP	Corrado	Mean	Median	Std. Dev	%Pos	BMP	Corrado	Mean	Median	*t*-test	MWU
Pre-announcement event windows																
[-5-1]	0.00	-0.16	3.69	47.3	-0.421	-0.813	-0.10	-0.13	4.25	47.5	-0.824	-1.635	0.10	-0.03	0.569	-0.106
[-2,0]	-0.22[a]	-0.33[a]	4.21	45.1	-3.653	-3.114	-0.30[a]	-0.44[a]	4.77	43.4	-2.843	-3.051	0.08	0.11	0.399	-0.819
Announcement event windows																
[-20,20]	-0.35[c]	-0.75[a]	9.50	46.4	-1.718	-2.821	0.04	-0.61	10.70	47.2	-0.695	-1.033	-0.39	-0.14	-0.780	-0.593
[-5,5]	-0.19[a]	-0.39[c]	5.99	47.0	-2.630	-1.949	-0.31[c]	-0.31	7.06	45.8	-1.726	-1.529	0.12	-0.08	0.362	-0.003
[-3,3]	-0.24[a]	-0.32[b]	5.48	46.1	-3.355	-2.216	-0.27[b]	-0.25	6.12	47.5	-2.114	-1.521	0.03	-0.07	0.118	-0.111
[-2,2]	-0.22[a]	-0.36[b]	5.11	45.6	-3.391	-2.420	-0.12[c]	-0.25	5.81	47.7	-1.965	-1.605	-0.10	-0.11	-0.385	-0.743
[-1,1]	-0.33[a]	-0.34[a]	4.63	45.4	-4.568	-4.112	-0.29[a]	-0.27[b]	4.89	45.5	-2.769	-2.269	-0.04	-0.07	-0.171	-0.191
Post-announcement event windows																
[0,1]	-0.37[a]	-0.37[a]	4.14	44.4	-5.993	-6.089	-0.19[b]	-0.24[c]	4.46	46.2	-2.492	-1.879	-0.18	-0.13	-0.908	-1.144
[0,2]	-0.26[a]	-0.29[a]	4.55	45.8	-4.833	-3.548	-0.08[b]	-0.29	5.13	45.7	-2.003	-0.668	-0.18	-0.01	-0.831	-0.998
[1,5]	0.07	-0.11	4.15	48.6	-0.347	0.475	0.05	0.05	5.08	50.9	0.769	0.566	0.02	-0.16	0.094	-0.499

Note: This table presents the acquirer's Cumulative Abnormal Returns (CARs) that estimated using the market-adjusted model with the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark. CARs are estimated for the entire period 1986-2020 across alternative event windows. In particular, two pre-announcement windows (i.e. (-5,-1), and (-2,0), five announcement event windows (i.e. (-20, 20), (-5, 5), (-3, 3), (-2, 2), and (-1, 1)) and three post-announcement event windows (i.e. (0, 1), (0, 2), and (1, 5)) are presented. Panel A presents the mean, the median, the standard deviation and the percentage of positive CARs for the sub-sample of industry focused deals (N=2,577) whereas Panel B reports the corresponding statistics for the sub-sample of the industry diversified deals (N=530). The statistical significance of the CARs is assessed using the parametric BMP-test and the non-parametric Corrado-test. Panel C reposts the both the mean and the median differences in CARs between the focused and the diversified bank M&As. The statistical significance for the mean and median differences is assessed using the *t*-test and the Mann-Whitney-U (MWU) test, respectively. The superscripts a, b and c denote significance at 1%, 5% and 10% levels, respectively.

The results in table 26 indicate that the majority of the bank M&As are characterized as industry focused deals (N=2,577). The evaluation of the Cumulative Abnormal returns indicate the existence of negative and significant abnormal returns upon the three-day event window (-1, 1) both for the industry diversified and the industry focused deals. The same pattern is observed across alternative event windows surrounding the deal announcement. The evaluation of the differences in means and median suggests that there is no significant differences in CARs between the industry focused and the industry diversified mergers in the banking sector. To analyze the trend of the wealth effects over the 41-day event window, figure 9 presents the CAARs for the two sub-samples.

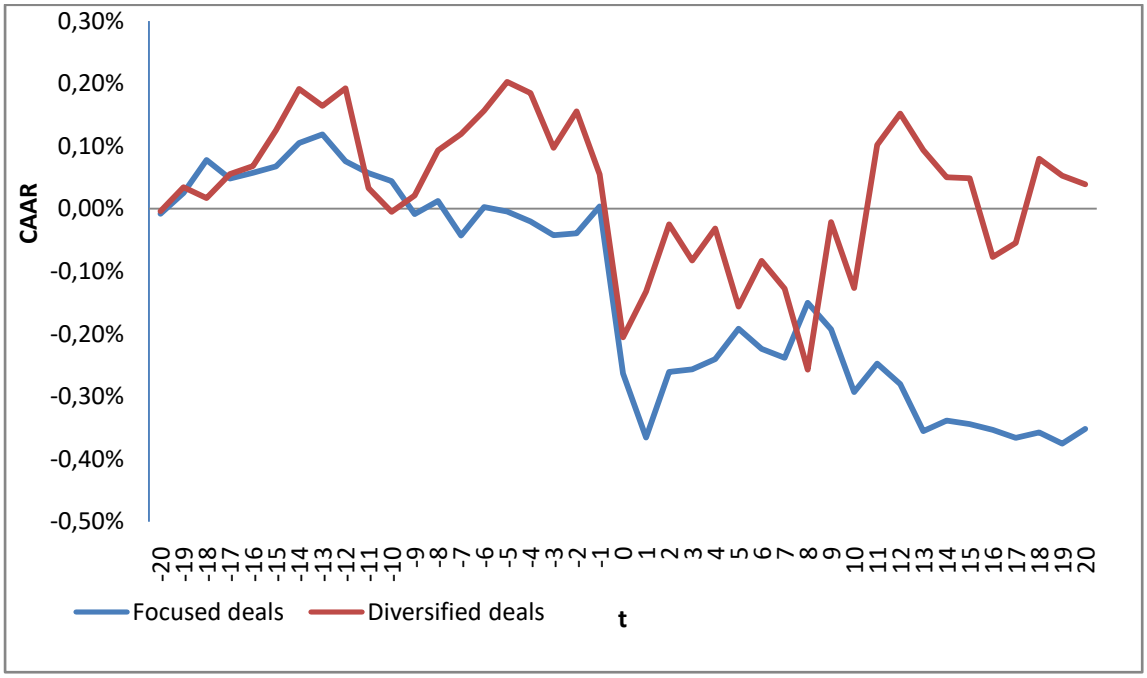

Figure 9. Daily Cumulative Average Abnormal Returns (CAAR) estimated using the market-adjusted model between industry focused and industry diversified bank M&As over the period 1986-2020

This figure presents the acquirer Cumulative Average Abnormal Returns (CAAR) for the 41-day event window surrounding the announcement date (day 0) during the entire period 1986-2020. CAARs are estimated with the market-adjusted model using the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark. The sample of bank M&As is separated into industry focused (N=2,577) and industry diversified deals (N=530).

Figure 9 indicates that CAARs for diversified deals after the +8 day upon the M&A announcement are higher than the CAARs of focused deals. This pattern can be explained by the fact that CARs over the (-20 , 20) window are significantly negative for the industry focused deals (-0.35%) while they are positive but insignificant for the diversified deals (0.04%).

5.3. Acquirer's shareholder wealth with respect to the M&A method of payment

Considering the method of payment, Cumulative Abnormal Returns (CARs) are estimated for stock-only financed deals (N=1,326), for non stock-only financed deals (N=1,781), for cash-only financed deals (N=549), for deals that are financed using a combination (hereafter "combo" deals) of stock and cash (N=535), and for choice financed deals (N=286). Table 27 presents the CARs for the above sub-samples as well as the corresponding tests of significance over the entire period 1986-2020.

The results presented in the table 27 show that stock-only financed deals are associated with negative and significant CARs across nine out of ten alternative event windows. Specifically, in the five-day event window (-2,2) surrounding the deal announcement, CARs equal to -0.60% and are significant at the 1% level using both the BMP-test and the Corrado-test. Considering the market reaction upon the three-day event window centered on the announcement day (-1 , 1), the results suggest negative market reaction given that CARs equal to -0.71%. Therefore, stock-only financed bank mergers destroy acquirer's shareholder wealth. On the other hand, for the rest of the sample (namely for non stock-only financed deals), there are mixed results. Considering the significant CARs, found for short event windows surrounding the deal announcements (i.e. (-2, 0), (-1 ,1) and (0,1)), it follows that there is a significant negative market reaction. However, for the window (1 , 5) there are positive and significant CARs that equal to 0.36%. Given that non stock-only financed deals provide mixed results, this thesis further analyzes the rest sub-categories. With respect to the cash-only financed bank M&As, the results indicate that there is evidence of positive and significant CARs. However, this result is supported only for the 11-day event window (-5.5), the three-day event window starting on the announcement date (0 ,2) as well as for the five-day event window starting immediately after the announcement date (1,5). In particular, for the (1,5) event window CARs are significant and equal to +0.71%.

The results for the sub-sample of combo financed deals provide evidence mainly for insignificant CARs (across nine out of ten event windows), while the results for choice financed deals indicate the existence of significant negative CARs for various event windows surrounding the deal announcement. To evaluate the existence of significant differences in mean and median CARs among bank M&As with alternative means of payment, table 28 presents the results derived from the univariate analysis.

Table 27. Cumulative abnormal returns (CARs) upon M&A announcements with respect to the method of payment over the period 1986-2020

	1. Panel A: Stock-only financed M&As (N=1,326)						2. Panel B: Non stock-only financed M&As (N=1,781)						3. Panel C: Cash-only financed M&As (N=549)					
Event Window	Mean	Median	Std. Dev	%Pos	BMP	Corrado	Mean	Median	Std. Dev	%Pos	BMP	Corrado	Mean	Median	Std. Dev	%Pos	BMP	Corrado
[-5,-1]	0.00	-0.14	3.96	47.8	-0.665	-0.971	-0.03	-0.16	3.66	47.05	-0.374	-0.921	-0.15	-0.23	3.79	45.9	-0.206	-0.455
[-2,0]	-0.35[a]	-0.53[a]	4.46	43.3	-3.257	-3.698	-0.15[a]	-0.25[c]	4.20	45.99	-3.135	-1.947	-0.02	-0.21	3.76	45.7	-0.999	-0.552
[-20,20]	-1.13[a]	-1.36[a]	9.49	44.3	-3.423	-3.621	0.35	-0.36	9.83	48.23	0.467	-0.670	0.77	0.84	9.75	53.7	0.424	0.881
[-5,5]	-0.79[a]	-0.91[a]	6.13	43.0	-4.756	-3.817	0.21	-0.06	6.19	49.69	-0.024	0.297	0.75[c]	0.33[b]	5.68	53.6	1.803	2.048
[-3,3]	-0.66[a]	-0.56[a]	5.41	44.1	-4.252	-3.883	0.07	-0.16	5.70	47.95	-1.547	0.023	0.40	-0.04	5.13	49.5	0.532	1.487
[-2,2]	-0.60[a]	-0.59[a]	5.20	42.5	-4.222	-4.255	0.09	-0.15	5.24	48.51	-1.419	0.062	0.45	-0.09	4.67	49.7	0.475	1.479
[-1,1]	-0.71[a]	-0.61[a]	4.72	41.6	-5.750	-5.824	-0.03[c]	-0.13	4.62	48.18	-1.853	-0.838	0.30	-0.02	4.03	49.5	0.930	1.071
[0,1]	-0.69[a]	-0.57[a]	4.22	41.2	-6.905	-7.085	-0.08[b]	-0.17[c]	4.17	47.39	-2.464	-1.836	0.36	0.02	3.79	50.1	1.595	1.257
[0,2]	-0.71[a]	-0.61[a]	4.54	42.1	-6.672	-5.735	0.12	-0.11	4.71	48.46	-1.038	0.505	0.66[c]	0.29[a]	4.26	54.3	2.676	3.188
[1,5]	-0.32[a]	-0.29[a]	4.17	45.8	-3.478	-2.174	0.36[a]	0.12[b]	4.41	51.38	2.738	2.527	0.71[c]	0.43[a]	4.56	55.2	2.916	3.016

	4. Panel D: Combo financed M&As (N=535)						5. Panel E: Choice financed M&As (N=286)					
	Mean	Median	Std. Dev	%Pos	BMP	Corrado	Mean	Median	Std. Dev	%Pos	BMP	Corrado
[-5,-1]	0.22	-0.11	3.50	48.2	0.592	0.182	-0.23[c]	-0.44	3.35	43.7	-1.802	-1.482
[-2,0]	0.01	-0.08	3.74	48.4	-0.633	-0.073	-0.70[a]	-0.58[a]	4.85	40.9	-3.440	-3.558
[-20,20]	0.29	-0.56	9.27	46.5	-0.188	-0.669	0.27	-0.89	9.27	46.9	0.269	-0.985
[-5,5]	0.68	0.37	6.30	53.6	1.564	1.443	-0.82[a]	-0.87[b]	6.51	39.9	-3.691	-2.134
[-3,3]	0.47	0.15	5.63	51.6	0.889	1.631	-0.70[a]	-1.10[b]	6.26	37.8	-3.580	-2.378
[-2,2]	0.41	0.16[c]	5.04	52.5	1.021	1.651	-0.85[a]	-0.88[a]	5.82	38.5	-3.618	-2.832
[-1,1]	0.04	0.16	4.26	52.7	-0.041	0.480	-0.98[a]	-1.02[a]	5.29	37.1	-4.650	-4.220
[0,1]	-0.09	0.01	4.01	50.7	-0.830	-0.469	-0.99[a]	-0.87[a]	5.34	36.4	-5.031	-5.418
[0,2]	0.27	-0.05	4.71	49.3	0.376	1.444	-0.84[a]	-0.84[a]	5.46	36.7	-4.540	-3.743
[1,5]	0.60[a]	0.41[a]	4.27	54.0	3.257	2.605	0.11	-0.14	4.28	48.6	-0.713	0.954

Note: This table presents the acquirer's Cumulative Abnormal Returns (CARs) that estimated using the market-adjusted model with the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark. CARs are estimated for the entire period 1986-2020 across alternative event windows. In particular, two pre-announcement windows (i.e. (-5,-1), and (-2,0), five announcement event windows (i.e. (-20, 20), (-5, 5), (-3, 3), (-2, 2), and (-1, 1)) and three post-announcement event windows (i.e. (0, 1), (0, 2), and (1, 5)) are presented. Panel A presents the mean, the median, the standard deviation and the percentage of positive CARs for the sub-sample of deals with stock-only mean of payment (N=1,326), Panel B reports the statistics for the sub-sample of non-only stock financed deals (N=1,721), Panel C presents the statistics for cash-only financed deals (N=549), Panel D reports the statistics for combo financed deals (N=535), and Panel E presents the statistics for deals with choice as mean of payment (N=286). The statistical significance of the CARs is assessed using the parametric BMP-test and the non-parametric Corrado-test. The superscripts a, b, and c denote significance at 1%, 5% and 10% levels, respectively.

Table 28. Tests for the mean and median differences with respect to the selected method of payment

Event Window	Panel A: Test for differences (1-2)				Panel B: Test for differences (1-3)				Panel C: Test for differences (1-4)			
	Mean	Median	*t*-test	MWU	Mean	Median	*t*-test	MWU	Mean	Median	*t*-test	MWU
[-5,-1]	0.04	0.02	0.254	-0.115	0.15	0.09	0.757	-0.393	-0.21	-0.03	-1.144	-1.001
[-2,0]	-0.21	-0.28[c]	-1.317	-1.767	-0.34	-0.32[c]	-1.549	-1.784	-0.36[c]	-0.44[b]	-1.647	-2.140
[-20,20]	-1.48[a]	-1.00[a]	-4.213	-3.700	-1.90[a]	-2.20[a]	-3.914	-4.209	-1.43[a]	-0.80[b]	-2.956	-2.387
[-5,5]	-1.00[a]	-0.85[a]	-4.464	-4.510	-1.54[a]	-1.25[a]	-5.060	-5.235	-1.47[a]	-1.29[a]	-4.642	-4.691
[-3,3]	-0.73[a]	-0.40[a]	-3.585	-3.227	-1.06[a]	-0.53[a]	-3.921	-3.552	-1.13[a]	-0.72[a]	-4.024	-4.057
[-2,2]	-0.69[a]	-0.44[a]	-3.635	-3.585	-1.05[a]	-0.50[a]	-4.095	-3.921	-1.01[a]	-0.74[a]	-3.828	-3.891
[-1,1]	-0.68[a]	-0.48[a]	-4.024	-4.454	-1.01[a]	-0.59[a]	-4.668	-4.808	-0.75[a]	-0.77[a]	-3.210	-4.069
[0,1]	-0.61[a]	-0.41[a]	-4.022	-4.301	-1.05[a]	-0.59[a]	-5.292	-5.071	-0.60[a]	-0.59[a]	-2.825	-3.402
[0,2]	-0.83[a]	-0.50[a]	-4.944	-5.012	-1.37[a]	-0.90[a]	-6.224	-6.062	-0.98[a]	-0.55[a]	-4.179	-4.260
[1,5]	-0.68[a]	-0.41[a]	-4.377	-4.330	-1.03[a]	-0.72[a]	-4.752	-4.512	-0.92[a]	-0.70[a]	-4.297	-4.470
	Panel D: Test for differences (1-5)				Panel E: Test for differences (2-4)				Panel F: Test for differences (2-5)			
	Mean	Median	*t*-test	MWU	Mean	Median	*t*-test	MWU	Mean	Median	*t*-test	MWU
[-5,-1]	0.24	0.31	1.047	-0.837	-0.25	-0.05	-1.390	-0.961	0.20	0.28	0.874	-0.968
[-2,0]	0.35	0.05	1.181	-1.600	-0.15	-0.16	-0.761	-0.980	0.56[b]	0.33[a]	2.029	-2.697
[-20,20]	-1.41[b]	-0.47	-2.281	-1.472	0.05	0.20	0.111	-0.237	0.07	0.53	0.120	-0.560
[-5,5]	0.03	-0.04	0.083	-0.593	-0.47	-0.44[c]	-1.538	-1.693	1.03[a]	0.81[a]	2.597	-3.231
[-3,3]	0.05	0.53	0.127	-1.104	-0.40	-0.32[c]	-1.437	-1.920	0.77[b]	0.93[a]	2.095	-3.068
[-2,2]	0.25	0.29	0.720	-1.345	-0.32	-0.31	-1.257	-1.534	0.94[a]	0.73[a]	2.766	-3.559
[-1,1]	0.27	0.41[c]	0.852	-1.799	-0.07	-0.28	-0.329	-1.108	0.95[a]	0.89[a]	3.153	-4.517
[0,1]	0.31	0.30[c]	1.056	-1.766	0.01	-0.18	0.045	-0.498	0.92[a]	0.70[a]	3.309	-4.389
[0,2]	0.13	0.23	0.427	-1.225	-0.15	-0.05	-0.650	-0.838	0.96[a]	0.73[a]	3.136	-4.264
[1,5]	-0.43	-0.15	-1.590	-1.446	-0.24	-0.29	-1.111	-1.430	0.25	0.26	0.893	-0.997

Note: This table reports the results of mean and median differences in acquirer's CARs with respect to the selected method of payment as presented in the Table 20. In particular, differences in CARs between alternative combinations of the sub-samples are presented. The statistical significance for the mean and median differences is assessed using the *t*-test and the Mann-Whitney-U (MWU) test, respectively. The superscripts a, b and c denote significance at 1%, 5% and 10% levels, respectively. 1: Stock-only financed M&As (N=1,326), 2: Non stock-only financed M&As (N=1,781), 3: Cash-only financed M&As (N=549), 4: Combo financed M&As (N=535), and 5: Choice financed M&As (N=286).

The results presented in the table 28 suggest that there are significant differences with respect to the selected methods of M&A payment. Results in Panel A provide evidence for significant differences in both mean and median CARs between stock-only financed and not stock-only financed bank M&As. Specifically, for the three-day event window (-1, 1) stock-only financed deals present significantly lower abnormal returns by about -0.68% compared to the returns of the not stock-only financed deals.

In the Panel B of table 28 there is evidence for significant differences in CARs between stock-financed deals and cash-financed deals. In particular, bank acquirers that engage in mergers with the selection of stock-only financed deals present statistically significant lower CARs compared to the banks that engage in cash-only financed deals. For the three-day event window (-1,1) stock financed deals present significantly lower returns by about -1.01% compared to the cash financed deals.

In Panel C we observe that acquirer's CARs for stock-only financed deals are significantly lower compared to CARs for combo financed deals. Specifically, in the three-day event window (-1,1) surrounding the deal announcement acquirers of stock-financed deals had significantly lower returns about -1.01% compared to the acquirers that select combo-financed deals. Moreover, cash-financed deals perform better compared to the choice financed deals (Panel E). In the three-day event window, acquirers that use only cash as method of payment are associated with significantly higher (by about 0.95%) returns compared to the acquirers that use choice financed deals.

To further analyze the differences in the acquirer's wealth among deals with alternative payment methods, figure 10 reports the CAARs over the 41-day period. Based on this plot, for the 41-day event window CAARs for cash-only financed deals are higher compared to the rest means of payment. Specifically, on the day 0 there is a positive reaction for bank M&As which paid by cash, whereas there is a negative reaction for stock-only financed and for choice financed deals. On the announcement date and/or thereafter, stock-only financed deals present lower returns compared to the other forms of payment.

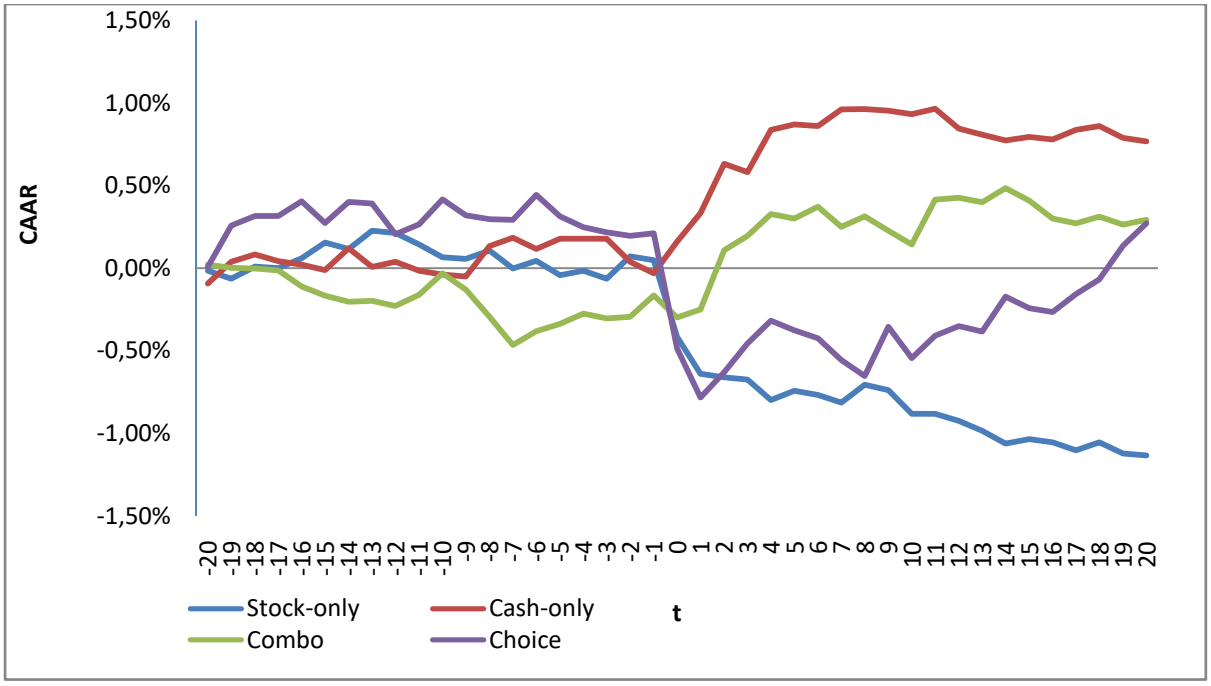

Figure 10. Daily Cumulative Average Abnormal Returns (CAAR) estimated using the market-adjusted model with respect to the selected method of M&A payment over the period 1986-2020

This figure presents the acquirer Cumulative Average Abnormal Returns (CAAR) for the 41-day event window surrounding the announcement date (day 0) during the entire period 1986-2020. CAARs are estimated with the market-adjusted model using the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark. The sample of bank M&As is separated into four groups that include stock-only financed M&As (N=1,326), cash-only financed M&As (N=519), combo financed M&As (N=535) and Choice financed M&As (N=286).

5.4. Acquirer's shareholder wealth with respect to the target public status

The target listing status constitutes a factor that affects the valuation effects of M&As. With respect to the target public status, the sample is separated into two groups: (a) the acquisitions of public targets (N=1,537), and (b) the acquisitions of non-public targets (N=1,570). Acquisitions of non-public target may contain acquisitions of private targets (N=1,291), acquisition of subsidiaries (N=270) and acquisitions of mutual firms[22] (N=9). Table 29 presents the CARs and the tests assessing their significance.

[22] As "mutual companies" are characterized those companies in which the ownership and the profits are distributed in accordance with the amount of business they do with the firm. Given that only nine M&As from the total sample refer to the acquisition of mutual firms, there is not a separate estimation of CARs for those deals.

Table 29. Cumulative abnormal returns upon M&A announcements with respect to the target public status

Event Window	1. Panel A: Acquisitions of public targets (N=1,537)						2. Panel B: Acquisitions of non-public targets (N=1,570)						3. Panel C: Acquisitions of private targets (N=1,291)					
	Mean	Median	Std. Dev	%Pos	BMP	Corrado	Mean	Median	Std. Dev	%Pos	BMP	Corrado	Mean	Median	Std. Dev	%Pos	BMP	Corrado
[-5,-1]	0.01	-0.17	3.71	47.10	-0.731	-0.853	-0.05	-0.14	3.88	47.6	-0.280	-0.978	-0.01	-0.14	3.85	47.6	-0.431	-0.926
[-2,0]	-0.63[a]	-0.67[a]	4.91	40.79	-6.168	-4.944	0.15	-0.07	3.60	48.8	0.416	0.343	0.20	-0.01	3.53	49.9	1.187	0.731
[-20,20]	-1.19[a]	-1.90[a]	9.66	41.31	-4.032	-3.335	0.60	0.34	9.69	51.7	1.431	-0.150	0.52	0.27	9.45	51.7	0.839	-0.538
[-5,5]	-1.11[a]	-1.08[a]	6.50	39.95	-7.310	-4.270	0.66[a]	0.36[c]	5.72	53.6	3.339	1.851	0.65[a]	0.34	5.54	53.3	2.751	1.491
[-3,3]	-1.05[a]	-1.04[a]	5.99	39.43	-8.038	-4.954	0.55[a]	0.29[b]	5.04	53.1	3.084	2.328	0.52[a]	0.29[c]	4.76	53.0	2.758	1.921
[-2,2]	-0.98[a]	-0.92[a]	5.66	39.04	-8.031	-5.334	0.56[a]	0.21[b]	4.67	52.7	3.276	2.475	0.54[a]	0.20[b]	4.36	52.7	3.442	2.201
[-1,1]	-1.01[a]	-0.96[a]	5.24	37.93	-9.433	-7.194	0.36[a]	0.17[b]	3.93	52.7	3.233	2.375	0.32[a]	0.16[c]	3.60	52.4	2.782	1.693
[0,1]	-1.10[a]	-0.87[a]	4.62	36.50	-11.761	-9.749	0.41[a]	0.15[a]	3.59	52.8	4.859	3.200	0.35[a]	0.15[b]	3.28	52.7	4.216	2.430
[0,2]	-1.09[a]	-0.93[a]	4.89	38.06	-11.205	-7.595	0.61[a]	0.18[a]	4.25	53.2	5.864	4.232	0.51[a]	0.14[a]	3.84	52.6	5.065	3.258
[1,5]	-0.38[a]	-0.33	4.26	46.00	-4.991	-2.017	0.51[a]	0.16[a]	4.34	51.9	5.497	2.729	0.49[a]	0.12[b]	3.98	51.3	4.910	2.300

	4. Panel D: Acquisitions of subsidiaries (N=270)						5. Panel E: Test for differences (1-2)				6. Panel F: Test for differences (1-3)			
	Mean	Median	Std. Dev	%Pos	BMP	Corrado	Mean	Median	*t*-test	MWU	Mean	Median	*t*-test	MWU
[-5,-1]	-0.27	-0.20	4.01	47.4	0.050	-0.514	0.06	-0.03	0.454	-0.344	0.03	-0.03	0.184	-0.356
[-2,0]	-0.10[c]	-0.49	3.92	43.7	-1.663	-0.928	-0.77[a]	-0.59[a]	-4.995	-6.289	-0.82[a]	-0.66[a]	-5.180	-6.529
[-20,20]	0.97	0.65	10.73	51.5	1.479	0.711	-1.80[a]	-2.23[a]	-5.180	-6.003	-1.71[a]	-2.17[a]	-4.732	-5.524
[-5,5]	0.68[c]	0.36	6.54	54.4	1.760	1.053	-1.77[a]	-1.43[a]	-8.063	-8.941	-1.75[a]	-1.41[a]	-7.755	-8.502
[-3,3]	0.69	0.31	6.21	53.3	1.373	1.336	-1.61[a]	-1.34[a]	-8.092	-9.733	-1.58[a]	-1.34[a]	-7.805	-9.311
[-2,2]	0.63	0.17	5.88	51.9	0.405	1.116	-1.53[a]	-1.13[a]	-8.231	-9.770	-1.52[a]	-1.12[a]	-8.047	-9.406
[-1,1]	0.52	0.19[c]	5.26	53.3	1.446	1.917	-1.37[a]	-1.13[a]	-8.211	-10.678	-1.33[a]	-1.12[a]	-7.936	-10.075
[0,1]	0.67[b]	0.11[b]	4.83	53.7	2.340	2.479	-1.51[a]	-1.01[a]	-10.169	-11.987	-1.46[a]	-1.02[a]	-9.775	-11.176
[0,2]	1.08[a]	0.44[a]	5.83	56.7	2.884	3.243	-1.70[a]	-1.11[a]	-10.355	-11.450	-1.61[a]	-1.07[a]	-9.778	-10.523
[1,5]	0.60[b]	0.32	5.74	54.8	2.351	1.485	-0.89[a]	-0.50[a]	-5.762	-5.273	-0.87[a]	-0.45[a]	-5.558	-4.949

Note: This table presents the acquirer's Cumulative Abnormal Returns (CARs) that estimated using the market-adjusted model with the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark. CARs are estimated for the entire period 1986-2020 across alternative event windows. In particular, two pre-announcement windows (i.e. (-5,-1), and (-2,0), five announcement event windows (i.e. (-20, 20), (-5, 5), (-3, 3), (-2, 2), and (-1, 1)) and three post-announcement event windows (i.e. (0, 1), (0, 2), and (1, 5)) are presented. Panel A presents the mean, the median, the standard deviation and the percentage of positive CARs for the sub-sample of acquisitions of public targets (N=1,537), Panel B reports the statistics for the sub-sample of acquisitions of non-pubic targets (N=1,570), Panel C reports the statistics for the sub-sample of acquisitions of private targets (N=1,291), and Panel D reports the statistics for the sub-sample of acquisitions of subsidiaries (N=270). The statistical significance of the CARs is assessed using the parametric BMP-test and the non-parametric Corrado-test. Panel E and F report the mean and median differences in CARs with respect to the target public status. The statistical significance for the mean and median differences is assessed using the *t*-test and the Mann-Whitney-U (MWU) test, respectively. The superscripts a, b, and c denote significance at 1%, 5%, and 10% levels, respectively.

The results presented in table 29 show the existence of negative and significant abnormal returns for the acquisition of public targets. Results from Panel 4 suggest the existence of negative and significant CARs for nine out of ten applied event windows. Specifically, acquirer's CARs for the three-day (-1,1) event window surrounding the deal announcement equal to -1.01% and are significant at the 1% level whereas across this event-window only the 37.93% of the bank M&As create shareholder value.

Panel B reports the valuation effects for the acquisition of non-listed targets. CARs are positive and significant across seven out of ten event windows. For the three-day event window there is a 0.36% value creation for acquirers of non-listed targets.

To further analyze the acquisitions of non-listed targets, Panel C presents the wealth effects for acquisitions of private targets. The results indicate that in the three-day event window (-1,1) acquirers gain about 0.32% whereas in the eleven-day event window (-5,5) acquirers earn about 0.65%. The acquisition of subsidiaries is also associated with mixed wealth effects; however the two-day event window starting on the announcement date (0,1) is positive (0.67%) and significant.

The results derived from the Panel E show that acquirers of public targets earned significantly lower returns compared to the acquirers of non-listed targets. Specifically, in the three-day event window (-1,1) CARs for bank acquisitions of public targets are –1.37% lower compared to the CARs for acquisitions of non-public targets. In Panel F, the comparison between acquisitions of public targets and acquisitions of private targets suggest that acquirers of public targets present also significantly lower abnormal returns compared to the acquirers of private targets. For the three-day event window, acquirers of public targets earned lower by -1.33% returns than the acquirers of private targets. Figure 11 plots the CAARs over the 41-day event window surrounding the announcement of bank M&As.

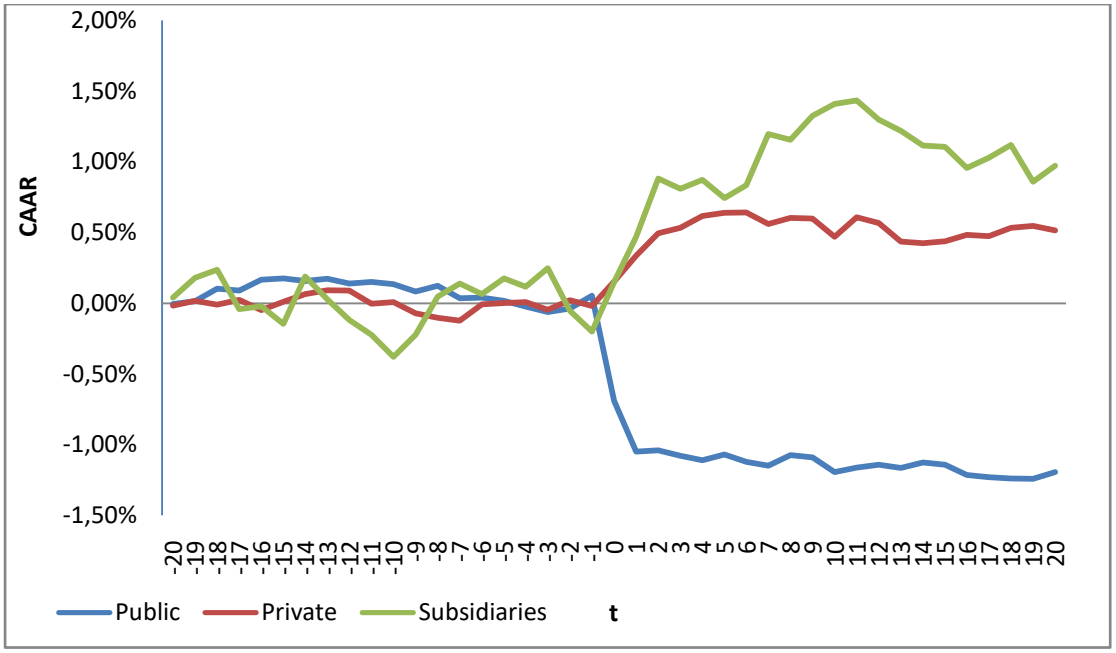

Figure 11. Daily Cumulative Average Abnormal Returns (CAAR) upon M&A announcements estimated using the market-adjusted model with respect to the target public status over the period 1986-2020

This figure presents the Cumulative Average Abnormal Returns (CAAR) for the 41-day event window surrounding the announcement date (day 0) during the entire period 1986-2020. CAARs are estimated with the market-adjusted model using the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark. The sample of bank M&As is separated into three groups that include acquisitions of public targets (N=1,537), acquisitions of private targets (N=1,291) and acquisitions of subsidiaries (N=270).

According to the figure 11, although over the period (-20, -1) CAARs are similar for the acquirers irrespective of the target listing status, over the period (0, 20) there are changes in the pattern of the CAARs. In particular, upon the announcement date (day 0) and thereafter, acquirers of public targets (blue line) underperform compared to the acquirers of private targets (red line). Moreover, in the (-20,20) event window, acquirers of subsidiaries (green line) present the highest performance compared to the rest of acquirers.

5.5. Determinants of acquirer's value upon bank M&A announcements

Prior studies highlighted the effect of various acquirer-specific and deal-specific characteristics on the short-run performance from M&As (for more details see section 3.6.2). To analyze the determinants of acquirers' value, table 30 presents the results derived from the multivariate analysis using the three-day CAR as the dependent variable and a set of both bank-specific and deal-specific control variables. Across the models 1-4, the CARs are estimated using the market adjusted model. Across the models 5-8, the CARs are estimated using the market model whereas across the rest of the models (9-12 models) the CARs are estimated using the four-factor model.

Table 30. Determinants of acquirer's short-run performance upon bank M&As: A cross-sectional analysis using alternative asset pricing models

	Panel A: Market adjusted model				Panel B: Market model				Panel C: Four-factor model			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Total Assets	-0.001	-0.001	-0.001	-0.001	0.000	0.000	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	[0.0008]	[0.0008]	[0.0008]	[0.0008]	[0.0007]	[0.0008]	[0.0008]	[0.0008]	[0.0007]	[0.0008]	[0.0007]	[0.0008]
	(-0.70)	(-0.99)	(-0.92)	(-1.20)	(-0.55)	(-0.63)	(-0.82)	(-0.85)	(-1.13)	(-1.28)	(-1.26)	(-1.40)
AGE	-0.003[b]	-0.002[b]	-0.004[a]	-0.004[a]	-0.003[b]	-0.002[b]	-0.004[a]	-0.004[a]	-0.002[b]	-0.002[b]	-0.004[a]	-0.004[a]
	[0.0010]	[0.0011]	[0.0011]	[0.0011]	[0.0010]	[0.0010]	[0.0010]	[0.0011]	[0.0010]	[0.0010]	[0.0010]	[0.0011]
	(-2.58)	(-2.10)	(-3.91)	(-3.34)	(-2.57)	(-2.30)	(-3.90)	(-3.50)	(-2.48)	(-2.13)	(-3.84)	(-3.34)
Return on Assets	0.003	0.003	0.005[c]	0.005[c]	0.004	0.004	0.005[c]	0.005[c]	0.004	0.004	0.006[b]	0.006[b]
	[0.0026]	[0.0027]	[0.0027]	[0.0028]	[0.0026]	[0.0026]	[0.0026]	[0.0027]	[0.0025]	[0.0026]	[0.0026]	[0.0026]
	(1.30)	(1.28)	(1.77)	(1.80)	(1.45)	(1.43)	(1.95)	(1.94)	(1.56)	(1.55)	(2.30)	(2.26)
Reserve for Loan Losses % Total Loans	0.002[c]	0.002	0.002[c]	0.002	0.001	0.001	0.002	0.001	0.002	0.001	0.002[c]	0.001
	[0.0010]	[0.0011]	[0.0011]	[0.0012]	[0.0010]	[0.0011]	[0.0011]	[0.0012]	[0.0010]	[0.0010]	[0.0011]	[0.0012]
	(1.79)	(1.56)	(1.86)	(1.41)	(1.49)	(1.18)	(1.62)	(1.07)	(1.57)	(1.28)	(1.77)	(1.19)
Total Debt % Common Equity	0.000	0.000	0.000	0.000	0.000	0.000	0.000[c]	0.000[c]	0.000	0.000	0.000	0.000[c]
	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]
	(0.03)	(0.36)	(1.51)	(1.56)	(0.27)	(0.50)	(1.73)	(1.65)	(0.12)	(0.49)	(1.64)	(1.67)
Total Loans % Total Assets	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]
	(0.19)	(1.24)	(-0.26)	(0.88)	(0.36)	(1.32)	(-0.15)	(0.89)	(0.59)	(1.55)	(0.13)	(1.22)
Price-to-Book	-0.003[b]	-0.003[b]	-0.001	-0.001	-0.004[a]	-0.004[a]	-0.002	-0.002	-0.004[a]	-0.004[a]	-0.003[c]	-0.003
	[0.0014]	[0.0014]	[0.0017]	[0.0017]	[0.0014]	[0.0014]	[0.0017]	[0.0017]	[0.0013]	[0.0014]	[0.0016]	[0.0017]
	(-2.16)	(-2.24)	(-0.46)	(-0.34)	(-2.63)	(-2.73)	(-1.04)	(-0.97)	(-3.05)	(-3.12)	(-1.70)	(-1.56)
Relative Deal Size	-0.009[c]	-0.010[b]	-0.009[c]	-0.010[b]	-0.009[c]	-0.010[c]	-0.009[c]	-0.010[b]	-0.010[c]	-0.011[b]	-0.010[b]	-0.011[b]
	[0.0051]	[0.0052]	[0.0050]	[0.0051]	[0.0050]	[0.0051]	[0.0049]	[0.0050]	[0.0049]	[0.0050]	[0.0049]	[0.0050]
	(-1.79)	(-1.99)	(-1.87)	(-2.01)	(-1.73)	(-1.90)	(-1.88)	(-1.99)	(-1.96)	(-2.15)	(-2.12)	(-2.24)

Stock-only financed deals	-0.004[b]	-0.003[c]	-0.002	-0.001	-0.004[b]	-0.003[b]	-0.002	-0.001	-0.003[b]	-0.002	-0.001	-0.001
	[0.0015]	[0.0016]	[0.0017]	[0.0018]	[0.0015]	[0.0015]	[0.0017]	[0.0017]	[0.0014]	[0.0015]	[0.0017]	[0.0017]
	(-2.42)	(-1.87)	(-0.88)	(-0.66)	(-2.52)	(-2.02)	(-1.01)	(-0.83)	(-2.09)	(-1.48)	(-0.62)	(-0.38)
Intrastate deals	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000
	[0.0015]	[0.0016]	[0.0015]	[0.0016]	[0.0015]	[0.0016]	[0.0015]	[0.0016]	[0.0015]	[0.0015]	[0.0014]	[0.0015]
	(0.37)	(0.21)	(0.29)	(0.10)	(0.39)	(0.29)	(0.30)	(0.22)	(0.34)	(0.08)	(0.28)	(0.04)
Industry focused deals	0.002	0.002	0.001	0.002	0.002	0.002	0.001	0.001	0.002	0.002	0.001	0.001
	[0.0020]	[0.0020]	[0.0020]	[0.0020]	[0.0019]	[0.0019]	[0.0019]	[0.0020]	[0.0019]	[0.0019]	[0.0019]	[0.0019]
	(1.08)	(1.12)	(0.74)	(0.81)	(0.80)	(0.97)	(0.36)	(0.59)	(0.84)	(0.94)	(0.52)	(0.66)
Public Targets	-0.011[a]	-0.010[a]	-0.011[a]	-0.011[a]	-0.011[a]	-0.010[a]	-0.011[a]	-0.011[a]	-0.011[a]	-0.009[a]	-0.011[a]	-0.010[a]
	[0.0015]	[0.0016]	[0.0015]	[0.0016]	[0.0015]	[0.0015]	[0.0015]	[0.0015]	[0.0014]	[0.0015]	[0.0014]	[0.0015]
	(-7.48)	(-6.33)	(-7.64)	(-6.65)	(-7.65)	(-6.64)	(-7.78)	(-6.90)	(-7.56)	(-6.35)	(-7.62)	(-6.52)
Constant	0.034[b]	0.033[c]	0.035[b]	0.036[c]	0.031[c]	0.028	0.033[c]	0.031[c]	0.037[b]	0.034[b]	0.037[b]	0.034[b]
	[0.0160]	[0.0172]	[0.0173]	[0.0184]	[0.0158]	[0.0169]	[0.0171]	[0.0181]	[0.0153]	[0.0164]	[0.0164]	[0.0173]
	(2.12)	(1.93)	(2.03)	(1.95)	(1.94)	(1.63)	(1.96)	(1.73)	(2.43)	(2.08)	(2.23)	(1.98)
State Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Year Fixed Effects	No	No	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes
N	2759	2759	2759	2759	2759	2759	2759	2759	2759	2759	2759	2759
R^2	0.0467	0.0696	0.0805	0.1025	0.0485	0.0726	0.0757	0.0993	0.0512	0.0777	0.0813	0.1063
Mean VIF	1.29	1.63	2.45	2.12	1.29	1.63	2.45	2.12	1.29	1.63	2.45	2.12

Note: This table reports the results derived from OLS regression models for the determinants of value creation upon bank M&A announcements. The dependent variable is the three-day (-1,1) acquirer's Cumulative Abnormal Returns (-1,1). The independent variables that are used in the cross-sectional analysis include bank-specific and deal-specific characteristics and are described in the Table 3. CARs are estimated using alternative asset pricing models and specifically in Panel A the CARs are estimated with the market-adjusted model using the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark, in Panel B the CARs are estimated with the market model using the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark, whereas in Panel C the CARs are estimated with the Carhart four-factor model. To enhance the validity of the results, alternative regression models are applied without fixed effects (columns 1,5 and 9), with only state-fixed effects (columns 2, 6, and 10), with only year-fixed effects (columns 3, 7, and 11) as well as with both state- and year-fixed effects (columns 4, 8, and 12). The coefficients derived from the regression analysis are reported in the first row of each independent variable. Standard errors are clustered using the two-way clustered method both at bank and at year level and are presented in brackets, whereas, *t*-values are estimated using the double-clustering method and are reported in parentheses. All variables are winsorized at the 1% and the 99% levels. The superscripts a, b and c denote significance at 1%, 5%, and 10% levels, respectively.

According to the results presented in the table 30, several bank-specific and deal-specific variables affect the short-run performance of bank M&As, irrespectively of the applied asset pricing model. The acquirer's size, measured by the natural logarithm of total acquirer's total assets, has insignificant impact on the acquirer's announcement CARs across all the applied models. Prior studies showed that acquirer's size was negatively associated with acquirer's announcement CARs (Adra et al., 2020; Alexandridis et al., 2017; Cai et al., 2022; Masulis et al., 2007; Moeller et al., 2004). However, in line with Leledakis et al., (2021) we confirm that acquirer's size has no explanatory power on the value creation from bank M&As.

The acquirer's age is measured by the bank's trading history and reflects the level of information that is provided to the market participants. Higher age constitutes an indication for lower information asymmetry/uncertainty. The results provide robust evidence that AGE is negatively associated with acquirer's CARs, implying that banks with longer trading history experience lower gains upon the M&A announcements. Therefore, acquirers with lower levels of information uncertainty (i.e. acquirers with high age) are associated with lower wealth effects upon the announcement of bank M&As. This negative association between acquirer's CARs and acquirer's AGE is consistent with the results from previous studies (Barbopoulos and Sudarsanam, 2012; Draper and Paudyal, 2008); however, contradict the results of Jenter and Lewellen (2015) who found positive relationship between acquirer's age and gains from M&As.

The pre-acquisition operating performance of acquirers, measured by the Return on Assets ratio, is also examined as potential determinant for the value creation upon M&As. The results show that there is a positive impact of ROA on the acquirer's CARs which is statistically significant only in models with year fixed effects or with both state and year fixed effects. This partial evidence of positive relationship suggests that banks with higher operating performance tend to engage in deals with higher acquisition gains, compared to banks with lower levels of operating performance. For the U.S. banking sector prior research also supported the insignificant impact of ROA on acquirer's CARs (Leledakis et al., 2021). There is also partial evidence that CARs are positively affected by both the acquirer's pre-acquisition default risk and the acquirer's pre-acquisition leverage. Considering the positive association between leverage and CARs, Alexandridis et al. (2017) also found positive impact of leverage on acquirer's CARs which was turned to insignificant by the inclusion of firm-fixed effects in the regression models. With respect to the bank's asset structure, the results indicate that acquirer's total loans to total assets ratio has an insignificant impact on the shareholder wealth upon the announcement of bank M&As.

Acquirer's Price-to-Book ratio, which reflects the growth opportunities, has a negative and significant impact on the acquirer's value. Therefore, overvalued

acquirers tend to experience lower gains from bank M&As. This result holds mainly in models without fixed-effects or in models with only state fixed effects. The negative association between price-to-book ratio and acquirer's announcement CARs was also supported by the findings of Andriosopoulos et al. (2016), Barbopoulos and Sudarsanam (2012), Dong et al., (2006), and Sudarsanam and Mahate (2003).

With respect to the deal-specific characteristics, there is evidence for negative association between relative deal size and acquirer's announcement CARs. Therefore, the announcement of bank M&As with large relative size are associated with lower acquisition gains, compared to the announcement of ban M&As with small relative size. Therefore, bidding banks which engage in large deals (compared to their market value of equity) experience significantly lower announcement returns. This negative association between relative deal size and acquirer's CARs is consistent with previous studies (Alexandridis et al., 2013; Bouwman et al., 2009).

Moreover, acquirer's CARs are negatively affected by the selection of stock-only financed deals; however, this result is statistically significant across five out of twelve regression models and it not holds in models that include fixed effects at both state and year level. The negative association between the selection of stock-financed acquisitions and acquirer's value was supported by prior studies (Fuller et al., 2002). However, recent studies showed that the choice of payment had no explanatory power on acquirer's CARs (Golubov et al., 2016) and that the value destruction upon stock-financed M&As was presented in pre-2009 period, whereas over the 2010-2015 period the impact of stock-financed deals on the acquirer's returns was insignificant (Alexandridis et al., 2017).

The intrastate dummy has insignificant impact on the acquirer's CARs, suggesting that the short-run performance upon M&As is irrelevant to whether the M&As are intrastate or interstate deals. Industry focused deals have also insignificant impact on the acquirer's CARs. Therefore, the acquisition of targets with the same two-digit CODE is not associated with gains which can be explained by the sample selection procedure (both bidder and targets belong generally to the banking sector).

The results also provide conclusive evidence that the acquisition of public targets is negatively associated with acquirer's CARs. Therefore, acquirers experience statistically significant lower announcement returns upon the acquisition of listed target and this result is significant at the 1% level across all the applied regression models. After controlling for other firm-specific and deal-specific characteristics and even applied alternative asset pricing models, the acquisition of public targets has a negative impact on the acquirer's announcement performance with a coefficient that varies from -0.011 to -0.009. This result is consistent with the findings from prior studies (Alexandridis et al., 2017; Cai et al., 2022; Dong and Doukas, 2021) and has been also presented for the U.S. bank M&As (Leledakis et al., 2021).

5.6. Determinants of acquirer's BHARs upon bank M&A announcements

The long-run performance is measured with the Buy-and-Hold Abnormal Returns (BHARs) using the CRSP value weighted index as proxy for the benchmark portfolio. The BHARs are estimated across alterative holding periods after the deal completion (effective date). In this section, the determinants of the long-run performance are investigated using as dependent variable the BHARs over the one-year (Panel A), the two-year (Panel B), and the three-year (Panel C) holding period.

The results derived from the cross-sectional analyses are presented in the table 31. The acquirer's size is negatively associated with the long-run performance after the deal completion suggesting that acquirers with large size experienced lower long-run performance compared to the performance of acquirers with small size. However, the significant association is present across six out of 12 regression models. Over the three-year holding period, after controlling both for year- and state- fixed effects, the acquirer's size is negatively associated with acquirer's BHARs. The negative impact of size on acquirer's BHARs is also found by Ferris and Sainani (2021) and Cui and Chi-Moon Leung (2020), whereas Nguyen and Phan (2017) showed insignificant impact of acquirer's size on the long-run acquirer performance.

The acquirer's age has insignificant impact on the acquirer's BHARs. Although age is negatively associated with the short-run performance, it has no explanatory power on the bidder long-run performance. Nguyen and Phan (2017) also found insignificant impact of age on both the one-year and three-year acquirer's BHAR.

The pre-acquisition acquirer's performance, measured by ROA, has a partial positive impact on the acquirer's BHARs and specifically on the one-year and the two-year BHARs. This result is consistent with the findings of Nguyen and Phan (2017) who indicated that the past twelve-month return had positive impact on acquirer's BHARs. Considering the impact of acquirer's risk on the long-run performance, the results showed that the risk has a positive impact on acquirer's BHARs across eight out of twelve regression models. This association between risk and M&A performance is present both in short-run and in the long-run.

The acquirer's leverage has a partial positive impact on the one-year acquirer's BHARs whereas it has insignificant impact on both the two-year and the three-year BHARs. The positive impact of leverage on BHARs was also supported by Wan et al. (2021) whereas the insignificant impact on leverage on BHARs was supported by the prior studies of Doukas and Zhang (2021), Guo et al. (2019), and Nguyen et al. (2020).

Table 31 Determinants of acquirer's long-run performance upon bank M&As: A cross-sectional analysis using Buy-and-Hold Abnormal Returns (BHARs) across various holding periods

	Panel A: BHARs for 1-year period				Panel B: BHARs for 2-year period				Panel C: BHARs for 3-year period			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Total Assets	-0.009[c]	-0.015[b]	0.001	-0.003	-0.008	-0.022[c]	-0.003	-0.014	-0.028[c]	-0.052[a]	-0.010	-0.029[b]
	[0.0055]	[0.0060]	[0.0046]	[0.0051]	[0.0110]	[0.0112]	[0.0093]	[0.0096]	[0.0158]	[0.0157]	[0.0130]	[0.0135]
	(-1.71)	(-2.49)	(0.18)	(-0.56)	(-0.68)	(-1.96)	(-0.29)	(-1.43)	(-1.78)	(-3.30)	(-0.79)	(-2.16)
AGE	-0.008	-0.002	0.004	0.010	-0.026	-0.010	-0.004	0.013	-0.032	-0.011	0.001	0.029
	[0.0089]	[0.0095]	[0.0075]	[0.0078]	[0.0179]	[0.0178]	[0.0141]	[0.0141]	[0.0259]	[0.0250]	[0.0190]	[0.0187]
	(-0.87)	(-0.19)	(0.59)	(1.30)	(-1.47)	(-0.56)	(-0.28)	(0.89)	(-1.25)	(-0.44)	(-0.06)	(1.56)
Return on Assets	0.071[a]	0.073[a]	0.003	0.006	0.098[a]	0.093[b]	0.021	0.016	0.040	0.030	0.014	0.006
	[0.0194]	[0.0196]	[0.0167]	[0.0174]	[0.0374]	[0.0374]	[0.0307]	[0.0312]	[0.0527]	[0.0523]	[0.0430]	[0.0426]
	(3.63)	(3.72)	(0.16)	(0.36)	(2.63)	(2.48)	(0.68)	(0.51)	(0.77)	(0.58)	(0.32)	(0.14)
Reserve for Loan Losses % Total Loans	0.031[a]	0.027[a]	0.005	0.002	0.058[a]	0.046[a]	0.027[b]	0.019	0.119[a]	0.111[a]	0.041[c]	0.033
	[0.0088]	[0.0090]	[0.0076]	[0.0079]	[0.0163]	[0.0157]	[0.0136]	[0.0132]	[0.0264]	[0.0238]	[0.0231]	[0.0206]
	(3.46)	(3.04)	(0.62)	(0.25)	(3.53)	(2.93)	(1.97)	(1.46)	(4.50)	(4.67)	(1.79)	(1.61)
Total Debt % Common Equity	0.000[b]	0.000[b]	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	[0.0001]	[0.0001]	[0.0000]	[0.0000]	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0002]	[0.0002]	[0.0001]	[0.0001]
	(2.37)	(2.58)	(-0.42)	(-0.22)	(0.70)	(0.67)	(0.77)	(0.65)	(0.60)	(0.32)	(0.89)	(0.64)
Total Loans % Total Assets	-0.001[b]	-0.001[c]	-0.001[c]	-0.001	-0.004[a]	-0.003[a]	-0.002[b]	-0.002[b]	-0.006[a]	-0.005[a]	-0.003[b]	-0.002
	[0.0006]	[0.0007]	[0.0005]	[0.0005]	[0.0012]	[0.0012]	[0.0009]	[0.0010]	[0.0016]	[0.0017]	[0.0013]	[0.0013]
	(-2.23)	(-1.76)	(-1.84)	(-1.29)	(-3.09)	(-2.71)	(-2.23)	(-2.03)	(-3.48)	(-2.95)	(-2.00)	(-1.40)
Price-to-Book	-0.054[a]	-0.058[a]	-0.012	-0.019[c]	-0.052[a]	-0.060[a]	-0.016	-0.032[c]	0.004	-0.005	-0.038[c]	-0.068[a]
	[0.0096]	[0.0098]	[0.0096]	[0.0103]	[0.0192]	[0.0196]	[0.0177]	[0.0189]	[0.0220]	[0.0235]	[0.0212]	[0.0232]
	(-5.61)	(-5.97)	(-1.26)	(-1.83)	(-2.73)	(-3.07)	(-0.89)	(-1.68)	(0.17)	(-0.22)	(-1.77)	(-2.95)
Relative Deal Size	0.011	-0.006	0.023	0.011	0.029	0.004	0.043	0.017	0.063	0.004	0.082	0.024
	[0.0311]	[0.0308]	[0.0246]	[0.0242]	[0.0607]	[0.0596]	[0.0485]	[0.0469]	[0.0815]	[0.0788]	[0.0660]	[0.0625]
	(0.37)	(-0.21)	(0.94)	(0.43)	(0.47)	(0.06)	(0.89)	(0.36)	(0.77)	(0.05)	(1.24)	(0.38)

Stock-only financed deals	-0.032[a] [0.0116] (-2.73)	-0.031[a] [0.0119] (-2.61)	-0.022[b] [0.0106] (-2.03)	-0.021[c] [0.0109] (-1.94)	-0.040[c] [0.0208] (-1.90)	-0.035[c] [0.0209] (-1.67)	-0.057[a] [0.0183] (-3.11)	-0.050[a] [0.0181] (-2.78)	0.007 [0.0281] (0.24)	0.017 [0.0282] (0.59)	-0.065[b] [0.0251] (-2.59)	-0.047[c] [0.0245] (-1.91)
Intrastate deals	0.013 [0.0123] (1.08)	0.017 [0.0130] (1.30)	0.014 [0.0098] (1.46)	0.017 [0.0105] (1.60)	0.009 [0.0223] (0.42)	0.015 [0.0222] (0.67)	0.014 [0.0171] (0.80)	0.018 [0.0171] (1.06)	-0.002 [0.0302] (-0.06)	0.002 [0.0300] (0.08)	0.010 [0.0230] (0.45)	0.009 [0.0227] (0.39)
Industry focused deals	0.014 [0.0167] (0.84)	0.019 [0.0168] (1.11)	0.024[c] [0.0132] (1.85)	0.029[b] [0.0133] (2.18)	-0.025 [0.0278] (-0.90)	-0.018 [0.0278] (-0.64)	-0.004 [0.0211] (-0.19)	0.001 [0.0212] (0.04)	-0.059 [0.0374] (-1.57)	-0.044 [0.0371] (-1.19)	-0.022 [0.0299] (-0.73)	-0.013 [0.0285] (-0.45)
Public Targets	0.031[b] [0.0120] (2.58)	0.032[b] [0.0126] (2.58)	0.012 [0.0097] (1.28)	0.012 [0.0102] (1.18)	0.051[b] [0.0213] (2.41)	0.049[b] [0.0218] (2.26)	0.022 [0.0163] (1.38)	0.020 [0.0172] (1.15)	0.044 [0.0291] (1.50)	0.045 [0.0288] (1.56)	0.019 [0.0220] (0.86)	0.025 [0.0223] (1.13)
Constant	0.262[b] [0.1162] (2.25)	0.324[b] [0.1279] (2.53)	-0.169[c] [0.1008] (-1.67)	-0.155 [0.1098] (-1.41)	0.465[b] [0.2272] (2.05)	0.630[a] [0.2422] (2.60)	-0.017 [0.1850] (-0.09)	0.096 [0.1996] (0.48)	0.949[a] [0.3160] (3.00)	1.340[a] [0.3259] (4.11)	-0.045 [0.2505] (-0.18)	0.151 [0.2665] (0.57)
State Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Year Fixed Effects	No	No	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes
N	2642	2642	2642	2642	2181	2181	2181	2181	2181	2181	2181	2181
R^2	0.0404	0.0639	0.3897	0.4023	0.0328	0.0734	0.4400	0.4643	0.0385	0.0918	0.4506	0.4873
Mean VIF	1.29	1.62	2.39	2.09	1.31	1.57	2.25	1.98	1.31	1.57	2.25	1.98

Note: This table presents the results derived from a cross-sectional OLS regression using the Buy-and-Hold Abnormal Returns (BHARs) as dependent variable. BHARs are estimated using the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark. The independent variables are described in the Table 3. BHARs are estimated across three different holding periods that vary from one year to three years (i.e. 12-month, 24-month, and 36-month period) beginning after the bank M&A completion date (effective date). Specifically, Panel A reports the determinants of BHARs for the one-year holding period, Panel B reports the determinants of BHARs for the two-year holding period, and Panel C reports the determinants of BHARs for the three-year holding period. To enhance the validity of the results, alternative regression models are applied without fixed effects (columns 1,5 and 9), with only state-fixed effects (columns 2, 6, and 10), with only year-fixed effects (columns 3, 7, and 11) as well as with both state- and year-fixed effects (columns 4, 8, and 12). The coefficients derived from the regression analysis are reported in the first row of each independent variable. Standard errors are clustered using the two-way clustered method both at bank and at year level and are presented in brackets, whereas, *t*-values are estimated using the double-clustering method and are reported in parentheses. All variables are winsorized at the 1% and the 99% levels. The superscripts a, b and c denote significance at 1%, 5%, and 10% levels, respectively.

The bank asset structure is negatively associated with the long-run performance of M&As, whereas the results indicated its insignificant impact on the short-run performance. With respect to the effect of Price-to-Book on the acquirer's long-run performance, the results show that higher price-to-book ratio is associated with lower levels of long-run performance. The negative impact of acquirer's valuation on the long-run performance was also found by Ferris and Sainani (2021) and Perafán-Peña et al. (2022) whereas the growth opportunities, measured by Tobins' Q, had also negative impact on acquirer's BHARs (Guo et al., 2019).

The relative deal size has an insignificant impact on the acquirer's long-run performance. This results is consistent with the findings of (Doukas and Zhang, 2021; Hsu et al., 2021; Nguyen et al., 2020; Nguyen and Phan, 2017). The selection of stock-financed deals is negatively associated with the acquirer's long-run performance. This pattern of relationship is mainly present over the one-year and the two-year holding period (columns 1 to 8). Therefore, acquirers that select stock-financed deals presented significantly lower long-run performance. This result contradict the findings of Ferris and Sainani (2021), Guo et al. (2019), Nguyen and Phan (2017) and Wan et al. (2021) who suggested insignificant impact of stock-financed deals on the acquirer's long-run performance.

Intrastate deals are insignificantly associated with the acquirer's long-run performance; whereas industry focused deals are also insignificantly associated with the acquirer's BHARs across ten out of twelve models. The insignificant impact of horizontal (focused) deals on the acquirer's long-run performance was also supported by Ferris and Sainani (2021). Insignificant impact of industry-related dummy, measured by the dummy of diversified deals, was also found by Guo et al. (2019) and Nguyen et al. (2020). The acquisition of public targets has significantly negative impact on the acquirer's CAR; however, in the long-run, the results show that the acquisition of public targets has an insignificant impact on the three-year BHARs but a partial significant positive impact on both the one-year and the two-year BHARs. This result may be explained by the fact that acquisitions of public targets significantly destroy shareholder wealth surrounding the deal announcement; though, afterward, the market incorporates additional information and corrects this initial negative reaction within the first two years after the deal completion. Although there were previous studies which supported the negative impact of the acquisition of public targets on acquirer's CARs, they found insignificant effect for the selection of public targets on the long-run acquirer's performance (Ferris and Sainani, 2021; Nguyen and Phan, 2017; Wang et al., 2021).

Chapter 6: The effect of Economic Policy Uncertainty on bank M&A outcomes

This chapter presents the analysis for the impact of Economic Policy Uncertainty (EPU) on bank M&A outcomes. In particular, to capture the effect of policy-related economic uncertainty on the outcomes of bank M&As, several cross-sectional analyses are applied. This chapter analyzes a variety of M&A characteristics such as the short-run performance, measured by the acquirer's Cumulative Abnormal Returns, the takeover premiums, the selection of stock-financed acquisitions, and the time to completion of the announced M&As. Except from the overall Baker-Bloom-Davis (BBD) index for economic policy uncertainty, the effect of several other categorical indices is also examined.

6.1. Acquirer's gains upon bank M&As using the market-adjusted model

Considering the level of policy uncertainty in the year prior to the deal announcement, the sample is separated into two groups. Bank M&As during periods of low (high) uncertainty are characterized the deals that are announced during periods that the level of overall BBD policy uncertainty is lower (higher) than the sample median BBD index over the entire period.

Table 32 presents the results derived from the univariate analysis between deal announcements during periods of low uncertainty (N=1,743) and deal announcements during periods of high uncertainty (N=1,364). CARs are estimated across alternative event-windows using the market-adjusted model with the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark.

According to the results in table 32, bank M&As during periods of low uncertainty are associated with negative and significant CARs. Specifically, in the five-day window, CAR equals to -0.47% whereas in the three-day window CAR equals to -0.52%, suggesting losses in shareholder wealth. On the other hand, during periods of high uncertainty in the majority of the event-windows there are insignificant CARs.

The evaluation of differences in CARs between the two sub-samples suggests that bank M&As during periods of high uncertainty present statistically significant higher CARs by about 0.46% (in the three-day window) compared to M&As during periods of low uncertainty. Moreover, for eight out of ten event windows bank M&As that are announced during periods of high policy uncertainty are associated with significantly higher CARs than those of bank M&As during periods of low policy uncertainty.

Table 32 Acquirer's Cumulative Abnormal Returns (CARs) upon bank M&A announcements using the market-adjusted model with respect to the level of policy-related economic uncertainty

	Panel A: Low Uncertainty (N=1,743) (1)						Panel B: High Uncertainty (N=1,364) (2)						Panel C: Test for differences (2)-(1)			
Event Window	Mean	Median	Std. Dev	%Pos	BMP	Corrado	Mean	Median	Std. Dev	%Pos	BMP	Corrado	Mean	Median	*t*-test	MWU
Pre-announcement event windows																
[-5,-1]	-0.04	-0.20	3.74	46.6	-0.682	-0.540	0.01	-0.11	3.86	48.3	-0.307	-1.397	0.06	0.09	0.404	-1.199
[-2,0]	-0.42[a]	-0.50[a]	4.64	42.1	-5.145	-3.980	0.00	-0.13	3.84	48.3	-0.919	-1.320	0.43[a]	0.37[a]	2.738	-3.689
Announcement event windows																
[-20,20]	-0.43	-0.95	9.84	45.4	-1.215	-0.643	-0.09	-0.46[a]	9.55	48.1	-1.430	-3.692	0.34	0.49	0.973	-0.918
[-5,5]	-0.52[a]	-0.58[b]	6.15	44.4	-4.088	-2.183	0.17	-0.03	6.20	49.9	-0.099	-0.977	0.69[a]	0.56[a]	3.097	-3.154
[-3,3]	-0.55[a]	-0.55[a]	5.66	43.2	-5.272	-2.940	0.16	0.02	5.48	50.3	-0.083	-0.438	0.71[a]	0.57[a]	3.512	-3.911
[-2,2]	-0.47[a]	-0.57[a]	5.37	43.0	-5.369	-3.452	0.14	-0.02	5.04	49.6	0.050	-0.153	0.61[a]	0.55[a]	3.243	-3.706
[-1,1]	-0.52[a]	-0.46[a]	5.02	43.1	-6.080	-4.793	-0.06	-0.13	4.18	48.2	-0.972	-1.267	0.46[a]	0.33[a]	2.734	-3.008
Post-announcement event windows																
[0,1]	-0.53[a]	-0.44[a]	4.31	43.2	-7.291	-6.298	-0.09	-0.20[c]	4.03	46.7	-1.564	-1.940	0.45[a]	0.24[a]	2.948	-2.583
[0,2]	-0.45[a]	-0.39[a]	4.63	43.9	-6.568	-4.182	0.05	-0.11	4.67	48.1	-0.604	-0.291	0.51[a]	0.27[a]	3.007	-2.800
[1,5]	-0.07	-0.27	4.06	46.5	-1.536	-0.037	0.25	0.16	4.63	52.1	1.641	0.987	0.32[b]	0.43[b]	1.995	-2.368

Note: This table presents the acquirer's Cumulative Abnormal Returns (CARs) that are estimated using the market-adjusted model with the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark. CARs are estimated for the entire period 1986-2020 across alternative event windows. In particular, two pre-announcement windows (i.e. (-5,-1), and (-2,0), five announcement event windows (i.e. (-20, 20), (-5, 5), (-3, 3), (-2, 2), and (-1, 1)) and three post-announcement event windows (i.e. (0, 1), (0, 2), and (1, 5)) are presented. Economic Policy Uncertainty (EPU) is measured by the natural logarithm of the three-month weighted mean BBD overall index for the year preceding the bank M&A announcements. Low uncertainty exists when EPU is below the median BBD index over the entire sample period while high EPU exists when EPU equals or is above the mean BBD index. Panel A presents the mean, the median, the standard deviation and the percentage of positive CARs for the sub-sample of bank M&As that are announced during periods of low-uncertainty (N=1,743) whereas Panel B reports the corresponding statistics for the sub-sample of bank M&As that are announced during periods of high uncertainty (N=1,364). The statistical significance of the CARs is assessed using the parametric BMP-test and the non-parametric Corrado-test. Panel C reposts the both the mean and the median differences in CARs between the focused and the diversified bank M&As. The statistical significance for the mean and median differences is assessed using the *t*-test and the Mann-Whitney-U (MWU) test, respectively. The superscripts a, b and c denote significance at 1%, 5% and 10% levels, respectively.

Figure 12 plots the CAARs over the 41-day period between the two sub-samples.

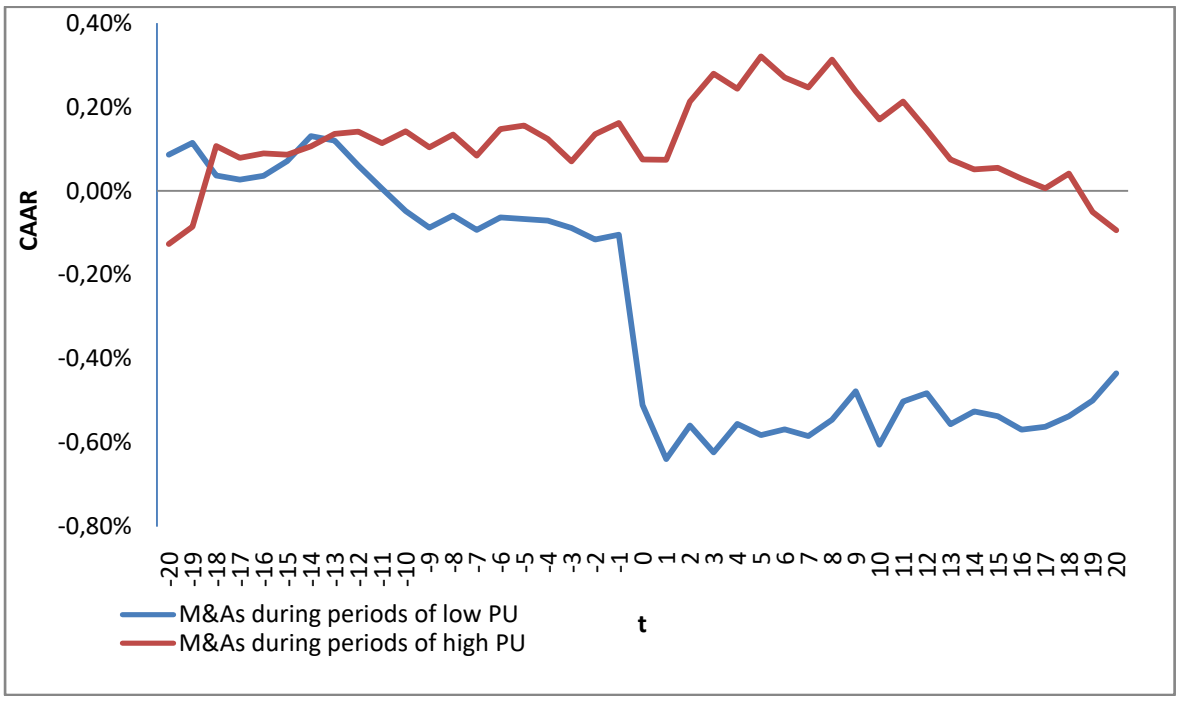

Figure 12. Daily Cumulative Average Abnormal Returns (CAAR) that are estimated using the market-adjusted model for bank M&A announcements between low-uncertainty and high-uncertainty periods

Note: This figure presents the acquirer Cumulative Average Abnormal Returns (CAAR) for the 41-day event window surrounding the announcement date (day 0) during the entire period 1986-2020. CAARs are estimated with the market-adjusted model using the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark. The sample of bank M&As is separated into bank M&As that are announced during periods of high-uncertainty (N=1,364) and those that are announced during periods of low-uncertainty (N=1,743).

As presented in Figure 12, there are two different patterns of market reaction between M&As that are announced during periods of high uncertainty and those that are announced during periods of low uncertainty. On the one hand, for the sub-sample of M&As during periods of low uncertainty, on the announcement date (day 0), there is a remarkable drop in the blue line, suggesting shareholder losses for bank acquirers during periods of low-uncertainty. On the other hand, on the announcement date, there is a rise in the shareholder wealth for bank acquirers during periods of high uncertainty. For the 41-day event window, there are negative CAARs for the two sub-samples; however, bank M&As during periods of low uncertainty present lower acquirer's CAARs compared to bank M&As during periods of high uncertainty.

Even though previous studies provided mixed results for the association between policy uncertainty and acquirer's value, the positive effect of policy uncertainty on the acquirer's CARs was also demonstrated by Nguyen and Phan (2017) who analyzed a sample of corporate M&As (they excluded M&As from both the financial and the utility sectors) in the U.S.A.. They argued that acquirers' outperformance during periods of high uncertainty might be explained both by their more prudent behavior over periods of economic uncertainty and by the transfer of wealth from the

financially constrained target firms to the bidding firms. Similarly, Sha et al. (2020) using a sample of M&As in China provided evidence for positive impact of policy uncertainty on the announcement returns which was also explained by the fact that during periods of high policy uncertainty companies tend to be more prudent or to delay investments with high levels of risk. In line with the above findings, this thesis demonstrates that amid periods of high policy-related economic uncertainty in the U.S.A., acquirer's announcement CARs upon bank M&As are significantly higher compared to those during periods of low economic policy uncertainty. Therefore, policy uncertainty make U.S. banks be more cautious in decision making for investments in the field of M&As. During periods of policy uncertainty, it is also possible for banks to apply more comprehensive processes for the selection of target firms or to appropriate use the due-diligence period (e.g time from the non-disclosure agreement to the official deal announcement) so as to achieve better acquisition gains.

6.2. Acquirer's gains upon bank M&As using the market model

Table 33 presents the results of CARs estimated using the market model both for M&As during low uncertainty period (Panel A) and for M&As during high uncertainty periods (Panel B), as well as, the differences in CARs between the two sub-samples (Panel C).

According to the results, bank M&As during low uncertainty periods are associated with significant and negative CARs across seven out of ten event windows. Bank M&As during periods of high uncertainty are also associated with negative and significant mean CARs across six out of ten event windows. In particular, for bank M&As that are announced during periods of low uncertainty, CARs, on average, equal to -0.51% in the three day event window (-1, 1) and are significant at the 1% level, whereas for bank M&As that are announced during periods of high uncertainty, the mean CARs equal to -0.16% and are significant at the 10% level.

With respect to the differences between the two sub-samples, the results indicate that acquirer's three-day CARs are significantly higher for bids during high-uncertainty periods by about 0.35% compared to bids during low-uncertainty periods. In the five-day window the results also confirm that bank M&As during periods of high uncertainty create significantly higher gains by about 0.44% compared to M&As during periods of low uncertainty. Therefore, the market reaction to bank M&As during high-uncertainty periods is significantly different than its reaction to bank M&As during low-uncertainty periods. Amid policy uncertainty banks become more prudent with their investments and engage in well-designed, necessary, or market-induced M&A deals which can explain this pattern of market reaction.

Table 33. Acquirer's Cumulative Abnormal Returns (CARs) upon bank M&A announcements using the market model with respect to the level of policy-related economic uncertainty

	Panel A: Low Uncertainty (N=1,743) (1)						Panel B: High Uncertainty (N=1,364) (2)						Panel C: Test for differences (2)-(1)			
Event Window	Mean	Median	Std. Dev	%Pos	BMP	Corrado	Mean	Median	Std. Dev	%Pos	BMP	Corrado	Mean	Median	*t*-test	MWU
Pre-announcement event windows																
[-5,-1]	-0.05	-0.16	3.72	47.0	-0.841	-1.300	-0.16[c]	-0.22[c]	3.60	46.3	-1.718	-1.652	-0.11	-0.05	-0.822	-0.278
[-2,0]	-0.40[a]	-0.39[a]	4.57	40.9	-4.934	-4.213	-0.11[b]	-0.18	3.80	46.0	-2.055	-1.491	0.29[c]	0.21[a]	1.857	-2.618
Announcement event windows																
[-20,20]	-0.35	-0.70	10.35	47.2	-0.493	-1.412	-1.31[a]	-1.26[a]	9.74	44.4	-4.432	-3.616	-0.96[a]	-0.57[a]	-2.636	-2.719
[-5,5]	-0.47[a]	-0.44[a]	6.36	45.0	-3.814	-2.750	-0.17[c]	-0.27	5.92	47.4	-1.716	-0.772	0.29	0.17	1.320	-1.611
[-3,3]	-0.53[a]	-0.56[a]	5.67	43.8	-5.030	-3.541	-0.08	-0.20	5.28	47.3	-1.583	-0.369	0.44[b]	0.36[a]	2.235	-2.594
[-2,2]	-0.45[a]	-0.50[a]	5.33	43.0	-5.117	-3.809	-0.02	-0.22	5.00	47.4	-1.163	-0.063	0.44[b]	0.28[b]	2.328	-2.478
[-1,1]	-0.51[a]	-0.45[a]	4.96	42.6	-6.041	-5.008	-0.16[c]	-0.21	4.12	46.5	-1.835	-1.394	0.35[b]	0.24[b]	2.078	-2.291
Post-announcement event windows																
[0,1]	-0.51[a]	-0.34[a]	4.26	42.5	-7.083	-6.330	-0.15[b]	-0.26[b]	4.00	44.1	-2.081	-2.038	0.36[b]	0.08[c]	2.380	-1.905
[0,2]	-0.44[a]	-0.38[a]	4.56	43.0	-6.360	-4.429	-0.02	-0.19	4.64	46.8	-1.100	-0.042	0.42[b]	0.20[b]	2.535	-2.155
[1,5]	-0.03	-0.22	4.07	47.0	-1.173	-0.219	0.10	-0.03	4.43	49.6	0.821	1.404	0.13	0.19	0.874	-1.203

Note: This table presents the acquirer's Cumulative Abnormal Returns (CARs) that are estimated using the market model with the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark. CARs are estimated for the entire period 1986-2020 across alternative event windows. In particular, two pre-announcement windows (i.e. (-5,-1), and (-2,0), five announcement event windows (i.e. (-20, 20), (-5, 5), (-3, 3), (-2, 2), and (-1, 1)) and three post-announcement event windows (i.e. (0, 1), (0, 2), and (1, 5)) are presented. Economic Policy Uncertainty (EPU) is measured with natural logarithm of the three-month average weighted mean BBD overall index for year preceding the deal announcements. Low uncertainty exists when EPU is below the median BBD index over the entire sample period while high EPU exists when EPU equals or is above the mean BBD index. Panel A presents the mean, the median, the standard deviation and the percentage of positive CARs for the sub-sample of bank M&As that are announced during periods of low-uncertainty (N=1,743) whereas Panel B reports the corresponding statistics for the sub-sample of bank M&As that are announced during periods of high uncertainty (N=1,364). The statistical significance of the CARs is assessed using the parametric BMP-test and the non-parametric Corrado-test. Panel C reposts the both the mean and the median differences in CARs between the focused and the diversified bank M&As. The statistical significance for the mean and median differences is assessed using the *t*-test and the Mann-Whitney-U (MWU) test, respectively. The superscripts a, b and c denote significance at 1%, 5% and 10% levels, respectively.

6.3. Acquirer's gains upon bank M&As using the four-factor model

With respect to the periods of policy uncertainty, table 34 reports the results of CARS using the four-factor model. The results show that bank M&As constitute events that destroy acquirer's value over periods of low uncertainty. In particular, there are negative and significant CARs across all the employed event-windows. The five-day (-2,2) CARs equal to -0.51% while the three-days CARs (-1,1) equal to -0.57%. Statistically significant and negative mean CARs are also presented during periods of high uncertainty for six out of ten event windows. Specifically, bank M&As during periods of high uncertainty are associated with statistically significantly negative acquirer's CARs that equal to -0.17% in the three-day (-1,+1) event window. The results in Panel C of the table 34 show that bank M&A announcements during periods of high uncertainty are associated with significantly higher CARs (by about 0.39%) compared to M&A announcements during periods of low uncertainty.

Table 34. Acquirer's Cumulative Abnormal Returns (CARs) upon bank M&A announcements using the four-factor model with respect to the level of policy-related economic uncertainty

	Panel A: Low Uncertainty (N=1,743) (1)						Panel B: High Uncertainty (N=1,364) (2)						Panel C: Test for differences (2)-(1)			
Event Window	Mean	Median	Std. Dev	%Pos	BMP	Corrado	Mean	Median	Std. Dev	%Pos	BMP	Corrado	Mean	Median	*t*-test	MWU
Pre-announcement event windows																
[-5,-1]	-0.11[c]	-0.27	3.60	45.4	-1.734	-1.113	-0.14[c]	-0.26	3.62	45.3	-1.838	-1.056	-0.03	0.13	-0.202	-0.063
[-2,0]	-0.43[a]	-0.46[a]	4.56	41.5	-5.573	-4.207	-0.11[b]	-0.22	3.81	46.0	-2.210	-1.260	0.32[b]	0.34[b]	2.084	-2.552
Announcement event windows																
[-20,20]	-0.81[c]	-0.98	10.02	44.8	-1.907	-0.968	-1.31[a]	-1.46[c]	9.56	42.7	-5.036	-1.821	-0.50	-0.33	-1.413	-1.493
[-5,5]	-0.65[a]	-0.64[a]	6.25	42.5	-5.203	-2.934	-0.16[c]	-0.41	5.93	46.7	-1.903	0.125	0.49[b]	0.47[b]	2.195	-2.303
[-3,3]	-0.62[a]	-0.63[a]	5.58	41.9	-5.903	-3.572	-0.08	-0.29	5.32	46.8	-1.342	0.708	0.54[a]	0.55[a]	2.749	-3.118
[-2,2]	-0.51[a]	-0.55[a]	5.31	42.8	-5.800	-3.834	-0.05	-0.21	5.06	48.1	-1.482	0.249	0.46[b]	0.50[a]	2.461	-2.600
[-1,1]	-0.57[a]	-0.52[a]	4.92	41.0	-6.873	-5.316	-0.17[b]	-0.28	4.13	45.5	-2.105	-1.112	0.39[b]	0.35[b]	2.370	-2.531
Post-announcement event windows																
[0,1]	-0.57[a]	-0.38[a]	4.22	41.5	-7.894	-6.730	-0.17[b]	-0.32[c]	3.98	44.3	-2.340	-1.807	0.40[a]	0.22[b]	2.679	-2.113
[0,2]	-0.50[a]	-0.46[a]	4.51	41.9	-7.112	-4.739	-0.06	-0.23	4.65	46.5	-1.448	0.202	0.44[a]	0.40[b]	2.682	-2.404
[1,5]	-0.12[c]	-0.34	3.98	45.7	-1.757	-0.514	0.09	-0.01[b]	4.44	49.8	0.664	2.268	0.21	0.43[c]	1.391	-1.737

Note: This table presents the acquirer's Cumulative Abnormal Returns (CARs) that are estimated using the Carhart Four-factor model with the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark. CARs are estimated for the entire period 1986-2020 across alternative event windows. In particular, two pre-announcement windows (i.e. (-5,-1), and (-2,0), five announcement event windows (i.e. (-20, 20), (-5, 5), (-3, 3), (-2, 2), and (-1, 1)) and three post-announcement event windows (i.e. (0, 1), (0, 2), and (1, 5)) are presented. Economic Policy Uncertainty (EPU) is measured by the natural logarithm of the three-month weighted mean BBD overall index for the year preceding the bank M&A announcements. Low uncertainty exists when EPU is below the median BBD index over the entire sample period while high EPU exists when EPU equals or is above the mean BBD index. Panel A presents the mean, the median, the standard deviation and the percentage of positive CARs for the sub-sample of bank M&As that are announced during periods of low-uncertainty (N=1,743) whereas Panel B reports the corresponding statistics for the sub-sample of bank M&As that are announced during periods of high uncertainty (N=1,364). The statistical significance of the CARs is assessed using the parametric BMP-test and the non-parametric Corrado-test. Panel C reposts the both the mean and the median differences in CARs between the focused and the diversified bank M&As. The statistical significance for the mean and median differences is assessed using the *t*-test and the Mann-Whitney-U (MWU) test, respectively. The superscripts a, b and c denote significance at 1%, 5% and 10% levels, respectively.

6.4. Cross-sectional analysis for the impact of EPU on acquirer's CARs

To estimate the effects of economic policy uncertainty (EPU) on the acquirer's CARs several cross-sectional regressions are employed to estimate the model in Eq. 20[23] . In particular, six different measurements of EPU are used to enhance the robustness of the results. EPU is measured using the arithmetic mean of BBD index over the 12-, 6-, and 3-month period at the year-end preceding the deal announcement (these results are presented in columns 1 to 6). Moreover, EPU is measured using the weighted arithmetic mean over the 12-, 6-, and 3-month period at the year-end preceding the announcement (these results are presented in columns 7 to 12). For example, the three-month weighted mean EPU is measured using the weights of 1/6, 1/3, and 1/2 for the overall BBD index for the October, the November and the December at year-end preceding to the announcement, respectively.

Moreover, for each measurement of EPU we employ two different regression models: the first one utilizes the total number of the observations (N=3,107) and therefore it includes control variables with full observations whereas the second one utilizes the total set of the control variables (taking into account both bank-specific and deal-specific factors) and therefore the total number of observations is slightly reduced (N=2,759) due to the existence of non-available data. State fixed effects are included to all the applied models to control for potential differences in CARs across acquirers' States.

Table 35 reports the regression results for the impact of Economic Policy Uncertainty (EPU) on the acquirer's CARs using alternative measurements of EPU. According to the results, Economic Policy Uncertainty (EPU) has a significant and positive impact on acquirer's CARs across the models, a result that holds irrespectively of both the measurement of EPU and the usage of a full-set of control variables.

Across the models 1 to 6 (EPU is measured with the arithmetic mean) the coefficient of EPU is positive and significant and varies from 0.009 to 0.011. Across the models 7 to 12 (EPU is measured with the weighted mean) the coefficient of EPU is also positive and significant (at the 1% level) and is equal to 0.010. The above results suggest that acquirer's shareholder wealth is positively affected by the level of economic policy uncertainty and therefore in periods of high policy uncertainty acquirers are associated with higher CARs.

[23] Section 3.6.1. describes the procedure for the cross-sectional analyses.

Table 35. The effect of Economic Policy Uncertainty (EPU) on acquirer's announcement CARs: A cross sectional analysis

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
EPU $_{12\text{-month arithmetic mean}}$	0.009[a]	0.009[b]										
	[0.0034]	[0.0038]										
	(2.75)	(2.46)										
EPU $_{6\text{-month arithmetic mean}}$			0.009[a]	0.009[a]								
			[0.0031]	[0.0035]								
			(2.82)	(-2.61)								
EPU $_{3\text{-month arithmetic mean}}$					0.010[a]	0.011[a]						
					[0.0029]	[0.0032]						
					(3.49)	(3.46)						
EPU $_{12\text{-month weighted arithmetic mean}}$							0.010[a]	0.010[a]				
							[0.0033]	[0.0037]				
							(2.97)	(2.73)				
EPU $_{6\text{-month weighted arithmetic mean}}$									0.010[a]	0.010[a]		
									[0.0030]	[0.0034]		
									(3.17)	(3.02)		
EPU $_{3\text{-month weighted arithmetic mean}}$											0.010[a]	0.010[a]
											[0.0028]	[0.0032]
											(3.40)	(3.29)
Total Assets		-0.001		-0.001		-0.001		-0.001		-0.001		-0.001
		[0.0008]		[0.0008]		[0.0008]		[0.0008]		[0.0008]		[0.0008]
		(-1.22)		(-1.19)		(-1.22)		(-1.23)		(-1.21)		(-1.22)
AGE	-0.003[a]	-0.003[b]	-0.003[a]	-0.003[b]	-0.003[a]	-0.003[b]	-0.003[a]	-0.003[b]	-0.003[a]	-0.003[b]	-0.003[a]	-0.003[b]
	[0.0008]	[0.0011]	[0.0008]	[0.0011]	[0.0008]	[0.0011]	[0.0008]	[0.0011]	[0.0008]	[0.0011]	[0.0008]	[0.0011]
	(-3.36)	(-2.40)	(-3.35)	(-2.41)	(-3.36)	(-2.49)	(-3.38)	(-2.44)	(-3.37)	(-2.45)	(-3.35)	(-2.45)
Return on Assets		0.004		0.004		0.004[c]		0.004		0.004		0.004
		[0.0027]		[0.0027]		[0.0027]		[0.0027]		[0.0027]		[0.0027]
		(1.54)		(1.55)		(1.69)		(1.57)		(1.61)		(1.62)
Reserve for Loan Losses % Total Loans		0.002		0.002		0.002[c]		0.002		0.002		0.002[c]
		[0.0011]		[0.0011]		[0.0011]		[0.0011]		[0.0011]		[0.0011]
		(1.52)		(1.54)		(1.65)		(1.54)		(1.59)		(1.68)
Total Debt % Common Equity		0.000		0.000		0.000		0.000		0.000		0.000
		[0.0000]		[0.0000]		[0.0000]		[0.0000]		[0.0000]		[0.0000]
		(0.75)		(0.76)		(0.84)		(0.78)		(0.80)		(0.78)

Total Loans % Total Assets		0.000 [0.0001] (1.38)		0.000 [0.0001] (1.36)		0.000 [0.0001] (1.33)		0.000 [0.0001] (1.37)		0.000 [0.0001] (1.35)		0.000 [0.0001] (1.31)
Price-to-Book		-0.002[c] [0.0014] (-1.71)		-0.002[c] [0.0014] (-1.72)		-0.002[c] [0.0014] (-1.66)		-0.002[c] [0.0014] (-1.65)		-0.002[c] [0.0014] (-1.66)		-0.002 [0.0014] (-1.63)
Relative Deal Size	-0.005 [0.0040] (-1.37)	-0.010[b] [0.0052] (-1.97)	-0.006 [0.0040] (-1.38)	-0.010[b] [0.0051] (-1.98)	-0.006 [0.0040] (-1.40)	-0.010[b] [0.0051] (-1.98)	-0.006 [0.0040] (-1.38)	-0.010[b] [0.0051] (-1.98)	-0.006 [0.0040] (-1.39)	-0.010[b] [0.0051] (-1.98)	-0.006 [0.0040] (-1.42)	-0.010[b] [0.0051] (-2.00)
Stock-only financed deals	-0.003[c] [0.0015] (-1.96)	-0.003 [0.0016] (-1.64)	-0.003[c] [0.0015] (-1.96)	-0.003 [0.0016] (-1.64)	-0.003[c] [0.0015] (-1.94)	-0.003 [0.0016] (-1.63)	-0.003[c] [0.0015] (-1.94)	-0.003 [0.0016] (-1.63)	-0.003[c] [0.0015] (-1.93)	-0.003 [0.0016] (-1.62)	-0.003[b] [0.0015] (-1.99)	-0.003[c] [0.0016] (-1.69)
Intrastate deals	0.002 [0.0015] (1.06)	0.000 [0.0016] (0.21)	0.002 [0.0015] (1.04)	0.000 [0.0016] (0.22)	0.001 [0.0014] (1.03)	0.000 [0.0016] (0.21)	0.002 [0.0015] (1.05)	0.000 [0.0016] (0.21)	0.001 [0.0015] (1.03)	0.000 [0.0016] (0.21)	0.002 [0.0014] (1.04)	0.000 [0.0016] (0.21)
Industry focused deals	0.001 [0.0019] (0.45)	0.002 [0.0020] (0.85)	0.001 [0.0019] (0.50)	0.002 [0.0020] (0.88)	0.001 [0.0019] (0.47)	0.002 [0.0020] (0.83)	0.001 [0.0019] (0.45)	0.002 [0.0020] (0.85)	0.001 [0.0019] (0.48)	0.002 [0.0020] (0.86)	0.001 [0.0019] (0.47)	0.002 [0.0020] (0.84)
Public Targets	-0.011[a] [0.0015] (-7.83)	-0.010[a] [0.0016] (-6.26)	-0.011[a] [0.0015] (-7.86)	-0.010[a] [0.0016] (-6.28)	-0.011[a] [0.0015] (-7.85)	-0.010[a] [0.0016] (-6.27)	-0.011[a] [0.0015] (-7.83)	-0.010[a] [0.0016] (-6.26)	-0.011[a] [0.0015] (-7.86)	-0.010[a] [0.0016] (-6.28)	-0.011[a] [0.0015] (-7.84)	-0.010[a] [0.0016] (-6.26)
Constant	-0.015 [0.0166] (-0.92)	-0.006 [0.0241] (-0.23)	-0.013 [0.0157] (-0.83)	-0.004 [0.0235] (-0.19)	-0.019 [0.0150] (-1.26)	-0.013 [0.0228] (-0.57)	-0.017 [0.0163] (-1.05)	-0.009 [0.0240] (-0.36)	-0.017 [0.0155] (-1.09)	-0.009 [0.0233] (-0.40)	-0.017 [0.0149] (-1.17)	-0.010 [0.0226] (-0.45)
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3107	2759	3107	2759	3107	2759	3107	2759	3107	2759	3107	2759
R^2	0.0701	0.0719	0.0703	0.0722	0.0715	0.0740	0.0705	0.0724	0.0709	0.0730	0.0712	0.0735
Mean VIF	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63

Note: This table reports the results derived from OLS regression models for the impact of Economic Policy Uncertainty (EPU) on the value creation upon bank M&A announcements. The dependent variable is the three-day (-1,1) acquirer Cumulative Abnormal Return (CAR) that are estimated using the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark. EPU is estimated by the natural logarithm of the three-month, the six-month, and the twelve-month mean (both arithmetic mean and weighted mean) BBD overall index for the year preceding the bank M&A announcements. The control variables that are used in the cross-sectional analysis include both bank-specific and deal-specific characteristics and are described in the Table 3. In columns 1, 3, 5, 7, 9, and 11 the regression analysis contains only those control variables that have available data for the whole sample (N=3,107), whereas in the rest of columns the regression analysis contains the full set of the control variables (N=2,759). State-fixed effects are also included in the regression models. The coefficients derived from the regression analysis are reported in the first line of each independent variable. Standard errors are clustered using the two-way clustered method both at bank and at year level and are presented in brackets, whereas, *t*-values estimated using the double-clustering method are reported in parentheses. All variables are winsorized at the 1% and the 99% levels. The superscripts a, b and c denote significance at 1%, 5%, and 10% levels, respectively.

The results confirm that banks' age and price-to-book ratio are negatively associated with the acquirer's CARs, whereas the return on assets (ROA) has a positive and partial significant impact on shareholder wealth (column 6).

To economically interpret the association between economic policy uncertainty (EPU) and acquirer's CARs, according to the results derived from the column 12 (using the three-month weighted average), a one standard deviation increase in EPU index (above its mean level) is associated with an increase by 24.6 bps in CARs, assuming that all other independent variables are fixed at their mean levels. The positive impact of policy uncertainty on acquirer's CARs is also supported by Nguyen and Phan (2017) who found that a one standard deviation increase in EPU is associated with an increase by 70 bps in acquirer's CARs, by Paudyal et al., (2021), as well as by Sha et al. (2020). On the contrary, Adra et al. (2020) and Shams et al. (2022) argued the existence of negative relationship between uncertainty and acquirer's CARs, whereas Bonaime et al. (2018) demonstrated insignificant differences in acquirer's CARs with respect to the level of policy uncertainty.

The above cross-sectional analysis includes state-fixed effects and the R^2 of the regression models ranges from 0.0701 to 0.0740 and is in accordance with the R^2 levels of previous related studies. In the cross-sectional analysis of CARs in the study of Alexandridis et al. (2017), the Adj-R^2 was 5.10% (using industry fixed effects) whereas it was 18% (using both firm and industry fixed effects). However, according to Golubov et al. (2015) the variation in acquirer's CARs that can be explained by the inclusion of firm-fixed effects is analogous with the variation in CARs that can be explained by the inclusion of both deal-specific and firm-specific control characteristics. Although there are studies in the field of corporate M&As which include industry-fixed effects (Alexandridis et al., 2017), this thesis focuses only in the banking sector and therefore the inclusion of industry-fixed effects is not meaningful[24]. After controlling for industry fixed-effects in regression models that analyzed the impact of monetary policy uncertainty on acquirer's five-days CARs, in the study of Adra et al. (2020), the Adj-R^2 varied from 0.04 to 0.06. In the cross-sectional analysis of Cao et al. (2019) for the impact of policy uncertainty on the seven-day acquirer's CARs (-3,3), the R^2 equal to 0.012 using nation-fixed effects, industry-fixed effects, and year-fixed effects. Shams et al. (2022) analyzed the impact of Economic Policy Uncertainty on acquirer's CARs in the Australia and the R-square across the main models varied from 0.0317 to 0.0341, after controlling for several deal-specific and firm-specific characteristic and using both year-fixed effects and industry-fixed effects. Nguyen and Phan (2017) evaluated the impact of BBD policy uncertainty on the acquirer's three-day (-1,1) CAR using regression analysis and the

[24] Despite the fact that the dataset is consisted of both acquirers and targets with SIC codes that equal to 602, 603 or 6712, the dummy variable "industry-focused deals" is also included to capture potential differences in M&A outcomes for bidders and targets with same two-digit SIC code.

Adj-R^2 equal to 0.03, after controlling for several firm-specific and deal-specific characteristics.

To further analyze the determinants of acquirer's gains with respect to the level of policy uncertainty, we construct a dummy variable (Low EPU dummy) that is assigned the value of 1 for bank M&As announced during periods of low policy uncertainty[25] and 0 otherwise. The results for this analysis are presented in table 36. Across the columns 1 and 2 the determinants of acquirer's CARs are assessed for deal announcements during periods of low EPU whereas across the columns 3 and 4, the determinants of acquirer's CARs are assessed for deal announcements during periods of high EPU. To investigate the impact of low uncertainty on acquirer's shareholder wealth over the entire period 1986-2020, across columns 5 and 6 the regression models include the low EPU dummy to analyze whether shareholder wealth changes with respect to the level of uncertainty upon the announcement of bank M&As.

Table 36. Determinants of acquirer's CARs with respect to the level of Economic Policy Uncertainty (EPU): A cross sectional analysis

	Panel A		Panel B		Panel C	
	Period of Low EPU		Period of High EPU		Entire period	
	(1)	(2)	(3)	(4)	(5)	(6)
Low EPU dummy					-0.005[a]	-0.005[a]
					[0.0014]	[0.0015]
					(-3.30)	(-3.18)
Total Assets		-0.001		-0.001		-0.001
		[0.0011]		[0.0013]		[0.0008]
		(-0.82)		(-0.82)		(-1.15)
AGE	-0.003[a]	-0.003[c]	-0.002	-0.002	-0.003[a]	-0.002[b]
	[0.0010]	[0.0014]	[0.0013]	[0.0017]	[0.0008]	[0.0011]
	(-3.02)	(-1.95)	(-1.25)	(-1.46)	(-3.20)	(-2.31)
Return on Assets		0.007[c]		0.001		0.004
		[0.0040]		[0.0038]		[0.0027]
		(1.75)		(0.37)		(1.47)
Reserve for Loan Losses % Total Loans		0.001		0.002		0.002
		[0.0013]		[0.0018]		[0.0011]
		(1.03)		(0.94)		(1.58)
Total Debt % Common Equity		0.000		0.000		0.000
		[0.0000]		[0.0000]		[0.0000]
		(1.17)		(-0.52)		(0.55)
Total Loans % Total Assets		0.000		0.000[c]		0.000
		[0.0001]		[0.0001]		[0.0001]
		(-0.21)		(1.87)		(1.34)
Price-to-Book		-0.003[c]		-0.001		-0.002
		[0.0017]		[0.0026]		[0.0014]
		(-1.83)		(-0.42)		(-1.60)
Relative Deal Size	-0.009[c]	-0.015[b]	-0.001	-0.005	-0.005	-0.010[c]
	[0.0055]	[0.0065]	[0.0061]	[0.0086]	[0.0040]	[0.0052]
	(-1.71)	(-2.37)	(-0.12)	(-0.54)	(-1.35)	(-1.92)
Stock-only financed deals	-0.002	-0.002	-0.003	-0.003	-0.003[b]	-0.003[c]
	[0.0020]	[0.0022]	[0.0021]	[0.0023]	[0.0015]	[0.0016]
	(-1.06)	(-1.04)	(-1.64)	(-1.30)	(-2.08)	(-1.76)

[25] Low policy uncertainty dummy takes the value of 1 for those deals that are announced in periods when the three-month weighted average of the overall BBD index is lower than its median value over the entire sample period (1986-2020).

Intrastate deals	0.002 [0.0020] (0.89)	0.002 [0.0022] (0.71)	0.002 [0.0022] (0.73)	0.000 [0.0024] (-0.17)	0.001 [0.0014] (1.01)	0.000 [0.0016] (0.16)
Industry focused deals	0.003 [0.0024] (1.10)	0.004 [0.0026] (1.45)	-0.002 [0.0030] (-0.82)	-0.002 [0.0032] (-0.55)	0.001 [0.0019] (0.52)	0.002 [0.0020] (0.88)
Public Targets	-0.011[a] [0.0020] (-5.66)	-0.010[a] [0.0021] (-4.67)	-0.011[a] [0.0021] (-5.40)	-0.010[a] [0.0023] (-4.27)	-0.011[a] [0.0015] (-7.79)	-0.010[a] [0.0016] (-6.20)
Constant	0.033[a] [0.0106] (3.16)	0.047[b] [0.0222] (2.12)	0.013 [0.0122] (1.03)	0.027 [0.0280] (0.98)	0.028[a] [0.0080] (3.50)	0.038[b] [0.0172] (2.22)
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
N	1743	1583	1364	1176	3107	2759
R^2	0.0908	0.0932	0.0815	0.0879	0.0709	0.0731
Mean VIF	1.60	1.63	1.77	1.75	1.62	1.62

Note: This table reports the results derived from OLS regression models for the determinants of value creation upon bank M&A announcements. The dependent variable is the three-day (-1,1) acquirer's Cumulative Abnormal Returns (CARs) that are estimated with the market-adjusted model using the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark.. The independent variables that are used in the cross-sectional analysis include bank-specific and deal-specific characteristics and are described in the Table 3. Panel A reports the results of the cross-sectional analysis for bank M&As that are announced during periods of low-uncertainty, whereas Panel B reports the results of the cross-sectional analysis for bank M&As that are announced during periods of high uncertainty. Panel C reports the results of the cross-sectional analysis for the entire period (1986-2020) using the low-uncertainty dummy in order to investigate the impact of low-uncertainty periods on the acquirer's CARs. Low uncertainty exists when EPU is below the median BBD index over the entire sample period while high uncertainty exists when EPU equals or is above the mean BBD index. In columns 1, 3, and 5 the regression analysis contains only those control variables that have available data for the whole sample, whereas in the rest of columns the regression analysis contains the full set of the control variables. State-fixed effects are also included in the regression models. The coefficients derived from the regression analysis are reported in the first line of each independent variable. Standard errors are clustered using the two-way clustered method both at bank and at year level and are presented in brackets, whereas, *t*-values estimated using the double-clustering method are reported in parentheses. All variables are winsorized at the 1% and the 99% levels. The superscripts a, b and c denote significance at 1%, 5%, and 10% levels, respectively.

The results show that banks' AGE has a significant and negative impact on acquirer's CARs only during periods of low policy uncertainty and it has an insignificant impact during periods of high uncertainty. Return on Assets (ROA) is significantly positively associated (at 10% level) with acquirer's value for deal announcements during periods of low uncertainty whereas it has no explanatory power on acquirer's CARs for announcements over periods of high uncertainty. The ratio of total loans to total assets significantly positively affects the acquirer's CARs (at the 10% level) for bank M&As during periods of high uncertainty but it insignificantly associated with acquirer's CARs for M&As during periods of low uncertainty. The price-to-book ratio is negatively associated with acquirer's CARs only for bank M&A announcement during periods of low uncertainty.

With respect to the impact of deal-specific factors on shareholder wealth, relative deal size is significantly negatively associated with acquirer's CARs for bank M&As during periods of low uncertainty whereas it insignificantly associated with three-day CARs over periods of high uncertainty. The acquisition of public targets is significantly negatively associated (at the 1% level) with shareholder value for bank M&As that are announced both during periods of low uncertainty and during periods

of high uncertainty, suggesting that targets listed status has a significant impact on value creation from M&As, irrespectively of the level of policy uncertainty.

Over the entire period (1986-2020), results show that low EPU dummy has a significant (at the 1% level) and negative impact on acquirer's shareholder value. In particular, the coefficient of low uncertainty dummy equals to -0.005 irrespectively of the usage of a set of full control variables. This result suggests that CARs upon bank M&As that are announced during periods of low uncertainty are lower than CARs of bank M&As during periods of high uncertainty. Furthermore, banks' AGE, relative deal size, stock-only financed deals and the acquisition of public targets have a statistically significant and negative impact on acquirer's CARs (column 6) over the entire period.

Policy uncertainty can be measured not only by the overall BBD index but also by alternative categorical indices with respect to the alternative aspects of uncertainty[26]. In table 37, the regression analysis uses alternative proxies of policy uncertainty to investigate the impact of alternative categorical indices on acquirer's CARs. In particular, the main component of the overall BBD index is the news-based policy uncertainty (with a weight of ½) and its impact on shareholder wealth is presented in column 1. Expect from the components of the overall BBD index, there are several other categorical indices that include the economic policy uncertainty (column 2), the monetary policy uncertainty (column 3), the fiscal policy uncertainty (column 4), the uncertainty of taxes (column 5), the government spending uncertainty (column 6), the health care uncertainty (column 7), the national security uncertainty (column 8), the entitlement program uncertainty (column 9), the regulation uncertainty (column 10) and the financial regulation uncertainty (column 11). To fully analyze the impact of monetary uncertainty on the valuation effects of bank M&As, the Baked-Bloom-Davis Monetary Policy Uncertainty index (BBD MPU) index is also used as a proxy of EPU (column 12).

[26] More details about the overall BBD index, its components, and several categorical policy uncertainty indices are available at: https://www.policyuncertainty.com/us_monthly.html (Assessed on 30 March 2022).

Table 37. The effect of categorical indices of Economic Policy Uncertainty on acquirer's announcement CARs: A cross-sectional analysis

	(1) News-based policy uncertainty	(2) Economic policy uncertainty	(3) Monetary policy	(4) Fiscal Policy	(5) Taxes	(6) Government Spending	(7) Health care	(8) National security	(9) Entitlement Programs	(10) Regulation	(11) Financial Regulation	(12) BBD MPU
EPU	0.009[a]	0.008[a]	0.003[b]	0.007[a]	0.007[a]	0.005[a]	0.007[a]	0.004[b]	0.006[a]	0.009[a]	0.003[a]	0.003[a]
	[0.0023]	[0.0021]	[0.0014]	[0.0016]	[0.0016]	[0.0011]	[0.0013]	[0.0014]	[0.0013]	[0.0021]	[0.0009]	[0.0014]
	(3.91)	(3.65)	(2.04)	(4.54)	(4.17)	(4.34)	(4.95)	(2.55)	(4.70)	(4.25)	(3.67)	(2.04)
Total Assets	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	[0.0008]	[0.0008]	[0.0008]	[0.0008]	[0.0008]	[0.0008]	[0.0008]	[0.0008]	[0.0008]	[0.0008]	[0.0008]	[0.0008]
	(-1.16)	(-1.01)	(-0.87)	(-1.17)	(-1.18)	(-1.11)	(-1.13)	(-0.99)	(-0.80)	(-1.24)	(-1.16)	(-0.87)
AGE	-0.003[b]	-0.002[b]	-0.002[b]	-0.003[b]	-0.003[b]	-0.003[b]	-0.003[a]	-0.002[b]	-0.003[b]	-0.003[b]	-0.003[b]	-0.002[b]
	[0.0011]	[0.0011]	[0.0011]	[0.0011]	[0.0011]	[0.0011]	[0.0011]	[0.0011]	[0.0011]	[0.0011]	[0.0011]	[0.0011]
	(-2.46)	(-2.21)	(-2.00)	(-2.48)	(-2.49)	(-2.34)	(-2.81)	(-2.12)	(-2.45)	(-2.52)	(-2.43)	(-2.00)
Return on Assets	0.004	0.004	0.003	0.004	0.004	0.004	0.004	0.003	0.004	0.005[c]	0.005[c]	0.003
	[0.0027]	[0.0027]	[0.0027]	[0.0026]	[0.0026]	[0.0026]	[0.0026]	[0.0027]	[0.0027]	[0.0027]	[0.0027]	[0.0027]
	(1.62)	(1.42)	(1.19)	(1.59)	(1.61)	(1.35)	(1.52)	(1.14)	(1.32)	(1.76)	(1.70)	(1.19)
Reserve for Loan Losses % Total Loans	0.002[c]	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.002	0.002	0.001
	[0.0011]	[0.0011]	[0.0011]	[0.0011]	[0.0011]	[0.0011]	[0.0011]	[0.0011]	[0.0011]	[0.0011]	[0.0011]	[0.0011]
	(1.84)	(1.07)	(1.37)	(1.34)	(1.48)	(1.07)	(1.30)	(1.34)	(1.26)	(1.47)	(1.62)	(1.37)
Total Debt % Common Equity	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]
	(0.85)	(0.48)	(0.18)	(0.75)	(0.77)	(0.52)	(1.27)	(0.27)	(0.65)	(0.93)	(0.76)	(0.18)
Total Loans % Total Assets	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]
	(1.24)	(1.56)	(1.35)	(1.52)	(1.43)	(1.61)	(1.22)	(1.43)	(1.39)	(1.31)	(1.41)	(1.35)
Price-to-Book	-0.003[c]	-0.002	-0.003[b]	-0.002	-0.002	-0.001	-0.002	-0.003[c]	-0.002[c]	-0.002	-0.002[c]	-0.003[b]
	[0.0014]	[0.0014]	[0.0014]	[0.0014]	[0.0014]	[0.0014]	[0.0013]	[0.0014]	[0.0013]	[0.0014]	[0.0014]	[0.0014]
	(-1.88)	(-1.46)	(-2.03)	(-1.15)	(-1.36)	(-0.86)	(-1.32)	(-1.82)	(-1.71)	(-1.36)	(-1.76)	(-2.03)
Relative Deal Size	-0.010	-0.010[c]	-0.010[c]	-0.010[c]	-0.010[c]	-0.009[c]	-0.010[b]	-0.010[c]	-0.010[b]	-0.010[b]	-0.010[b]	-0.010[c]
	[0.0051]	[0.0051]	[0.0052]	[0.0051]	[0.0051]	[0.0051]	[0.0051]	[0.0051]	[0.0051]	[0.0051]	[0.0052]	[0.0052]
	(-2.03)	(-1.90)	(-1.95)	(-1.90)	(-1.96)	(-1.83)	(-2.00)	(-1.90)	(-2.00)	(-2.01)	(-1.98)	(-1.95)

Stock-only financed deals	-0.003[c] [0.0016] (-1.70)	-0.003[b] [0.0016] (-2.09)	-0.003[b] [0.0016] (-1.98)	-0.003[c] [0.0015] (-1.80)	-0.003[c] [0.0015] (-1.68)	-0.003[b] [0.0016] (-1.98)	-0.002 [0.0015] (-1.36)	-0.003[c] [0.0016] (-1.73)	-0.002 [0.0016] (-1.60)	-0.003[c] [0.0015] (-1.84)	-0.003 [0.0016] (-1.63)	-0.003[b] [0.0016] (-1.98)
Intrastate deals	0.000 [0.0016] (0.20)	0.000 [0.0016] (0.26)	0.000 [0.0016] (0.24)	0.000 [0.0016] (0.26)	0.000 [0.0016] (0.22)	0.000 [0.0016] (0.30)	0.000 [0.0016] (0.18)	0.000 [0.0016] (0.16)	0.001 [0.0016] (0.36)	0.000 [0.0016] (0.19)	0.000 [0.0016] (0.23)	0.000 [0.0016] (0.24)
Industry focused deals	0.002 [0.0020] (0.89)	0.002 [0.0020] (0.85)	0.002 [0.0020] (1.09)	0.001 [0.0020] (0.71)	0.002[0.0020] (0.79)	0.001 [0.0020] (0.69)	0.002 [0.0020] (0.87)	0.002 [0.0020] (1.00)	0.002 [0.0020] (0.98)	0.001 [0.0020] (0.69)	0.002 [0.0020] (0.80)	0.002 [0.0020] (1.09)
Public Targets	-0.010[a] [0.0016] (-6.34)	-0.010[a] [0.0016] (-6.21)	-0.010[a] [0.0016] (-6.35)	-0.010[a] [0.0016] (-6.22)	-0.010[a] [0.0016] (-6.28)	-0.010[a] [0.0016] (-6.17)	-0.010[a] [0.0016] (-6.59)	-0.010[a] [0.0016] (-6.26)	-0.010[a] [0.0016] (-6.57)	-0.010[a] [0.0016] (-6.28)	-0.010[a] [0.0016] (-6.23)	-0.010[a] [0.0016] (-6.35)
Constant	-0.004 [0.0202] (-0.18)	-0.004 [0.0207] (-0.20)	0.017 [0.0196] (0.88)	0.003 [0.0191] (0.14)	0.005 [0.0190] (0.27)	0.013 [0.0183] (0.71)	0.009 [0.0181] (0.48)	0.016 [0.0192] (0.84)	0.002 [0.0189] (0.11)	-0.004 [0.0197] (-0.18)	0.022 [0.0179] (1.23)	0.017 [0.0196] (0.88)
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2759	2759	2759	2759	2759	2759	2759	2759	2759	2759	2759	2759
R^2	0.0749	0.0744	0.0709	0.0774	0.0763	0.0772	0.0788	0.0719	0.0778	0.0761	0.0742	0.0709
VIF	1.62	1.63	1.62	1.63	1.63	1.63	1.63	1.62	1.62	1.63	1.63	1.62

Note: This table reports the results derived from OLS regression models for the impact of categorical indices of Economic Policy Uncertainty (EPU) on the value creation upon bank M&A announcements. The dependent variable is the three-day (-1,1) acquirer Cumulative Abnormal Return (CAR) that is estimated using the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark. EPU is estimated by the natural logarithm of the three-month weighted mean BBD overall index for the year preceding the bank M&A announcements. The control variables that are used in the cross-sectional analysis include both bank-specific and deal-specific characteristics and are described in the Table 3. State-fixed effects are also included in the regression models. The coefficients derived from the regression analysis are reported in the first line of each independent variable. Standard errors are clustered using the two-way clustered method both at bank and at year level and are presented in brackets, whereas, *t*-values estimated using the double-clustering method are reported in parentheses. All variables are winsorized at the 1% and the 99% levels. The superscripts a, b and c denote significance at 1%, 5%, and 10% levels, respectively.

Results derived from the table 37 indicate that both news-based policy uncertainty and all other categorical indices of policy uncertainty are significantly positively associated with the acquirer's CAR upon the announcement of bank M&As. Specifically, news-based policy uncertainty, as a main component of the overall BBD index, has a positive impact on the shareholder value and the coefficient is significant (at the 1% level) and equal to 0.009. The economic interpretation of this result is that, assuming all other variables fixed to their average levels, a one standard deviation increase in news-based policy uncertainty above its average level increases the acquirer's announcement three-day CARs by about 29.2bps.

The same pattern is also presented for the categorical indices of policy uncertainty, suggesting that increases in the levels of categorical indices are significantly associated with increases in acquirer's CARs upon bank M&A announcements. With respect to the uncertainty associated with regulation, the results (column 10 and 11) show that a one standard deviation increase in the regulation (financial regulation) uncertainty is associated with an increase about 32.7bps (24.6bps) in shareholder wealth, assuming all other independent variables fixed at their average levels.

Monetary policy uncertainty constitutes a factor that affects the operation of the banking sector and in this context it is of primary importance to investigate the effect of Monetary Policy Uncertainty on the short-term performance of bank M&As. Both the categorical index of monetary policy (column 3) as well as the BBD MPU index (column 12) have a significant and positive impact on the acquirer's CARs, implying that increases in monetary uncertainty are associated with increases in shareholder wealth upon bank M&A announcements. With respect to the BBD MPU index, the economic interpretation is that a one standard deviation increase in the BBD MPU index increases the announcement acquirer's CARs by about 15.6bps. Therefore, monetary policy uncertainty positively affects the acquirer's shareholder wealth upon bank M&As.

6.5. Cross-sectional analysis for the impact of EPU on bid premiums

In the following sections, the effect of policy uncertainty on several deal-specific characteristics is analyzed. BID premiums capture the acquirer's willingness to pay for the acquisition of targets. In line with prior studies (Alexandridis et al., 2013; de La Bruslerie, 2013; Gregoriou et al., 2021; Humphery-Jenner and Powell, 2011; Jost et al., 2022; Levi et al., 2014; Perafán-Peña et al., 2022), bid premium (%) is measured for public targets as the excess of offer price over the stock price of targets four weeks before the deal announcement. Laamanen, (2007) showed that bid premiums estimated upon the announcement date are lower than those estimated over longer periods and they argued that longer periods may decrease the effects of pre-acquisition market's anticipation but they can also introduce noise. Pavićević and Keil (2021) argued that the selection of a four-week lag before the announcement for the

estimation of bid premiums reduces the effect of potential information leakage just before the announcement which affects the asset prices that in turn affect the estimation of bid-premiums. The impact of the policy uncertainty proxies on the bid premiums is assessed using cross-sectional analysis and the results are reported in the Table 38.

The results generally suggest that policy uncertainty is positively associated with the BID premiums and therefore increases in policy uncertainty are associated with increases in acquirer's CARs. However, news-based policy uncertainty, health care uncertainty and national security uncertainty have an insignificant impact on the bid premiums. Economic policy uncertainty, measured by the overall BBD index, has a positive and significant (at the 1% level) impact on the bid premiums. Therefore, acquirers tend to pay higher takeover premia during periods of high policy-related economic uncertainty. Economically, this result suggests that a one standard deviation increase in the overall BBD index, above its mean level, is associated with an increase of 4.18 percentage points in the level of bid premiums.

The positive impact of policy uncertainty on bid premiums was also confirmed by both Bonaime et al. (2018) and Adra et al. (2020). According to Bonaime et al. (2018), amid high policy uncertainty, acquirers who have the ability of delaying the M&As, they do so. As a result, the relative cost of acquirer's delays is more pronounced due to the "real options channel". In this context, targets, who anticipate the increase in relative cost, achieve better negotiation results in terms of bid premiums. Adra et al. (2020), who found that a one standard deviation increase in monetary policy uncertainty is associated with an increase of 6% in bid premiums, argued that monetary policy uncertainty decreases the acquirer's power of negotiation which in turn increases the bid premiums. Therefore, policy uncertainty strengthens (weakens) the bargaining power of targets (acquirers) and consequently affects the level of takeover premiums. Shams et al. (2022) also argued that policy uncertainty is positively associated with the bid premiums which can be attributed to increases in targets' bargaining power during periods of high economic policy uncertainty.

However, the positive association between policy uncertainty and bid premiums contradicts the findings of Nguyen and Phan (2017) who demonstrate a negative association. Authors suggested that, amid policy uncertainty, targets face difficulties which in turn first make acquirers negotiate better and second enhance the targets' willingness to accept lower premiums. Moreover, acquirers may also face financial constraints during periods of policy uncertainty and therefore they become more prudent with respect to the premiums paid upon M&As.

Table 38. The effect of both EPU and categorical indices of EPU on the bid premiums: A cross-sectional analysis

	(1) EPU BBD index	(2) News-based policy uncertainty	(3) Economic policy uncertainty	(4) Monetary policy	(5) Fiscal Policy	(6) Taxes	(7) Government Spending	(8) Health care	(9) National security	(10) Entitlement Programs	(11) Regulation	(12) Financial Regulation	(13) BBD MPU
EPU	16.460[a]	4.459	11.973[a]	7.533[a]	6.121[a]	6.476[a]	3.285[b]	1.299	2.938	3.613[c]	11.228[a]	5.046[a]	7.533[a]
	[4.8207]	[3.2178]	[3.1049]	[1.9282]	[2.2502]	[2.3761]	[1.3867]	[2.1556]	[2.0203]	[2.0511]	[3.5171]	[1.4906]	[1.9282]
	(3.41)	(1.39)	(3.86)	(3.91)	(2.72)	(2.73)	(2.37)	(0.60)	(1.45)	(1.76)	(3.19)	(3.39)	(3.91)
Total Assets	-4.239[a]	-4.188[a]	-4.171[a]	-3.947[a]	-4.262[a]	-4.271[a]	-4.239[a]	-4.194[a]	-4.207[a]	-4.055[a]	-4.239[a]	-4.166[a]	-3.947[a]
	[1.0455]	[1.0541]	[1.0445]	[1.0604]	[1.0461]	[1.0457]	[1.0494]	[1.0554]	[1.0526]	[1.0587]	[1.0397]	[1.0456]	[1.0604]
	(-4.05)	(-3.97)	(-3.99)	(-3.72)	(-4.07)	(-4.08)	(-4.04)	(-3.97)	(-4.00)	(-3.83)	(-4.08)	(-3.98)	(-3.72)
AGE	0.510	1.055	1.205	1.763	0.929	0.859	1.105	1.108	1.288	1.112	0.486	0.568	1.763
	[1.8032]	[1.8256]	[1.7782]	[1.7910]	[1.8074]	[1.8075]	[1.8074]	[1.8544]	[1.7926]	[1.7997]	[1.8082]	[1.7984]	[1.7910]
	(0.28)	(0.58)	(0.68)	(0.98)	(0.51)	(0.48)	(0.61)	(0.60)	(0.72)	(0.62)	(0.27)	(0.32)	(0.98)
Return on Assets	-7.103[c]	-8.488[b]	-7.883[b]	-9.515[a]	-7.951[b]	-7.929[b]	-8.462[b]	-8.801[b]	-9.301[b]	-8.844[b]	-6.992[c]	-6.984[c]	-9.515[a]
	[3.6795]	[3.6674]	[3.6634]	[3.6343]	[3.6662]	[3.6507]	[3.6622]	[3.6589]	[3.6326]	[3.6383]	[3.6734]	[3.6641]	[3.6343]
	(-1.93)	(-2.31)	(-2.15)	(-2.62)	(-2.17)	(-2.17)	(-2.31)	(-2.41)	(-2.56)	(-2.43)	(-1.90)	(-1.91)	(-2.62)
Reserve for Loan Losses % Total Loans	5.010[b]	5.151[b]	3.924[c]	4.210[b]	4.630[b]	4.759[b]	4.439[b]	4.952[b]	4.800[b]	4.655[b]	4.715[c]	4.847[b]	4.210[b]
	[2.0362]	[2.0747]	[2.0204]	[2.0403]	[2.0256]	[2.0180]	[2.0614]	[2.0753]	[2.0641]	[2.0543]	[2.0176]	[2.0397]	[2.0403]
	(2.46)	(2.48)	(1.94)	(2.06)	(2.29)	(2.36)	(2.15)	(2.39)	(2.33)	(2.27)	(2.34)	(2.38)	(2.06)
Total Debt % Common Equity	-0.014	-0.017[c]	-0.017[c]	-0.022[b]	-0.016[c]	-0.016[c]	-0.018[b]	-0.018[c]	-0.019[b]	-0.018[b]	-0.014	-0.014	-0.022[b]
	[0.0089]	[0.0090]	[0.0089]	[0.0091]	[0.0089]	[0.0089]	[0.0090]	[0.0091]	[0.0091]	[0.0090]	[0.0089]	[0.0090]	[0.0091]
	(-1.56)	(-1.88)	(-1.91)	(-2.40)	(-1.82)	(-1.80)	(-1.99)	(-1.93)	(-2.14)	(-1.97)	(-1.54)	(-1.54)	(-2.40)
Total Loans % Total Assets	-0.337[b]	-0.337[b]	-0.309[b]	-0.318[b]	-0.323[b]	-0.327[b]	-0.321[b]	-0.336[b]	-0.326[b]	-0.328[b]	-0.321[b]	-0.298[b]	-0.318[b]
	[0.1334]	[0.1348]	[0.1320]	[0.1327]	[0.1333]	[0.1336]	[0.1337]	[0.1351]	[0.1338]	[0.1341]	[0.1330]	[0.1342]	[0.1327]
	(-2.52)	(-2.50)	(-2.34)	(-2.40)	(-2.42)	(-2.45)	(-2.40)	(-2.49)	(-2.44)	(-2.44)	(-2.42)	(-2.22)	(-2.40)
Price-to-Book	1.376	0.505	1.523	0.874	1.331	1.250	1.360	0.505	0.733	0.651	1.590	1.128	0.874
	[1.6417]	[1.5684]	[1.6416]	[1.6265]	[1.6000]	[1.5908]	[1.6273]	[1.5923]	[1.5583]	[1.5836]	[1.6196]	[1.5729]	[1.6265]
	(0.84)	(0.32)	(0.93)	(0.54)	(0.83)	(0.79)	(0.84)	(0.32)	(0.47)	(0.41)	(0.98)	(0.72)	(0.54)
Relative Deal Size	-24.075[a]	-24.278[a]	-23.492[a]	-23.690[a]	-23.831[a]	-23.958[a]	-23.821[a]	-24.232[a]	-24.044[a]	-24.063[a]	-24.047[a]	-24.319[a]	-23.690[a]
	[3.9330]	[3.9978]	[3.9177]	[3.9819]	[3.9182]	[3.9158]	[3.9291]	[3.9853]	[3.9855]	[3.9675]	[3.9228]	[3.9419]	[3.9819]
	(-6.12)	(-6.07)	(-6.00)	(-5.95)	(-6.08)	(-6.12)	(-6.06)	(-6.08)	(-6.03)	(-6.06)	(-6.13)	(-6.17)	(-5.95)

Stock-only financed deals	-4.014[c] [2.2507] (-1.78)	-4.100[c] [2.2656] (-1.81)	-4.654[b] [2.2450] (-2.07)	-4.447[b] [2.2480] (-1.98)	-4.120[c] [2.2553] (-1.83)	-3.985[c] [2.2561] (-1.77)	-4.194[c] [2.2599] (-1.86)	-4.010[c] [2.2786] (-1.76)	-3.856[c] [2.2768] (-1.69)	-4.013[c] [2.2685] (-1.77)	-4.284[c] [2.2497] (-1.90)	-3.792[c] [2.2605] (-1.68)	-4.447[b] [2.2480] (-1.98)
Intrastate deals	0.887 [2.7255] (0.33)	0.772 [2.7574] (0.28)	1.008 [2.7318] (0.37)	0.780 [2.7445] (0.28)	0.903 [2.7475] (0.33)	0.873 [2.7438] (0.32)	0.939 [2.7579] (0.34)	0.736 [2.7624] (0.27)	0.813 [2.7578] (0.29)	0.898 [2.7691] (0.32)	0.952 [2.7452] (0.35)	0.977 [2.7507] (0.36)	0.780 [2.7445] (0.28)
Industry focused deals	2.041 [3.0469] (0.67)	2.938 [3.0526] (0.96)	2.107 [3.0325] (0.69)	2.761 [2.9996] (0.92)	2.285 [3.0512] (0.75)	2.382 [3.0466] (0.78)	2.406 [3.0288] (0.79)	3.207 [3.0044] (1.07)	3.256 [3.0060] (1.08)	2.860 [3.0183] (0.95)	2.004 [3.0644] (0.65)	2.119 [3.0403] (0.70)	2.761 [2.9996] (0.92)
Constant	84.362[a] [30.7284] (2.75)	136.071[a] [28.1785] (4.83)	98.356[a] [28.0675] (3.50)	111.843[a] [27.6260] (4.05)	129.863[a] [26.3927] (4.92)	129.011[a] [26.4595] (4.88)	141.913[a] [25.8310] (5.49)	150.700[a] [26.8466] (5.61)	142.135[a] [26.0509] (5.46)	136.483[a] [27.7782] (4.91)	108.169[a] [28.7750] (3.76)	134.790[a] [26.0980] (5.16)	111.843[a] [27.6260] (4.05)
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1103	1103	1103	1103	1103	1103	1103	1103	1103	1103	1103	1103	1103
R^2	0.1394	0.1301	0.1415	0.1391	0.1349	0.1353	0.1326	0.1289	0.1302	0.1314	0.1394	0.1390	0.1391
Mean VIF	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87

Note: This table reports the results derived from OLS regression models for the impact of both Economic Policy Uncertainty (EPU) and categorical indices of EPU on the bid premiums. Bid premiums are estimated as the transaction value scaled to the targets' market capitalization four weeks before the announcement. EPU is estimated by the natural logarithm of the three-month weighted mean BBD overall index for the year preceding the bank M&A announcements. The control variables that are used in the cross-sectional analysis include both bank-specific and deal-specific characteristics and are described in the Table 3. State-fixed effects are also included in the regression models. The coefficients derived from the regression analysis are reported in the first line of each independent variable. Standard errors are clustered using the two-way clustered method both at bank and at year level and are presented in brackets, whereas, *t*-values estimated using the double-clustering method are reported in parentheses. All variables are winsorized at the 1% and the 99% levels. The superscripts a, b and c denote significance at 1%, 5%, and 10% levels, respectively.

With respect to the other determinants of takeover premiums, the results indicate that acquirer's size (total assets) has a negative and significant (at the 1% level) impact on takeover premiums suggesting that large bank acquirers tend to pay lower bid premiums. This negative association between bid premiums and acquirer's size is also supported by Adra et al. (2020) who using a sample of M&As in the U.S.A. found that acquirers' size, measured by the acquirers' market value, had a negative impact on the takeover premiums. However, the above result contradicts the findings of both Moeller et al. (2004) and Alexandridis et al. (2013) who argued that large acquirers tend to pay higher premiums.

Acquirer's ROA, ratio of total debt to common equity as well as ratio of total loans to total assets have also a negative and significant impact on the bid premiums. On the other hand, the ratio of reserves for loan losses to total loans is significantly positively associated with the levels of bid premiums.

Considering the effect of deal-specific characteristics on bid premiums, the relative deal size has a negative and significant (at the 1% level) impact on bid premiums which implies that acquirers which engage in large deals tend to pay lower takeover premiums. Furthermore, the selection of stock-only financed deals is also negatively associated with the bid premiums.

6.6. Cross-sectional analysis for the impact of EPU on the stock-only financed M&As

To investigate whether the level of policy uncertainty affects the selection of payment method upon bank M&As, several probit models are applied. Stock-only dummy takes the value of 1 for deals with stock-only method of payment and 0 otherwise. Table 39 reports the results for probit models that analyze the impact of policy uncertainty on the selection of stock-only method of payment.

The results shown in Table 39 provide evidence that overall BBD economic policy uncertainty is negatively associated with the selection of stock-only as method of payment, implying that during periods of high overall uncertainty banks avoid to select the stock-only as deal payment method.

Table 39. The effect of both EPU and categorical indices of EPU on the selection of stock-only financed bank M&As

	(1) EPU BBD index	(2) News-based policy uncertainty	(3) Economic policy uncertainty	(4) Monetary policy	(5) Fiscal Policy	(6) Taxes	(7) Government Spending	(8) Health care	(9) National security	(10) Entitlement Programs	(11) Regulation	(12) Financial Regulation	(13) BBD MPU
EPU	-0.300[b]	-0.175[b]	0.270[a]	0.173[a]	-0.033	-0.124[b]	0.053	-0.236[a]	-0.136[b]	-0.131[a]	-0.020	-0.111[a]	0.173[a]
	[0.1174]	[0.0854]	[0.0802]	[0.0544]	[0.0575]	[0.0594]	[0.0378]	[0.0468]	[0.0527]	[0.0487]	[0.0793]	[0.0353]	[0.0544]
	(-2.56)	(-2.05)	(3.37)	(3.18)	(-0.57)	(-2.09)	(1.42)	(-5.05)	(-2.58)	(-2.69)	(-0.25)	(-3.15)	(3.18)
Total Assets	0.055[b]	0.052[b]	0.050[c]	0.056[b]	0.050[c]	0.052[b]	0.049[c]	0.053[b]	0.050[c]	0.046[c]	0.050[c]	0.054[b]	0.056[b]
	[0.0259]	[0.0259]	[0.0258]	[0.0259]	[0.0259]	[0.0259]	[0.0258]	[0.0258]	[0.0258]	[0.0259]	[0.0259]	[0.0259]	[0.0259]
	(2.10)	(2.02)	(1.92)	(2.15)	(1.95)	(2.02)	(1.89)	(2.07)	(1.93)	(1.79)	(1.94)	(2.08)	(2.15)
AGE	0.002	-0.001	-0.015	-0.005	-0.008	-0.001	-0.013	0.019	-0.008	-0.002	-0.009	0.003	-0.005
	[0.0397]	[0.0396]	[0.0396]	[0.0397]	[0.0396]	[0.0396]	[0.0396]	[0.0398]	[0.0394]	[0.0395]	[0.0397]	[0.0397]	[0.0397]
	(0.06)	(-0.03)	(-0.39)	(-0.13)	(-0.19)	(-0.03)	(-0.33)	(0.47)	(-0.19)	(-0.05)	(-0.22)	(0.09)	(-0.13)
Return on Assets	-0.158[c]	-0.151[c]	-0.125	-0.152[c]	-0.138	-0.149[c]	-0.134	-0.153[c]	-0.121	-0.135	-0.137	-0.171[b]	-0.152[c]
	[0.0856]	[0.0855]	[0.0853]	[0.0855]	[0.0854]	[0.0853]	[0.0855]	[0.0854]	[0.0860]	[0.0853]	[0.0857]	[0.0859]	[0.0855]
	(-1.85)	(-1.77)	(-1.47)	(-1.78)	(-1.61)	(-1.74)	(-1.57)	(-1.79)	(-1.40)	(-1.58)	(-1.60)	(-1.99)	(-1.78)
Reserve for Loan Losses % Total Loans	0.071[c]	0.069[c]	0.057	0.063	0.076[c]	0.077[b]	0.069[c]	0.085[b]	0.084[b]	0.081[b]	0.075[c]	0.072[c]	0.063
	[0.0386]	[0.0388]	[0.0395]	[0.0396]	[0.0388]	[0.0386]	[0.0393]	[0.0388]	[0.0391]	[0.0386]	[0.0388]	[0.0384]	[0.0396]
	(1.85)	(1.77)	(1.44)	(1.59)	(1.96)	(1.98)	(1.76)	(2.18)	(2.15)	(2.11)	(1.94)	(1.88)	(1.59)
Total Debt % Common Equity	-0.001[a]	-0.001[a]	-0.001[a]	-0.001[a]	-0.001[a]	-0.001[a]	-0.001[a]	-0.001[a]	-0.001[a]	-0.001[a]	-0.001[a]	-0.001[a]	-0.001[a]
	[0.0002]	[0.0002]	[0.0002]	[0.0002]	[0.0002]	[0.0002]	[0.0002]	[0.0002]	[0.0002]	[0.0002]	[0.0002]	[0.0002]	[0.0002]
	(-3.58)	(-3.52)	(-3.13)	(-3.53)	(-3.29)	(-3.44)	(-3.21)	(-4.04)	(-3.16)	(-3.39)	(-3.26)	(-3.61)	(-3.53)
Total Loans % Total Assets	-0.006[b]	-0.006[b]	-0.005	-0.005[c]	-0.006[b]	-0.006[b]	-0.006[c]	-0.006[c]	-0.007[b]	-0.006[b]	-0.006[b]	-0.006[b]	-0.005[c]
	[0.0029]	[0.0029]	[0.0030]	[0.0030]	[0.0029]	[0.0029]	[0.0030]	[0.0029]	[0.0029]	[0.0029]	[0.0029]	[0.0029]	[0.0030]
	(-2.09)	(-2.02)	(-1.65)	(-1.78)	(-2.06)	(-2.12)	(-1.88)	(-1.96)	(-2.26)	(-2.10)	(-2.03)	(-2.20)	(-1.78)
Price-to-Book	0.342[a]	0.358[a]	0.419[a]	0.399[a]	0.365[a]	0.347[a]	0.399[a]	0.317[a]	0.348[a]	0.351[a]	0.370[a]	0.345[a]	0.399[a]
	[0.0485]	[0.0475]	[0.0498]	[0.0481]	[0.0493]	[0.0487]	[0.0508]	[0.0477]	[0.0480]	[0.0474]	[0.0489]	[0.0476]	[0.0481]
	(7.06)	(7.53)	(8.41)	(8.29)	(7.40)	(7.13)	(7.85)	(6.64)	(7.26)	(7.40)	(7.57)	(7.25)	(8.29)
Relative Deal Size	0.205[c]	0.208[c]	0.223[c]	0.217[c]	0.202[c]	0.199	0.216[c]	0.200	0.184	0.204[c]	0.205[c]	0.203[c]	0.217[c]
	[0.1217]	[0.1218]	[0.1223]	[0.1218]	[0.1218]	[0.1219]	[0.1220]	[0.1225]	[0.1223]	[0.1222]	[0.1219]	[0.1219]	[0.1218]
	(1.68)	(1.70)	(1.82)	(1.78)	(1.66)	(1.63)	(1.77)	(1.63)	(1.50)	(1.67)	(1.68)	(1.66)	(1.78)

Intrastate deals	0.029 [0.0590] (0.49)	0.029 [0.0589] (0.50)	0.032 [0.0591] (0.54)	0.031 [0.0590] (0.53)	0.029 [0.0590] (0.48)	0.028 [0.0590] (0.48)	0.031 [0.0590] (0.53)	0.029 [0.0590] (0.50)	0.032 [0.0590] (0.54)	0.023 [0.0590] (0.39)	0.029 [0.0590] (0.49)	0.028 [0.0591] (0.48)	0.031 [0.0590] (0.53)
Industry focused deals	0.362[a] [0.0723] (5.01)	0.357[a] [0.0721] (4.94)	0.331[a] [0.0719] (4.60)	0.344[a] [0.0718] (4.79)	0.351[a] [0.0720] (4.88)	0.358[a] [0.0722] (4.97)	0.339[a] [0.0720] (4.71)	0.363[a] [0.0723] (5.01)	0.357[a] [0.0721] (4.94)	0.352[a] [0.0720] (4.89)	0.350[a] [0.0721] (4.85)	0.368[a] [0.0725] (5.07)	0.344[a] [0.0718] (4.79)
Public Targets	0.328[a] [0.0575] (5.71)	0.332[a] [0.0574] (5.78)	0.341[a] [0.0575] (5.94)	0.334[a] [0.0574] (5.83)	0.332[a] [0.0574] (5.79)	0.330[a] [0.0574] (5.75)	0.337[a] [0.0574] (5.87)	0.346[a] [0.0575] (6.03)	0.328[a] [0.0575] (5.70)	0.339[a] [0.0574] (5.90)	0.333[a] [0.0574] (5.80)	0.326[a] [0.0576] (5.67)	0.334[a] [0.0574] (5.83)
Constant	-0.066 [0.7454] (-0.09)	-0.591 [0.6643] (-0.89)	-2.641[a] [0.6825] (-3.87)	-2.310[a] [0.6364] (-3.63)	-1.190[c] [0.6081] (-1.96)	-0.817 [0.6086] (-1.34)	-1.572[a] [0.5806] (-2.71)	-0.459 [0.5768] (-0.80)	-0.677 [0.6146] (-1.10)	-0.673 [0.6015] (-1.12)	-1.250[c] [0.6446] (-1.94)	-0.957[c] [0.5687] (-1.68)	-2.310[a] [0.6364] (-3.63)
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2738	2738	2738	2738	2738	2738	2738	2738	2738	2738	2738	2738	2738
Pseudo R^2	0.0941	0.0935	0.0956	0.0953	0.0923	0.0935	0.0928	0.0993	0.0942	0.0943	0.0922	0.0952	0.0953
Wald Chi^2	281.03	277.77	278.67	280.32	272.78	277.22	274.41	294.27	279.83	276.17	272.69	282.55	280.32

Note: This table reports the results derived from a Probit model that is used to investigate the impact of both Economic Policy Uncertainty (EPU) and categorical indices of EPU on the selection of stock-only financed deals. The dependent variable STOCK is a dummy variable that is assigned the value of 1 for bank M&As with stock-only as method of payment and 0 otherwise. EPU is estimated by the natural logarithm of the three-month weighted mean BBD overall index for the year preceding the bank M&A announcements. The control variables that are used in the analysis include both bank-specific and deal-specific characteristics and are described in the Table 3. State-fixed effects are also included in the regression models. The coefficients derived from the regression analysis are reported in the first line of each independent variable. Standard errors are clustered using the two-way clustered method both at bank and at year level and are presented in brackets, whereas, *z*-values estimated using the double-clustering method are reported in parentheses. All variables are winsorized at the 1% and the 99% levels. The superscripts a, b and c denote significance at 1%, 5%, and 10% levels, respectively.

The results show that acquirers, amid periods of high overall economic policy uncertainty, tend to use cash or a combination of cash and stock as method of deal payment. However, this negative association between the overall BBD index for economic policy uncertainty and the selection of stock-only financed acquisitions contradicts findings from previous studies for the market of corporate control (Nguyen and Phan, 2017; Shams et al., 2022).

Prior studies argued that the choice of deal payment depends on the acquirers' beliefs towards the value of their equity. In particular, acquirers who believe that their equity is undervalued will select cash as mean of payment, whereas they will prefer stock when they believe that their stock is overvalued (Amihud et al., 1990; Hansen, 1987; Myers and Majluf, 1984; Travlos, 1987). Chemmanur et al. (2009) using a sample of U.S. acquisitions over the period 1978-2004 showed that acquirers with overvalued equity tend to select stock-financed acquisitions, whereas acquirers with correctly valued equity tend to select cash-financed acquisitions.

Karampatsas et al. (2014) argued that the propensity for cash-financed acquisitions is positively affected by the acquirers' credit rating which implies that acquirers with higher credit ratings and hence acquirers with lower financial constraints are more likely to select cash-financed acquisitions. In this context, to analyze the choices for deal payment and the acquirers' decisions for using stock, de Bodt et al. (2022) argued that for their decision there is a tradeoff between acquirers' financial constraints (which motive acquirers to use stock) and the ownership dilution (which makes acquirers to avoid the usage of their own stock).

Generally, reductions in interest rates and therefore in cost of raising cash motivates acquirers to select cash as payment method (de Bodt et al., 2022). Indeed, in periods of economic uncertainty (e.g. after attacks of the September 11th, 2001, during the 2008 financial crisis, etc.), there were sharp declines in interest rates which could incentivize acquirers to select cash for deal payments. Moreover, bank acquirers is likely to worry about the result of ownership dilution and the possibility of loss of corporate control which can constitute a disincentive for the selection of stock-only financed acquisitions (Amihud et al., 1990; de Bodt et al., 2022).

In particular, when acquirers consider as important the preservation of corporate control then they will be motivated to use cash as mean of deal payment (Faccio and Masulis, 2005). In this context, it is likely that, amid periods of high overall economic policy uncertainty, banks seek to take advantages of M&A activity (synergies, improvements in operating efficiency, better financial position, etc) maintaining, however, the ownership control of banks fact that explains the above finding.

Luypaert and Van Caneghem (2017) demonstrated that information asymmetry matter in the selection of deal payment method. Acquirers who face high levels of targets'

information asymmetry prefer to select cash as mean of deal payment. They also argued that when acquirers have superior information for their targets and aim to receive a higher proportion of the total M&A gains, they are more likely to opt for cash so as to avoid sharing the gains with targets' shareholders. Therefore, the possibility of either higher targets' information asymmetry or higher expected gains from M&As could motivate acquirers to offer cash payments. In essence, during periods of high policy uncertainty there is evidence that bank M&A announcements are associated with greater acquirers' shareholder value which implies that acquirers of cash-only financed acquisitions solely exploit these additional market gains.

The negative association between policy uncertainty and selection of stock-only financed acquisitions is also documented using the proxies of broad news-based policy uncertainty, taxes uncertainty, healthcare uncertainty, national security uncertainty, entitlement program uncertainty and financial regulation uncertainty.

On the other hand, there are three sub-indices with inverse impact on the selection of stock-only financed M&As. In particular, economic policy uncertainty[27], monetary policy and BBD Monetary Policy Uncertainty (BBD MPU) index have a positive and significant (at the 1% level) impact on the selection of stock-only financed deals. The results imply that amid periods of high monetary uncertainty acquirers tend to use stock-only as mean for deal payment.

Indeed, monetary policy has impact on the firms' financial constraints and on the cost of firms' financing (Foley-Fisher et al., 2016; Naqvi and Pungaliya, 2023) which in turn can affect the acquirers' choices of deal payment. Specifically, acquirers select between cash financing (which mainly requires issuing debt) and equity financing (Faccio and Masulis, 2005). According to Obonyo (2022) monetary policy constitute a determinants for M&A outcomes. Using a sample of cross-border acquisitions of U.S. targets they showed that acquirers who face restrictive monetary policy in their country are less likely to select cash-financed acquisitions. In this context, prior studies demonstrated that uncertainty related to monetary policy affect the cost of debt financing and the financing decisions (Husted et al., 2020; Luo et al., 2022; Xiang and Li, 2022).

Considering the effect of monetary policy uncertainty on the method of deal payment, the positive association between policy uncertainty and selection of stock-financed acquisitions is also supported by Nguyen and Phan (2017) who argued that economic policy uncertainty can increase the acquirers' cost of external financing which in turn

[27] The different sign of coefficients between the broad news-based uncertainty (negative) and the economic policy uncertainty (positive) may be attributed to the different way of measurement between the above indices. Specifically, broad news-based uncertainty index is based on search results that derived from ten large newspapers in the U.S., whereas the categorical index of economic policy uncertainty is based on news data that derived from 2,000 newspapers in the U.S. For more details: https://www.policyuncertainty.com/us_monthly.html (Assessed on 30 March 2022).

increases their financial constraints whilst policy uncertainty also increases the acquirers' necessity for cash reserves due to the volatility of future cash flows. Therefore, policy uncertainty can make it difficult for acquirers to use cash as payment method because they hold cash as a precautionary measure (Phan et al., 2019). In this context, Shams et al. (2022) also suggested that economic policy uncertainty is positively associated with the selection of stock-financed deals whereas de Bodt et al. (2022) provided evidence that financial constraints motivate acquirers to use stock as method of payment.

With respect to the bank-specific determinants, bank size (measured by total assets) is positively associated with the selection of stock-only as method of payment suggesting that large acquirers tend to engage in stock-financed M&As. There is also evidence that reserves for loan losses to total loans is positively associated with the selection of stock as method of payment whereas both return on assets and total loans to total assets are negatively associated with the selection of stock-financed acquisitions. The ratio of total debt to common equity has a negative and significant (at the 1% level) impact on the selection of stock-financed acquisitions which implies that high-leveraged acquirers are not willing to use stock as a method of deal payment. On the contrary, high valuation acquirers (measured with the price to book ratio) are significantly (at the 1% level) positively associated with the selection of stock-financed deals. This result is also supported by Dong et al., (2006) who state that acquirer's valuation had a significant and positive impact on stock-financed deals.

6.7. Cross-sectional analysis for the impact of EPU on the time to completion

The time to completion, measured by the number of days between the announcement and the effective (completion) date, constitutes a characteristic of M&As that is used to evaluate the level of complexity towards the completion of a deal. Table 40 presents the regression results for the impact of policy uncertainty on the time to completion.

Table 40. The effect of both EPU and categorical indices of EPU on the time to completion

	(1) EPU BBD index	(2) News-based policy uncertainty	(3) Economic policy uncertainty	(4) Monetary policy	(5) Fiscal Policy	(6) Taxes	(7) Government Spending	(8) Health care	(9) National security	(10) Entitlement Programs	(11) Regulation	(12) Financial Regulation	(13) BBD MPU
EPU	14.845[b]	-1.728	16.568[a]	5.292[c]	8.643[a]	5.962[c]	9.054[a]	-9.040[a]	14.224[a]	-10.718[a]	2.492	6.975[a]	5.292[c]
	[5.9196]	[4.1200]	[4.2095]	[2.7270]	[2.9734]	[3.1132]	[1.9514]	[2.9986]	[2.7646]	[2.8288]	[4.1210]	[1.8888]	[2.7270]
	(2.51)	(-0.42)	(3.94)	(1.94)	(2.91)	(1.92)	(4.64)	(-3.01)	(5.15)	(-3.79)	(0.60)	(3.69)	(1.94)
Total Assets	0.179	0.468	0.410	0.620	0.271	0.311	0.252	0.590	0.432	0.179	0.387	0.155	0.620
	[1.3059]	[1.3041]	[1.3051]	[1.3190]	[1.3038]	[1.3042]	[1.3024]	[1.3060]	[1.2992]	[1.3150]	[1.3076]	[1.3012]	[1.3190]
	(0.14)	-0.36)	(0.31)	(0.47)	(0.21)	(0.24)	(0.19)	(0.45)	(0.33)	(0.14)	(0.30)	(0.12)	(0.47)
AGE	0.537	1.178	0.837	1.270	0.587	0.716	0.571	2.177	0.975	1.739	0.973	0.331	1.270
	[1.8483]	[1.8460]	[1.8268]	[1.8223]	[1.8457]	[1.8456]	[1.8410]	[1.8645]	[1.8193]	[1.8430]	[1.8355]	[1.8384]	[1.8223]
	(0.29)	(0.64)	(0.46)	(0.70)	(0.32)	(0.39)	(0.31)	(1.17)	(0.54)	(0.94)	(0.53)	(0.18)	(0.70)
Return on Assets	4.133	2.730	3.592	2.433	3.792	3.592	3.149	2.137	1.436	2.785	3.233	5.173	2.433
	[4.7137]	[4.7203]	[4.7030]	[4.7513]	[4.7048]	[4.7054]	[4.7038]	[4.7267]	[4.7271]	[4.7174]	[4.7194]	[4.7286]	[4.7513]
	(0.88)	(0.58)	(0.76)	(0.51)	(0.81)	(0.76)	(0.67)	(0.45)	(0.30)	(0.59)	(0.69)	(1.09)	(0.51)
Reserve for Loan Losses % Total Loans	7.882[a]	7.662[a]	6.583[a]	7.334[a]	7.423[a]	7.631[a]	6.704[a]	8.113[a]	6.750[a]	8.281[a]	7.688[a]	7.831[a]	7.334[a]
	[2.4988]	[2.5202]	[2.5025]	[2.5117]	[2.5071]	[2.4975]	[2.5338]	[2.4634	[2.4535]	[2.4424]	[2.4970]	[2.5104]	[2.5117]
	(3.15)	(3.04)	(2.63)	(2.92)	(2.96)	(3.06)	(2.65)	(3.29)	(2.75)	(3.39)	(3.08)	(3.12)	(2.92)
Total Debt % Common Equity	-0.006	-0.010	-0.008	-0.012	-0.007	-0.007	-0.007	-0.018	-0.012	-0.013	-0.009	-0.004	-0.012
	[0.0127]	[0.0126]	[0.0126]	[0.0127]	[0.0126]	[0.0126]	[0.0126]	[0.0125]	[0.0125]	[0.0123]	[0.0126]	[0.0127]	[0.0127]
	(-0.44)	(-0.82)	(-0.63)	(-0.93)	(-0.51)	(-0.58)	(-0.60)	(-1.44)	(-0.96)	(-1.05)	(-0.68)	(-0.32)	(-0.93)
Total Loans % Total Assets	-0.040	-0.049	0.016	-0.029	-0.017	-0.034	0.019	-0.047	0.025	-0.072	-0.047	-0.017	-0.029
	[0.1476]	[0.1474]	[0.1481]	[0.1476]	[0.1479]	[0.1477]	[0.1480]	[0.1471]	[0.1481]	[0.1470]	[0.1475]	[0.1474]	[0.1476]
	(-0.27)	(-0.33)	(0.11)	(-0.20)	(-0.12)	(-0.23)	(0.13)	(-0.32)	(0.17)	(-0.49)	(-0.32)	(-0.11)	(-0.20)
Price-to-Book	-10.468[a]	-11.862[a]	-9.358[a]	-11.140[a]	-9.852[a]	-10.639[a]	-7.892[a]	-13.636[a]	-9.347[a]	-13.226[a]	-11.400[a]	-10.255[a]	-11.140[a]
	[2.1381]	[2.1952]	[2.1188]	[2.1418]	[2.1760]	[2.2029]	[2.1505]	[2.4274]	[2.1347]	[2.3385]	[2.2491]	[2.1117]	[2.1418]
	(-4.90)	(-5.40)	(-4.42)	(-5.20)	(-4.53)	(-4.83)	(-3.67)	(-5.62)	(-4.38)	(-5.66)	(-5.07)	(-4.86)	(-5.20)
Relative Deal Size	16.548[b]	16.591[b]	17.606[a]	16.972[a]	17.160[a]	16.773[a]	18.222[a]	16.490[b]	18.501[a]	16.548[b]	16.561[b]	16.669[a]	16.972[a]
	[6.4270]	[6.4383]	[6.4425]	[6.4475]	[6.4413]	[6.4410]	[6.4274]	[6.4743]	[6.4138]	[6.4446]	[6.4398]	[6.4099]	[6.4475]
	(2.57)	(2.58)	(2.73)	(2.63)	(2.66)	(2.60)	(2.84)	(2.55)	(2.88)	(2.57)	(2.57)	(2.60)	(2.63)

Stock-only financed deals	16.605[a]	16.141[a]	15.460[a]	15.854[a]	16.344[a]	16.465[a]	15.893[a]	15.093[a]	17.066[a]	15.454[a]	16.212[a]	16.976[a]	15.854[a]
	[2.8941]	[2.8921]	[2.8758]	[2.8863]	[2.8842]	[2.8963]	[2.8722]	[2.9189]	[2.8814]	[2.8905]	[2.8904]	[2.8928]	[2.8863]
	(5.74)	(5.58)	(5.38)	(5.49)	(5.67)	(5.68)	(5.53)	(5.17)	(5.92)	(5.35)	(5.61)	(5.87)	(5.49)
Intrastate deals	5.335	5.357	5.497[c]	5.420	5.435[c]	5.365	5.625[c]	5.426[c]	5.026	4.944	5.342	5.394	5.420
	[3.2954]	[3.2928]	[3.2918]	[3.2932]	[3.2934]	[3.2960]	[3.2824]	[3.2774]	[3.2771]	[3.2730]	[3.2959]	[3.2930]	[3.2932]
	(1.62)	(1.63)	(1.67)	(1.65)	(1.65)	(1.63)	(1.71)	(1.66)	(1.53)	(1.51)	(1.62)	(1.64)	(1.65)
Industry focused deals	32.718[a]	33.593[a]	32.360[a]	33.388[a]	32.521[a]	32.926[a]	31.824[a]	34.188[a]	32.544[a]	33.994[a]	33.271[a]	32.193[a]	33.388[a]
	[4.0302]	[4.0318]	[4.0199]	[4.0127]	[4.0503]	[4.0512]	[4.0362]	[4.0494]	[3.9912]	[3.9995]	[4.0508]	[4.0126]	[4.0127]
	(8.12)	(8.33)	(8.05)	(8.32)	(8.03)	(8.13)	(7.88)	(8.44)	(8.15)	(8.50)	(8.21)	(8.02)	(8.32)
Public Targets	17.805[a]	17.607[a]	18.035[a]	17.589[a]	17.862[a]	17.713[a]	18.149[a]	18.114[a]	18.080[a]	18.143[a]	17.652[a]	18.001[a]	17.589[a]
	[3.1562]	[3.1537]	[3.1515]	[3.1553]	[3.1551]	[3.1586]	[3.1376]	[3.1337]	[3.1456]	[3.1288]	[3.1575]	[3.1443]	[3.1553]
	(5.64)	(5.58)	(5.72)	(5.57)	(5.66)	(5.61)	(5.78)	(5.78)	(5.75)	(5.80)	(5.59)	(5.72)	(5.57)
Constant	44.988	114.152[a]	27.569	77.132[b]	70.370[b]	82.574[b]	67.385[b]	140.512[a]	38.424	160.315[a]	96.888[a]	83.928[a]	77.132[b]
	[39.8780]	[36.3070]	[37.0406]	[34.8146]	[33.6967]	[33.8658]	[32.2652]	[34.2131]	[33.4467]	[35.5971]	[35.6749]	[31.7349]	[34.8146]
	(1.13)	(3.14)	(0.74)	(2.22)	(2.09)	(2.44)	(2.09)	(4.11)	(1.15)	(4.50)	(2.72)	(2.64)	(2.22)
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2759	2759	2759	2759	2759	2759	2759	2759	2759	2759	2759	2759	2759
R^2	0.1353	0.1333	0.1388	0.1345	0.1361	0.1345	0.1407	0.1377	0.1427	0.1394	0.1334	0.1383	0.1345
Mean VIF	1.63	1.62	1.63	1.62	1.63	1.63	1.63	1.63	1.62	1.62	1.63	1.63	1.62

Note: This table reports the results derived from a OLS model that is used to investigate the impact of both Economic Policy Uncertainty (EPU) and categorical indices of EPU on the time to completion. The dependent variable DAYS TO COMPLETION is measured as the number of days between the announcement and the completion (effective) date of each deal. EPU is estimated by the natural logarithm of the three-month weighted mean BBD overall index for the year preceding the bank M&A announcements. The control variables that are used in the analysis include both bank-specific and deal-specific characteristics and are described in the Table 3. State-fixed effects are also included in the regression models. The coefficients derived from the regression analysis are reported in the first line of each independent variable. Standard errors are clustered using the two-way clustered method both at bank and at year level and are presented in brackets, whereas, *t*-values estimated using the double-clustering method are reported in parentheses. All variables are winsorized at the 1% and the 99% levels. The superscripts a, b and c denote significance at 1%, 5%, and 10% levels, respectively.

According to the results, overall BBD index is significant and positively associated with the time to completions, implying that during periods of high uncertainty banks that announced M&As need more time in order to complete the deal. This result is also supported using alternative categorical proxies of uncertainty such as economic policy uncertainty, monetary policy uncertainty, fiscal policy uncertainty, uncertainty related to taxes, government spending uncertainty, national security uncertainty, financial regulation uncertainty and BBD MPU have a statistically significant and positive impact on the time to completion. On the other hand, two proxies of uncertainty namely the healthcare uncertainty and the entitlement programs related uncertainty have a negative and significant impact on the time to completion. Therefore, bank M&A announcements either during periods of high healthcare uncertainty or during periods of high entitlement programs related uncertainty are associated with faster completions.

With respect to the bank-specific variables, the results provide evidence that the bank risk (measured by reserves for loan losses to total loans) has a positive and significant impact on the time to completions which suggests that bank acquirers with higher levels of risk need more time in order to complete the deals. On the other hand, the price-to-book ratio is significant and negatively associated with the time to completion and therefore acquirers with higher levels of price-to-book ratios tend to complete faster the announced M&As.

Considering the deal-specific variables, the results show that relative deal size is significant and positively associated with the time to completion and therefore deals with larger size need more time in order to be completed. Furthermore, the selection of stock as method of payment is significant and positively associated with the time to completion suggesting that it takes more time to acquirers in order to complete stock-only financed bank M&As.

Industry focused deals are also significant and positively associated with the time to completion suggesting that bank M&As in which the participants have the two-digit SIC code are associated with longer time to completion. The selection of listed targets constitutes a factor that also affects the time to completion and specifically the acquisition of listed targets is significantly positively associated with the time to completion. Finally, in four out of thirteen regression models, the coefficient of the intrastate dummy is positive and significant (at 10%), suggesting a positive relationship between the intrastate deals and the time to completion.

Chapter 7: Robustness checks for the effect of EPU on Shareholder Wealth

The main argument of the results presented in the previous chapter is that policy-related economic uncertainty has a positive and significant impact on the short-run performance of bank M&As, suggesting that acquiring banks gain higher returns upon M&A announcements amid period of high policy uncertainty. In Chapter 7, several robustness tests are applied in order to enhance the validity of the main result that economic policy uncertainty positively affects the performance upon bank M&As. The usage of alternative asset pricing models over various event windows, the estimation whether the impact of EPU holds on the long-run, and the implementation of methodologies to address endogeneity concerns are presented in order to assess the sensitivity of the results.

7.1. The effect of EPU on acquirer's CARs using alternative asset pricing models and various event-windows

Table 41 presents the results of cross-sectional analysis using alternative proxies for the dependent variables. Acquirer's cumulative abnormal returns (CARs) are estimated using alternative asset pricing models and across various event windows. In particular, the seven-day event window (-3, 3), the five-day event window (-2, 2), the three-day event window (0,2) and the two-day event window (0,1) are used to measure the valuation effects surrounding the M&A announcements. With respect to the alternative asset pricing models, in Panel A the CARs are estimated with the market model, in Panel B the CARs are estimated with the four-factor model and in Panel C the CARs are estimated using the market-adjusted model.

According to the results presented in Table 41, irrespectively of both the selection of asset pricing model and the selection of the event-window, policy-related economic uncertainty has a positive and significant impact on the acquirer's CARs. Specifically, across four alternative event windows, results derived from the market model (Panel A) show that the coefficient of the overall BBD index is positive and significant at the 1% level. Economically, in the five-day event window (-2, 2) the results suggest that a one standard deviation increase in the level of EPU is associated with an about 24.6bps increase in five-day CARs upon the announcement of bank M&As. Using the four-factor model (Panel B), the results confirm that policy-related economic uncertainty significantly positively affect the shareholder value upon M&A announcements. The coefficient of EPU varies from 0.009 to 0.010 with respect to the selection of the event-window. The results from the market-adjusted model (Panel C) further confirm that the policy uncertainty has a positive and significant (at the 1% level) impact on the acquirer's CARs. In particular, across the five-day event window (-2, 2) the coefficient is 0.014 suggesting that one standard deviation increase in EPU increases by about 34.4bps the five-day acquirer's CARs.

Table 41. The effect of Economic Policy Uncertainty (EPU) on acquirer's announcement CARs: A cross-sectional analysis using alternative asset pricing models across various event windows

	Panel A: Market model				Panel B: Four-factor model				Panel C: Market-adjusted model			
	$CAR_{i(-3,3)}$	$CAR_{i(-2,2)}$	$CAR_{i(0,2)}$	$CAR_{i(0,1)}$	$CAR_{i(-3,3)}$	$CAR_{i(-2,2)}$	$CAR_{i(0,2)}$	$CAR_{i(0,1)}$	$CAR_{i(-3,3)}$	$CAR_{i(-2,2)}$	$CAR_{i(0,2)}$	$CAR_{i(0,1)}$
EPU	0.010[a]	0.010[a]	0.009[a]	0.008[a]	0.010[a]	0.009[b]	0.009[a]	0.009[a]	0.015[a]	0.014[a]	0.011[a]	0.010[a]
	[0.0039]	[0.0035]	[0.0033]	[0.0030]	[0.0039]	[0.0035]	[0.0032]	[0.0029]	[0.0040]	[0.0036]	[0.0033]	[0.0030]
	(2.63)	(2.73)	(2.79)	(2.83)	(2.63)	(2.55)	(2.84)	(2.98)	(3.73)	(3.73)	(3.43)	(3.42)
Total Assets	-0.001	-0.001	-0.001	-0.001	-0.002	-0.002[c]	-0.001	-0.001	-0.002[b]	-0.002[b]	-0.001	-0.001
	[0.0010]	[0.0009]	[0.0008]	[0.0007]	[0.0010]	[0.0009]	[0.0008]	[0.0007]	[0.0010]	[0.0009]	[0.0008]	[0.0007]
	(-1.54)	(-1.48)	(-0.71)	(-0.86)	(-1.63)	(-1.74)	(-0.96)	(-1.28)	(-1.98)	(-2.04)	(-0.95)	(-1.09)
AGE	-0.002	-0.002	-0.003[a]	-0.003[a]	-0.001	-0.002	-0.003[a]	-0.003[a]	-0.002	-0.002	-0.003[a]	-0.003[a]
	[0.0014]	[0.0013]	[0.0012]	[0.0010]	[0.0014]	[0.0013]	[0.0012]	[0.0010]	[0.0015]	[0.0013]	[0.0012]	[0.0010]
	(-1.18)	(-1.53)	(-2.71)	(-3.42)	(-0.93)	(-1.47)	(-2.80)	(-3.47)	(-1.17)	(-1.64)	(-2.61)	(-3.31)
Return on Assets	0.000	0.001	0.001	0.003	-0.001	0.000	0.001	0.003	0.000	0.001	0.001	0.003
	[0.0034]	[0.0030]	[0.0028]	[0.0025]	[0.0034]	[0.0030]	[0.0027]	[0.0025]	[0.0034]	[0.0031]	[0.0028]	[0.0025]
	(-0.03)	(0.42)	(0.43)	(1.07)	(-0.25)	(0.13)	(0.35)	(1.14)	(-0.02)	(0.40)	(0.50)	(1.20)
Reserve for Loan Losses % Total Loans	0.000	0.000	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.002	0.001
	[0.0013]	[0.0011]	[0.0010]	[0.0010]	[0.0013]	[0.0011]	[0.0010]	[0.0010]	[0.0013]	[0.0011]	[0.0010]	[0.0010]
	(0.13)	(0.33)	(1.19)	(1.26)	(-0.08)	(0.53)	(0.97)	(1.05)	(0.78)	(0.88)	(1.44)	(1.24)
Total Debt % Common Equity	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]
	(0.61)	(-0.56)	(-0.29)	(0.29)	(0.33)	(-0.56)	(-0.44)	(0.16)	(0.89)	(-0.47)	(-0.35)	(0.28)
Total Loans % Total Assets	0.000	0.000	0.000	0.000	0.000	0.000	0.000[c]	0.000[c]	0.000	0.000	0.000	0.000
	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]
	(1.36)	(1.07)	(1.55)	(1.54)	(1.51)	(1.29)	(1.67)	(1.65)	(1.48)	(1.04)	(1.36)	(1.18)
Price-to-Book	-0.005[a]	-0.004[a]	-0.002	-0.002	-0.005[a]	-0.004[a]	-0.003[b]	-0.002	-0.003[c]	-0.003[c]	-0.002	-0.001
	[0.0016]	[0.0014]	[0.0015]	[0.0015]	[0.0016]	[0.0014]	[0.0015]	[0.0014]	[0.0016]	[0.0014]	[0.0015]	[0.0014]
	(-2.87)	(-2.70)	(-1.63)	(-1.31)	(-3.14)	(-3.10)	(-2.02)	(-1.60)	(-1.88)	(-1.83)	(-1.04)	(-0.86)
Relative Deal Size	-0.013[b]	-0.013[b]	-0.015[a]	-0.013[a]	-0.015[b]	-0.015[a]	-0.017[a]	-0.015[a]	-0.016[a]	-0.014[b]	-0.015[a]	-0.014[a]
	[0.0060]	[0.0055]	[0.0055]	[0.0049]	[0.0059]	[0.0055]	[0.0055]	[0.0048]	[0.0060]	[0.0057]	[0.0056]	[0.0049]
	(-2.16)	(-2.43)	(-2.79)	(-2.64)	(-2.57)	(-2.67)	(-3.15)	(-3.13)	(-2.65)	(-2.46)	(-2.77)	(-2.83)

Stock-only financed deals	-0.003 [0.0019] (-1.39)	-0.001 [0.0017] (-0.80)	-0.003[c] [0.0016] (-1.77)	-0.002 [0.0014] (-1.25)	-0.001 [0.0019] (-0.56)	0.000 [0.0017] (-0.09)	-0.002 [0.0016] (-1.01)	-0.001 [0.0014] (-0.80)	-0.002 [0.0020] (-0.91)	-0.001 [0.0018] (-0.50)	-0.003[c] [0.0016] (-1.88)	-0.002 [0.0015] (-1.36)
Intrastate deals	0.002 [0.0020] (1.07)	0.002 [0.0018] (1.14)	0.002 [0.0017] (1.02)	0.000 [0.0015] (-0.08)	0.003 [0.0020] (1.30)	0.002 [0.0018] (1.16)	0.001 [0.0016] (0.71)	0.000 [0.0015] (-0.32)	0.003 [0.0021] (1.37)	0.002 [0.0019] (1.28)	0.002 [0.0017] (1.30)	0.000 [0.0015] (0.21)
Industry focused deals	0.001 [0.0025] (0.45)	0.001 [0.0023] (0.25)	0.001 [0.0021] (0.28)	0.000 [0.0018] (0.02)	0.001 [0.0025] (0.47)	0.000 [0.0023] (0.10)	0.000 [0.0021] (0.20)	0.000 [0.0018] (0.03)	0.001 [0.0026] (0.30)	0.000 [0.0024] (-0.01)	0.000 [0.0021] (0.13)	0.000 [0.0018] (0.18)
Public Targets	-0.011[a] [0.0020] (-5.78)	-0.011[a] [0.0018] (-5.97)	-0.011[a] [0.0016] (-6.95)	-0.011[a] [0.0015] (-7.37)	-0.011[a] [0.0019] (-5.82)	-0.010[a] [0.0017] (-6.02)	-0.011[a] [0.0016] (-6.83)	-0.010[a] [0.0014] (-7.05)	-0.011[a] [0.0020] (-5.44)	-0.011[a] [0.0018] (-5.85)	-0.011[a] [0.0017] (-6.86)	-0.011[a] [0.0015] (-7.17)
Constant	0.003 [0.0268] (0.10)	0.006 [0.0243] (0.24)	-0.003 [0.0227] (-0.15)	0.000 [0.0208] (-0.01)	0.001 [0.0266] (0.05)	0.012 [0.0243] (0.49)	0.001 [0.0226] (0.03)	0.004 [0.0204] (0.19)	-0.011 [0.0277] (-0.41)	0.001 [0.0250] (0.03)	-0.010 [0.0232] (-0.43)	-0.005 [0.0209] (-0.22)
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2759	2759	2759	2759	2759	2759	2759	2759	2759	2759	2759	2759
R^2	0.0840	0.0809	0.0850	0.0832	0.0838	0.0838	0.0888	0.0878	0.0840	0.0819	0.0843	0.0839
VIF	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63

Note: This table reports the results derived from OLS regression models for the impact of Economic Policy Uncertainty (EPU) on the value creation upon bank M&A announcements. The dependent variable is the acquirer announcement Cumulative Abnormal Returns (CARs). In Panel A CARs are estimated with the market model using the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark, In Panel B CARs are estimate with the Carhart four-factor model, while in Panel C CARs are estimated with the market-adjusted model using the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark. To further verify the robustness of the results, CARs are estimate across alternative event windows surrounding the deal announcements. Specifically, the seven-day (-3, 3), the five-day (-2,2), the three-day (0,2) and the two-day (0,1) event windows are used to measure the value creation from bank M&As. EPU is estimated by the natural logarithm of the three-month weighted mean BBD overall index for the year preceding the bank M&A announcements. The control variables that are used in the cross-sectional analysis include both bank-specific and deal-specific characteristics and are described in the Table 3. State-fixed effects are also included in the regression models. The coefficients derived from the regression analysis are reported in the first line of each independent variable. Standard errors are clustered using the two-way clustered method both at bank and at year level and are presented in brackets, whereas *t*-values estimated using the double-clustering method are reported in parentheses. All variables are winsorized at the 1% and the 99% levels. The superscripts a, b and c denote significance at 1%, 5%, and 10% levels, respectively.

Overall, the results in this section confirm again that BBD overall uncertainty positively affects the value creation upon bank M&As and therefore bank M&As that are announced during periods of high policy uncertainty are associated with higher acquirer's returns.

7.2. The effect of EPU on the long-run performance of bank M&As using acquirer's BHARs

To further analyze the impact of policy-related economic uncertainty on the performance of bank M&As, the long-run performance measured by Buy-and-Hold Abnormal Returns (BHARs) is used as dependent variable in the cross-sectional analysis. Table 42 presents the results for different time periods.

Table 42. The effect of Economic Policy Uncertainty (EPU) on the acquirer's long-run performance upon bank M&As

	BHARs for 1-year period (1)	BHARs for 2-year period (2)	BHARs for 3-year period (3)
EPU	0.003 [0.0246] (0.13)	0.136[a] [0.0413] (3.30)	0.146[a] [0.0549] (2.66)
Total Assets	-0.015[b] [0.0060] (-2.50)	-0.024[b] [0.0112] (-2.15)	-0.054[a] [0.0158] (-3.44)
AGE	-0.002 [0.0095] (-0.20)	-0.015 [0.0180] (-0.85)	-0.017 [0.0250] (-0.67)
Return on Assets	0.073[a] [0.0198] (3.71)	0.107[a] [0.0376] (2.85)	0.046 [0.0528] (0.88)
Reserve for Loan Losses % Total Loans	0.027[a] [0.0090] (3.03)	0.045[a] [0.0157] (2.87)	0.110[a] [0.0237] (4.65)
Total Debt % Common Equity	0.000[b] [0.0001] (2.57)	0.000 [0.0001] (0.98)	0.000 [0.0002] (0.56)
Total Loans % Total Assets	-0.001[c] [0.0007] (-1.75)	-0.003[b] [0.0012] (-2.54)	-0.005[a] [0.0017] (-2.80)
Price-to-Book	-0.058[a] [0.0101] (-5.76)	-0.050[b] [0.0196] (-2.54)	0.006 [0.0240] (0.25)
Relative Deal Size	-0.006 [0.0308] (-0.21)	0.007 [0.0599] (0.12)	0.007 [0.0788] (0.09)
Stock-only financed deals	-0.031[b] [0.0120] (-2.59)	-0.031 [0.0208] (-1.49)	0.021 [0.0283] (0.74)
Intrastate deals	0.017 [0.0130] (1.30)	0.015 [0.0221] (0.67)	0.002 [0.0299] (0.08)

Industry focused deals	0.019 [0.0168] (1.10)	-0.023 [0.0277] (-0.83)	-0.050 [0.0370] (-1.34)
Public Targets	0.032[b] [0.0126] (2.58)	0.050[b] [0.0218] (2.29)	0.045 [0.0288] (1.58)
Constant	0.311[c] [0.1699] (1.83)	0.052 [0.3119] (0.17)	0.718[c] [0.4157] (1.73)
State Fixed Effects	Yes	Yes	Yes
N	2642	2181	2181
R^2	0.0639	0.0784	0.0949
Mean VIF	1.62	1.56	1.56

Note: This table presents the results derived from a cross-sectional OLS regression for the impact of Economic Policy Uncertainty (EPU) on acquirer Buy-and-Hold Abnormal Returns (BHARs). BHARs are estimated using the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark across three different holding periods (i.e. 12-month, 24-month, and 36-month period) beginning after the bank M&A completion date (effective date). EPU is estimated by the natural logarithm of the three-month weighted mean BBD overall index for the year preceding the bank M&A announcements. The control variables that are used in the cross-sectional analysis include both bank-specific and deal-specific characteristics and are described in the Table 3. State-fixed effects are also included in the regression models. The coefficients derived from the regression analysis are reported in the first line of each independent variable. Standard errors are clustered using the two-way clustered method both at bank and at year level and are presented in brackets, whereas *t*-values estimated using the double-clustering method are reported in parentheses. All variables are winsorized at the 1% and the 99% levels. The superscripts a, b and c denote significance at 1%, 5%, and 10% levels, respectively.

According to the results in table 42, BBD policy uncertainty has a positive and significant (at the 1% level) impact on acquirer's BHARs over both a two-year and a three-year holding period after the M&A completion date. However, there is an insignificant impact of EPU on BHARs over the one-year holding period. The results further demonstrate that bank's total assets, total loans to total assets, and Price to Book ratio are significantly negatively associated with long-run M&A performance, while both ROA and Reserves for loan losses to total loans have positive impact on acquirer's BHARs. With respect to the deal-specific variables, a remarkable result is that although acquisition of public targets has a robust negative impact on acquirer's announcement CARs, it has a positive impact both on the one-year and on the two-year BHARs after the completion of M&As. Therefore, even though there is a negative association between acquisition of public targets and acquirers' CARs, which is also supported by previous studies, this association alters when the performance is measured by BHARs. In particular, the results showed that the acquisition of public targets has a positive or an insignificant impact on acquirers' long-run returns. This finding is consistent with the notion of Antoniou et al. (2007) who argued that regardless of the target listed status, acquirers experienced losses in long-run, and found that the gains in short-run upon the acquisition of private or subsidiary targets did non persist in the long-run.

7.3. The impact of Economic Policy Uncertainty on acquirer's CARs using Propensity Score Matching (PSM)

In accordance with prior research in the field of finance (Behr and Heid, 2011; Y.-S. Huang et al., 2022; Hussain and Shams, 2022; Nnadi et al., 2021; Subrahmanyam et al., 2014), to alleviate concerns for potential self-selection bias, the technique of Propensity Score Matching (PSM) is applied. PSM constitutes a method that can be used in order to correct sample selection bias coming from observable differences between the treatment group and the control group (Dehejia and Wahba, 2002; Heckman et al., 1997). Therefore, this method can be used in order to create comparable sub-samples of deals with respect to the level of policy uncertainty upon the announcement of M&As.

In line with prior studies that employed the PSM method (Alexandridis et al., 2017; Dang et al., 2021; Hossain et al., 2021; Leledakis and Pyrgiotakis, 2019; Shams et al., 2022), the whole sample is separated into two sub-samples with respect to the level of uncertainty and therefore bank M&As are classified into those that are announced over high-level (above the median) or over low-level (below the median) policy uncertainty periods. In particular, the dummy variable "low uncertainty" takes the value of one for bank M&As that are announced during periods of low uncertainty and zero otherwise. Bank M&As that are announced during periods of low uncertainty are classified into the treatment group while those M&As that are announced during periods of high uncertainty constitute the control group.

Matching is the process of sampling in order to create a control group in which the covariates have similar distribution to the distribution of the covariates in the treated group (Rosenbaum and Rubin, 1983). In this context, the purpose of PSM is to match bank M&As between the two sub-samples (low-uncertainty and high-uncertainty) in order to have similar firm-specific and deal-specific characteristics. The matching is achieved using propensity scores that derived from a discrete choice model that is used to estimate the propensity of M&A announcements during periods of low uncertainty. In this step of PSM analysis, a Logit model is employed (Dang et al., 2021; Li and Zhao, 2006; Nguyen and Vu, 2021; Wang et al., 2021).

Furthermore, the presented matching strategy allows replacement (PSM with replacement) which implies that each treatment unit can be matched with the unit of the control group even if the control unit must be matched more times (Barbopoulos and Adra, 2016; Dehejia and Wahba, 2002; Ji et al., 2021). In line with prior studies (Barbopoulos and Adra, 2016; Mavis et al., 2020; Mendes et al., 2022; Nnadi et al., 2021; Schweizer et al., 2019; Wang et al., 2021), the nearest-neighbor (matching one to one) procedure is applied. To employ the PSM method, in the first step propensity score is estimated via a logit model using the dummy variable "low uncertainty" as the dependent variable. To estimate the propensity scores, the likelihood of deal

announcements during period of Low EPU is investigated using the Logit model as shown in Eq. 24.

$$Low\ EPU = a + \sum_{j=1}^{k} \lambda_j X_{ij} + \varepsilon_i \qquad i = 1 \ldots N \qquad (24)$$

Where, Low EPU is a dummy variable that equals the value of one when the three-month weighted mean BBD overall index is below its median over the entire period 1986-2020, and zero otherwise. a is the constant term of the Logit model, X_{ij} is a vector of k control variables that are applied in order to estimate the propensity of M&A announcements during low-uncertainty, λ_j is the k coefficients which capture the impact of the control variables on binary "Low Uncertainty", and ε_i is the error term. Results derived from the PSM analysis are presented in the table 43. Panel A presents the results of the Logit model, whereas Panels B to G present the Average Treatment Effect on Treated (ATTs) and indicate the differences in acquirer's CARs between the treatment and the control group. The standard errors for ATTs are estimated using the method of Abadie and Imbens (2006)[28].

Table 43. Propensity Score Matching (PSM) analysis for acquirer's CARs with respect to the level of Economic Policy Uncertainty

Panel A: Logit estimation results (Low Policy Uncertainty =1)	
Total Assets	-0.122[a] [0.0409] (-2.98)
AGE	-0.236[a] [0.0612] (-3.85)
Return on Assets	0.321[b] [0.1328] (2.41)
Reserve for Loan Losses % Total Loans	0.010 [0.0617] (0.17)
Total Debt % Common Equity	0.001[a] [0.0004] (3.09)
Total Loans % Total Assets	0.008[c] [0.0046] (1.73)
Price-to-Book	1.171[a] [0.0885] (13.23)
Relative Deal Size	0.467[b] [0.2089] (2.23)
Stock-only financed deals	0.147 [0.0895] (1.65)

[28] To perform the PSM analysis, the PSMATCH2 stata module by Leuven and Sianesi (2018) is applied.

Intrastate deals	-0.076 [0.0971] (-0.78)
Industry focused deals	-0.442[a] [0.1190] (-3.71)
Public Targets	0.194[b] [0.0951] (2.04)
Constant	2.109[b] [0.8905] (2.37)
N	2744
LR Chi^2	448.06[a]
Pseudo R^2	0.1196
Panel B: ATTs for $CAR_{i(-1,1)}$ calculated with the market adjusted model	
Treated - M&A during periods of low policy uncertainty	-0.00757
Control - M&A during periods of high policy uncertainty	0.00006
Difference	-0.00763[a]
Panel C: ATTs for $CAR_{i(-2,2)}$ calculated with the market adjusted model	
Treated - M&A during periods of low policy uncertainty	-0.00697
Control - M&A during periods of high policy uncertainty	0.00591
Difference	-0.01287[a]
Panel D: ATTs for $CAR_{i(-1,1)}$ calculated with the market model	
Treated - M&A during periods of low policy uncertainty	-0.00676
Control - M&A during periods of high policy uncertainty	0.00255
Difference	-0.00931[a]
Panel E: ATTs for $CAR_{i(-2,2)}$ calculated with the market model	
Treated - M&A during periods of low policy uncertainty	-0.00744
Control - M&A during periods of high policy uncertainty	-0.00186
Difference	-0.00559[b]
Panel F: ATTs for $CAR_{i(-1,1)}$ calculated with the four-factor model	
Treated - M&A during periods of low policy uncertainty	-0.00798
Control - M&A during periods of high policy uncertainty	-0.00242
Difference	-0.00557[b]
Panel G: ATTs for $CAR_{i(-2,2)}$ calculated with the four-factor model	
Treated - M&A during periods of low policy uncertainty	-0.00740
Control - M&A during periods of high policy uncertainty	0.00135
Difference	-0.00874[a]

Note: This table presents the results derived from the Propensity Score Matching (PSM) analysis. Panel A reports the results from a Logit model that is used to estimate the propensity scores. The dummy low uncertainty is used as dependent variable in the Logit model. Low uncertainty exists when EPU is below the median BBD index over the entire sample period while high EPU exists when EPU equals or is above the mean BBD index. The treated group includes bank M&As that are announced during periods of low uncertainty whereas the control group includes bank M&As that are announced during periods of high uncertainty. Panels B to G report the average treatment effect on the treated (ATT) using CARs that are estimated with alternative asset pricing models. In particular, in Panels B and C the CARs are estimated using the market-adjusted model, in Panels D and E the CARs are estimated using the market model, and in Panels F and G the CARs are estimated using the Carhart four-factor model. Two alternative event windows (i.e. the three-day (-1,1) event window and the five-day (-2,2) event window) are used to estimate the CARs. The PSM analysis is conducted using the nearest neighbor approach (matching one to one). The heteroskedasticity-consistent standard errors for ATTs are estimated using the method of Abadie and Imbens (2006). All variables are winsorized at the 1% and 99% levels. The subscripts a, b and c denote significance at 1%, 5% and 10% levels, respectively.

Panel A of Table 43 reports the results of the logit model that estimates the probability of bank M&A announcements during periods of low uncertainty. According to the results, the bank size, measured by the total assets, has a negative and significant (at the 1% level) impact on the probability of M&A announcements during periods of low uncertainty. Therefore, the larger the acquirer is the less probable is to announce M&As during periods of low uncertainty. The same pattern is presented for the AGE given that acquirer's AGE is significantly negatively associated with the bank M&A announcements during periods of low uncertainty. On the other hand, the ROA has a positive and significant impact on the low uncertainty dummy suggesting that acquirers with higher ROA tend to announce bank M&As during periods of low uncertainty. The same pattern holds for acquirers with high total debt to common equity ratio, high total loans to total assets ratio and high price to book ratio given that the aforementioned variables have a significant and positive impact on the low uncertainty dummy. Considering the deal-specific variables, both M&As with large deal size and M&As which referred to the acquisition of public targets tend to be announced during periods of low uncertainty whereas industry focused deals are significant and negatively associated with the low uncertainty dummy. Panels B to G in Table 43 report the results for the average treatment effect on treated (ATTs) for CARs that are estimated using alternative asset pricing models over various event windows. For the three-day acquirer's CARs estimated with the market-adjusted model, the results support that acquirer's CARs for bank M&As during low uncertainty period are significantly lower (by about 0.763%) compared to M&As from the control group. Overall, even after addressing self-selection bias due to differences in the bank-specific and deal-specific characteristics between high policy uncertainty periods and low uncertainty periods, bank M&As that are announced during periods of high uncertainty are associated with significantly higher CARs for acquirers.

7.4. The impact of Economic Policy Uncertainty on acquirer's CARs using Entropy Balancing Technique (EBT)

As an alternative method to address concerns for self-selection bias, the Entropy Balancing Technique (EBT) is also used to analyze the impact of policy uncertainty on the acquirer's CARs. EBT is used in observational studies with binary treatments in order to create balanced samples via the application of reweighted techniques[29]. EBT proposed by Hainmueller (2012) is a processing method that is applied to achieve an exact matching between the treatment group and the control group, given the known moment constraints of the covariate distributions.

Contemporary studies (Albareto et al., 2022; Al-Hadi et al., 2022; Ambrocio et al., 2022; Boasiako et al., 2022; Boubaker et al., 2022; Chahine et al., 2021, 2020; Chen et al., 2022; Hasan and Alam, 2022; Hasan and Uddin, 2022; C.-W. Huang et al.,

[29] For more details about the theoretical properties and the advantages of EBT see Hainmueller, (2012).

2022; Nguyen and Shi, 2021; Wu et al., 2022) applied the method of entropy balancing in order to alleviate self-selection bias/ omitted variable/ endogeneity concerns. The treated group is consisted of bank M&As that are announced during periods of low uncertainty (low uncertainty dummy=1) whereas the control group is consisted of bank M&As that are announced during periods of low uncertainty (low uncertainty dummy=0). The entropy balancing reweights the sample in order to achieve identical properties (mean, standard deviation) across all the covariates. In particular, the covariates include all the bank-specific and the deal-specific variables that are used in the multivariate analysis. Table 44 presents the results of the entropy balancing technique (EBT)[30].

[30] To perform the EBT analysis, the *ebalance* stata package for Entropy Balancing by Hainmueller and Xu (2013) is used.

Table 44. The effect of Economic Policy Uncertainty (EPU) on the acquirer's CARs using the Entropy Balancing Technique (EBT)

Panel A: Differences in covariates before and after entropy balancing

	Before entropy balancing					After entropy balancing				
	Treat group (Low Policy Uncertainty =1)		Control group			Treat group (Low Policy Uncertainty =1)		Control Group		
	Mean	Var	Mean	Var	Std.Dif. of mean	Mean	Var	Mean	Var	Std.Dif. of mean
Total Assets	22.010	2.641	22.160	2.062	-0.091	22.010	2.641	22.010	2.007	0.000
AGE	8.227	0.922	8.352	0.645	-0.131	8.227	0.922	8.227	0.738	0.000
Return on Assets	1.033	0.144	0.919	0.165	0.301	1.033	0.144	1.033	0.178	0.000
Reserve for Loan Losses % Total Loans	1.436	0.516	1.507	0.568	-0.099	1.436	0.516	1.436	0.421	0.000
Total Debt % Common Equity	164.70	20393.00	152.20	18515.00	0.088	164.70	20393.00	164.70	19706.00	0.000
Total Loans % Total Assets	65.340	105.100	64.540	101.700	0.078	65.340	105.100	65.340	99.740	0.000
Price-to-Book	1.914	0.722	1.459	0.304	0.536	1.914	0.722	1.914	0.680	0.000
Relative Deal Size	0.195	0.057	0.179	0.049	0.067	0.195	0.057	0.195	0.062	0.000
Stock-only financed deals	0.462	0.249	0.395	0.239	0.134	0.462	0.249	0.462	0.249	0.000
Intrastate deals	0.555	0.247	0.560	0.247	-0.010	0.555	0.247	0.555	0.247	0.000
Industry focused deals	0.806	0.156	0.860	0.121	-0.136	0.806	0.156	0.806	0.156	0.000
Public Targets	0.524	0.250	0.490	0.250	0.069	0.524	0.250	0.524	0.250	0.000

Panel B: Entropy balancing weighted regressions: The effect of EPU on acquirer's announcement CARs

	Market-adjusted model				Market model				Four-factor model			
	$CAR_{i(-1,1)}$	$CAR_{i(-1,1)}$	$CAR_{i(-2,2)}$	$CAR_{i(-2,2)}$	$CAR_{i(-1,1)}$	$CAR_{i(-1,1)}$	$CAR_{i(-2,2)}$	$CAR_{i(-2,2)}$	$CAR_{i(-1,1)}$	$CAR_{i(-1,1)}$	$CAR_{i(-2,2)}$	$CAR_{i(-2,2)}$
EPU		0.013[a] [0.0036] (3.60)		0.018[a] [0.0041] (4.46)		0.011[a] [0.0035] (3.06)		0.013[a] [0.0041] (3.27)		0.010[a] [0.0033] (3.11)		0.013[a] [0.0041] (3.27)
Low EPU dummy	-0.007[a] [0.0018] (-3.75)		-0.009[a] [0.0021] (-4.13)		-0.005[a] [0.0017] (-2.99)		-0.006[a] [0.0021] (-2.77)		-0.005[a] [0.0016] (-3.08)		-0.005[a] [0.0020] (-2.62)	
Total Assets	-0.002[c] [0.0009] (-1.77)	-0.002[c] [0.0010] (-1.85)	-0.002 [0.0010] (-1.58)	-0.002[c] [0.0010] (-1.71)	-0.001 [0.0009] (-1.34)	-0.001 [0.0009] (-1.41)	-0.001 [0.0010] (-1.18)	-0.001 [0.0010] (-1.27)	-0.002[c] [0.0009] (-1.79)	-0.002[c] [0.0009] (-1.86)	-0.001 [0.0010] (-1.31)	-0.001 [0.0010] (-1.27)
AGE	-0.003[b] [0.0011] (-2.42)	-0.003[a] [0.0011] (-2.61)	-0.003[b] [0.0015] (-2.20)	-0.003[b] [0.0015] (-2.39)	-0.003[b] [0.0011] (-2.46)	-0.003[a] [0.0011] (-2.63)	-0.003[b] [0.0014] (-2.06)	-0.003[b] [0.0014] (-2.21)	-0.003[b] [0.0011] (-2.41)	-0.003[b] [0.0011] (-2.58)	-0.003[c] [0.0014] (-1.95)	-0.003[b] [0.0014] (-2.21)
Return on Assets	-0.001 [0.0032] (-0.19)	0.000 [0.0032] (-0.06)	-0.004 [0.0037] (-0.98)	-0.003 [0.0037] (-0.81)	-0.001 [0.0032] (-0.25)	0.000 [0.0031] (-0.14)	-0.004 [0.0037] (-0.98)	-0.003 [0.0037] (-0.86)	0.000 [0.0030] (0.00)	0.000 [0.0030] (0.12)	-0.004 [0.0035] (-1.13)	-0.003 [0.0037] (-0.86)

Reserve for Loan Losses % Total Loans	0.001 [0.0012] (0.80)	0.001 [0.0012] (0.87)	0.000 [0.0014] (-0.36)	0.000 [0.0013] (-0.27)	0.001 [0.0013] (0.47)	0.001 [0.0013] (0.53)	-0.001 [0.0014] (-0.54)	-0.001 [0.0014] (-0.48)	0.001 [0.0012] (0.59)	0.001 [0.0012] (0.65)	-0.001 [0.0014] (-0.43)	-0.001 [0.0014] (-0.48)
Total Debt % Common Equity	0.000 [0.0000] (1.20)	0.000 [0.0000] (1.47)	0.000 [0.0000] (0.09)	0.000 [0.0000] (0.39)	0.000 [0.0000] (0.95)	0.000 [0.0000] (1.17)	0.000 [0.0000] (-0.18)	0.000 [0.0000] (0.03)	0.000 [0.0000] (0.97)	0.000 [0.0000] (1.18)	0.000 [0.0000] (-0.13)	0.000 [0.0000] (0.03)
Total Loans % Total Assets	0.000[b] [0.0001] (2.29)	0.000[b] [0.0001] (2.28)	0.000[c] [0.0001] (1.77)	0.000[c] [0.0001] (1.77)	0.000[c] [0.0001] (1.90)	0.000[c] [0.0001] (1.90)	0.000[c] [0.0001] (1.67)	0.000[c] [0.0001] (1.68)	0.000[b] [0.0001] (2.31)	0.000[b] [0.0001] (2.31)	0.000[c] [0.0001] (1.90)	0.000[c] [0.0001] (1.68)
Price-to-Book	0.001 [0.0016] (0.60)	0.001 [0.0016] (0.66)	0.001 [0.0020] (0.72)	0.002 [0.0020] (0.80)	0.000 [0.0016] (0.26)	0.001 [0.0016] (0.32)	0.000 [0.0020] (0.14)	0.000 [0.0020] (0.21)	0.000 [0.0014] (-0.30)	0.000 [0.0015] (-0.23)	-0.001 [0.0019] (-0.34)	0.000 [0.0020] (0.21)
Relative Deal Size	-0.009 [0.0063] (-1.42)	-0.009 [0.0063] (-1.48)	-0.011 [0.0079] (-1.43)	-0.012 [0.0079] (-1.50)	-0.008 [0.0061] (-1.32)	-0.008 [0.0061] (-1.37)	-0.010 [0.0077] (-1.29)	-0.010 [0.0077] (-1.34)	-0.009 [0.0060] (-1.53)	-0.009 [0.0060] (-1.58)	-0.012 [0.0076] (-1.56)	-0.010 [0.0077] (-1.34)
Stock-only financed deals	0.000 [0.0019] (-0.03)	0.000 [0.0020] (0.10)	0.001 [0.0023] (0.35)	0.001 [0.0023] (0.49)	-0.001 [0.0018] (-0.30)	0.000 [0.0019] (-0.19)	0.000 [0.0022] (0.14)	0.001 [0.0022] (0.25)	0.000 [0.0017] (0.12)	0.000 [0.0018] (0.23)	0.002 [0.0021] (0.78)	0.001 [0.0022] (0.25)
Intrastate deals	0.000 [0.0021] (-0.23)	0.000 [0.0022] (-0.21)	0.004[c] [0.0023] (1.83)	0.004[c] [0.0023] (1.85)	0.000 [0.0021] (-0.09)	0.000 [0.0021] (-0.07)	0.004[c] [0.0022] (1.75)	0.004[c] [0.0022] (1.77)	0.000 [0.0019] (0.02)	0.000 [0.0020] (0.03)	0.005[b] [0.0021] (2.14)	0.004[c] [0.0022] (1.77)
Industry focused deals	-0.003 [0.0027] (-1.06)	-0.003 [0.0027] (-1.07)	-0.007[b] [0.0035] (-1.97)	-0.007[b] [0.0035] (-1.98)	-0.002 [0.0025] (-0.99)	-0.003 [0.0025] (-1.00)	-0.006[c] [0.0034] (-1.69)	-0.006[c] [0.0034] (-1.70)	-0.003 [0.0025] (-1.05)	-0.003 [0.0025] (-1.06)	-0.006[c] [0.0033] (-1.71)	-0.006[c] [0.0034] (-1.70)
Public Targets	-0.007[a] [0.0018] (-3.77)	-0.007[a] [0.0018] (-3.78)	-0.008[a] [0.0021] (-4.03)	-0.009[a] [0.0021] (-4.05)	-0.007[a] [0.0018] (-3.99)	-0.007[a] [0.0018] (-3.99)	-0.008[a] [0.0020] (-4.04)	-0.008[a] [0.0020] (-4.06)	-0.007[a] [0.0016] (-4.23)	-0.007[a] [0.0017] (-4.24)	-0.009[a] [0.0020] (-4.59)	-0.008[a] [0.0020] (-4.06)
Constant	0.050[b] [0.0204] (2.46)	-0.010 [0.0251] (-0.40)	0.064[a] [0.0217] (2.96)	-0.021 [0.0290] (-0.74)	0.042[b] [0.0200] (2.11)	-0.008 [0.0246] (-0.32)	0.050[b] [0.0210] (2.39)	-0.011 [0.0285] (-0.39)	0.044[b] [0.0184] (2.40)	-0.004 [0.0235] (-0.16)	0.050[b] [0.0206] (2.42)	-0.011 [0.0285] (-0.39)
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2759	2759	2759	2759	2759	2759	2759	2759	2759	2759	2759	2759
R^2	0.0855	0.0838	0.1041	0.1034	0.0818	0.0814	0.0944	0.0949	0.0896	0.0890	0.0987	0.0949

Note: This table presents the effect of Economic Policy Uncertainty (EPU) on the acquirer's Cumulative Abnormal Returns (CARs) using the Entropy Balancing Technique (EBT). Panel A reports the reweighted sample statistics between the treated and the control groups after the implementation of the EBT. Bank M&As that are announced during low uncertainty periods are considered as treated group, whereas bank M&As that are announced during high uncertainty periods are considered as control group. Panel B presents the results of entropy balancing weighted regressions. The dependent variable is the acquirer announcement CARs. CARs are estimated using the market-adjusted model, the market model and the Carhart four-factor model across two alternative event window (i.e. the three-day (-1, 1) event window and the five-day (-2,2) event window). EPU is estimated by the natural logarithm of the three-month weighted mean BBD overall index for the year preceding the bank M&A announcements. Low EPU dummy is assigned the value of 1 if EPU is below the median BBD index over the entire sample period and 0 otherwise. The control variables that are used in the cross-sectional analysis include both bank-specific and deal-specific characteristics and are described in the Table 3. State-fixed effects are also included in the regression models. The coefficients derived from the regression analysis are reported in the first line of each independent variable. Standard errors are presented in brackets, whereas *t*-values are reported in parentheses. All variables are winsorized at the 1% and the 99% levels. The superscripts a, b and c denote significance at 1%, 5%, and 10% levels, respectively

Panel A in table 44 reports the differences in covariates (with respect to the mean, variances and the standardized differences in means) before and after the implementation of EBT. Before the implementation of EBT, there are remarkable differences in mean between the treated (deals that are announced during low uncertainty) and the control group (deals that are announced during high uncertainty) which are minimized after the application of EBT. For example, the standardized difference of mean for the Price to Book ratio equal to 0.536 before the implementation of EBT, whereas it is equal to zero after the entropy balancing. Zero standardized differences in means are presented across all the covariates.

Panel B reports the results of weighted cross-sectional analysis that is applied after the sample balancing for the impact of policy-related economic uncertainty on the acquirer's CARs. Three alternative asset pricing models (market-adjusted model, market model, and four-factor model), as well, as two alternative event windows (two-day and five-day) surrounding the deal announcements are estimated. The impact of BBD overall index on the acquirer's CARs are evaluated using both the three-month weighted mean index (EPU) and the low EPU dummy. According to the results, low uncertainty dummy has a negative and significant (at the 1% level) impact on the acquirer's CARs. Therefore, the bank M&As announcements during periods of low uncertainty are associated with lower bidder returns, suggesting that bank M&As destroy more shareholder value over periods of low uncertainty. This result remains unaltered using alternative asset pricing models and across various event windows.

The policy-related economic uncertainty (EPU) measured by the overall BBD index has a positive and significant impact on the acquirer's CARs. Specifically, using the market-adjust model the coefficient is 0.013 and is significant at the 1% level. There is a positive association between economic policy uncertainty and the value creation from bank M&As, suggesting that wealth effects upon bank M&As are higher over periods of economic policy uncertainty. Once again, the results further confirm the positive relationship between the level of policy-related economic uncertainty and the shareholder wealth upon bank M&As.

7.5. The impact of Economic Policy Uncertainty on acquirer's CARs using Instrumental Variable (IV) Approach

Intrumental Variable (IV) approaches are widely used in order to alleviate concerns for potential endogeneity. To address concerns for endogeneity, this thesis utilizes the two-stage least square (2SLS) regression analysis. To analyze the impact of economic policy uncertainty on acquirer's CARs upon bank M&As, a proper instrument is a variable that has a significant effect on the levels of policy uncertainty but affects the acquirer's CARs only through its impact on policy-related economic uncertainty.

7.5.1. Addressing endogeneity using the Partisan Conflict Index as instrument

According to Azzimonti (2021) higher partisan conflict is associated with higher probability of crises and therefore it induces higher levels of uncertainty. Using newspaper-based data for lawmakers' disagreement about policy, Azzimonti (2018, 2014) proposed the Partisan Conflict Index (hereafter PCI) to capture the policy-related disagreement among politicians in the U.S. and found that higher PCI was significantly associated with lower levels of aggregate investments. In this context, a proper instrument for policy-related economic uncertainty is the PCI index of Azzimonti (2018). PCI is also widely used as an exogenous instrument for policy uncertainty by relevant studies (Bermpei et al., 2022; Bonaime et al., 2018; Chan et al., 2021; Dang et al., 2021; D'Mello and Toscano, 2020; Hsieh and Vu, 2021; Matousek et al., 2020; Tran et al., 2021). The instrument (PCI) is calculated as the natural logarithm of the three-month weighted mean of PCI at year prior to the deal announcement. The first stage of the employed 2SLS model is presented in Eq. 25:

$$EPU_i = a + \beta_i PCI_i + \sum_{j=1}^{n} \lambda_j X_{ij} + \varepsilon_i \qquad i = 1 \ldots N \qquad (25)$$

where EPU_i is the BBD overall index for policy-related economic uncertainty that is used in the multivariate analyses, PCI_i is the Partisan Conflict and X is a vector of n control variables that are used in the multivariate analysis. The instrumented EPU that derives from the above model (first-stage) is used for the regression analysis (second stage) in order to investigate the impact of EPU (instrumented EPU) on the acquirer's CARs upon bank M&As[31].

Table 45 reports the results of the two-stage-least square analysis using the PCI as proper instrument for policy-related economic uncertainty.

[31] To perform the IV analysis with the corresponding tests of significance, in line with prior research (Adams and Mehran, 2012; Alexakis et al., 2021; De Cesari et al., 2011; Kıvanç Karaman and Yıldırım-Karaman, 2019; Sandvik, 2020) the *ivreg2* stata module by Baum et al. (2022) is applied.

Table 45. Two-Stage Least Squares (2SLS) regression analysis using the Partisan Conflict Index (PCI) as exogenous instrument

	(1)	(2)	(3)	(4)	(5)
	First-stage	Second-stage			
	Policy Uncertainty	$CAR_{i(-1,1)}$	$CAR_{i(-2,2)}$	$CAR_{i(0,1)}$	$CAR_{i(0,2)}$
Instrumented EPU	-	0.033[a] [0.0081] (4.08)	0.041[a] [0.0094] (4.42)	0.028[a] [0.0075] (3.80)	0.039[a] [0.0087] (4.52)
Partisan Conflict Index	0.401[a] [0.0228] (17.57)				
Total Assets	0.003 [0.0046] (0.58)	-0.001[c] [0.0008] (-1.68)	-0.002[b] [0.0009] (-2.54)	-0.001 [0.0007] (-1.51)	-0.001 [0.0009] (-1.50)
AGE	0.017[a] [0.0063] (2.75)	-0.004[a] [0.0011] (-3.07)	-0.003[b] [0.0014] (-2.33)	-0.004[a] [0.0011] (-3.82)	-0.004[a] [0.0013] (-3.32)
Return on Assets	-0.041[a] [0.0157] (-2.61)	0.006[b] [0.0028] (2.22)	0.004 [0.0032] (1.09)	0.005[c] [0.0026] (1.73)	0.004 [0.0030] (1.25)
Reserve for Loan Losses % Total Loans	0.013 [0.0088] (1.52)	0.002[c] [0.0011] (1.92)	0.001 [0.0011] (1.15)	0.001 [0.0010] (1.45)	0.002[c] [0.0010] (1.74)
Total Debt % Common Equity	0.000 [0.0000] (1.04)	0.000 [0.0000] (1.59)	0.000 [0.0000] (0.47)	0.000 [0.0000] (1.03)	0.000 [0.0000] (0.67)
Total Loans % Total Assets	-0.001[b] [0.0005] (-2.38)	0.000 [0.0001] (1.46)	0.000 [0.0001] (1.21)	0.00 [0.0001] (1.32)	0.000 [0.0001] (1.55)
Price-to-Book	-0.052[a] [0.0092] (-5.68)	0.000 [0.0014] (-0.23)	0.000 [0.0016] (-0.14)	0.000 [0.0014] (0.24)	0.001 [0.0015] (0.53)
Relative Deal Size	-0.012 [0.0201] (-0.58)	-0.010[b] [0.0051] (-2.03)	-0.014[b] [0.0057] (-2.48)	-0.014[a] [0.0049] (-2.87)	-0.016[a] [0.0055] (-2.80)
Stock-only financed deals	-0.021[b] [0.0091] (-2.32)	-0.002 [0.0016] (-1.28)	0.000 [0.0018] (-0.06)	-0.001 [0.0015] (-1.01)	-0.002 [0.0016] (-1.39)
Intrastate deals	0.001 [0.0097] (0.08)	0.000 [0.0016] (0.19)	0.002 [0.0019] (1.26)	0.000 [0.0015] (0.19)	0.002 [0.0017] (1.28)
Industry focused deals	0.029[b] [0.0120] (2.45)	0.001 [0.0020] (0.25)	-0.002 [0.0024] (-0.62)	-0.001 [0.0019] (-0.34)	-0.001 [0.0022] (-0.55)
Public Targets	-0.010 [0.0094] (-1.01)	-0.010[a] [0.0016] (-6.06)	-0.010[a] [0.0018] (-5.64)	-0.010[a] [0.0015] (-7.04)	-0.011[a] [0.0017] (-6.62)

Constant	2.748[a] [0.1272] (21.60)	-0.104[a] [0.0374] (-2.78)	-0.115[a] [0.0428] (-2.69)	-0.080[b] [0.0349] (-2.30)	-0.126[a] [0.0401] (-3.14)
State Fixed Effects	Yes	Yes	Yes	Yes	Yes
F		19.81[a]	31.49[a]	29.13[a]	62.52[a]
Centered R^2	0.3002	0.0551	0.0613	0.0704	0.0598
Uncentered R^2		0.0706	0.0679	0.0863	0.0676
SW Chi-square (underid)	315.84[a]				
SW F (Weak id)	308.83				
Stock-Yogo weak ID test critical value at 10% maximum IV size	16.38				
Underidentification test					
Kleibergen-Paap rk LM statistic	231.02[a]	231.016[a]	231.016[a]	231.016[a]	231.016[a]
Weak identification tests					
Cragg-Donald Wald F statistic	503.65	503.652	503.652	503.652	503.652
Kleibergen-Paap Wald rk F statistic	308.83	308.830	308.830	308.830	308.830
Stock-Yogo weak ID test critical value at 10% maximum IV size	16.38	16.38	16.38	16.38	16.38
Anderson-Rubin Wald test F	16.39[a]				
Anderson-Rubin Wald test Chi-square	16.76[a]	-	-	-	-
N	2759	2759	2759	2759	2759

Note: This table presents the results derived from the Instrumental Variable (IV) approach using the Two-Stage-Least Square (2SLS) method. The Partisan Conflict Index (PCI) is used as an exogenous instrument for the Economic Policy Uncertainty (EPU). PCI is proposed by Azzimonti (2018) and reflects the policy-related disagreement among U.S. policy makers. PCI is measured by the natural logarithm of the three-month weighted mean PCI index for year preceding the deal announcements. EPU is estimated by the natural logarithm of the three-month weighted mean BBD overall index for the year preceding the bank M&A announcements. The results derived from the first-stage present the impact of PCI on the EPU, whereas results derived from the second-stage analyses reported the impact of the instrumented EPU on acquirer's Cumulative Abnormal Returns (CARs). CARs are estimated with the market-adjusted model using the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark across four different event windows surrounding the deal announcements. The control variables that are used in the analysis include both bank-specific and deal-specific characteristics and are described in the Table 3. State-fixed effects are also included in the models. Several statistical tests (SW F-stat, Kleinbergen-Paap rk LM statistic, Cragg-Donald Wald F, etc.) are performed to assess both the relevance and the validity of the selected instrument. The coefficients derived from the regression analysis are reported in the first row of each independent variable. Standard errors are clustered using the two-way clustered method both at bank and at year level and are presented in brackets. Both *t*-values (for the first-stage analysis) and *z*-values (for the second-stage analyses) are estimated using the double-clustering method and are reported in parentheses. All variables are winsorized at the 1% and the 99% levels. The superscripts a, b and c denote significance at 1%, 5%, and 10% levels, respectively.

The results derived from the first-stage, as shown in the Table 45, indicate that partisan conflict has a positive and significant (at the 1% level) impact on the levels of policy uncertainty, suggesting that higher levels of federal politician disagreements about policy induce higher levels of policy-related economic uncertainty. The significant impact of PCI on EPU shows that the instrument is indeed relevant. This positive association is also supported by previous studies (Azzimonti, 2021; Dang et al., 2021; D'Mello and Toscano, 2020; Matousek et al., 2020). Moreover, the results indicate that higher ROA, higher total loans to total assets, higher price to book ratios, lower acquirer's AGE, and stock-financed deals are associated with lower levels of economic policy uncertainty.

The F-statistic of the first stage has a value of 308.83 and is well above the critical value of Stock-Yogo for weak identification (Stock and Yogo, 2005a, 2005b)[32]. To further test the validity of the instrument, the Kleibergen-Paap under-identification test is also employed. The value of Kleibergen-Paap equals to 231.02 and is statistically significant at the 1% level (P-value=0.000) suggesting that the null hypothesis (H0: the model is under-identified) is rejected and therefore the PCI instrument is correlated with the endogenous variable EPU. In addition to the under-identification test, tests of weak identification are also performed. Given that both the Kleibergen-Paap Wald rk F-statistic which equals to 308.83 (Kleibergen and Paap, 2006) and the Cragg-Donald Wald F statistic which equals to 503.65 (Cragg and Donald, 1993) exceed the Stock-Yogo threshold (at 10%) of 16.38, the null hypothesis of weak identification is also rejected. The Wald test values of Anderson-Rubin (Anderson and Rubin, 1949) are also significant (at the 1% level) and further demonstrate that the selected instrument is proper. Therefore, the instrument PCI that is employed in IV analysis is relevant and strong. In addition, given that PCI affects the acquirer's CARs only through its impact on the EPU, the exogeneity condition for the instrumental variable is also supported.

The results of the second-stage show the impact of instrumented EPU on the acquirer's CARs across alternative event-windows (i.e. (-1,1), (-2,2), (0,1), and (0,2)). The instrumented EPU has a positive and significant (at the 1% level) impact on the acquirer's CARs, irrespectively of the selected event-window. The coefficient of instrument EPU varies from +0.028 for the two-day event window (0,1) to +0.041 for the five-day event window (-2,2) surrounding the deal announcements. Across the three-day event window (-1,1) the coefficient equals to +0.033 and further demonstrates that the level of policy uncertainty positively affects the acquirer's gains upon bank M&A announcements.

[32] Stock-Yogo critical value equals to 16.38 in case of 10% maximal IV size.

7.5.2. Addressing endogeneity using the Political Polarization as instrument

To further analyze the sensitivity of the results derived from the 2SLS analysis, an alternative instrument is also used. Baker et al. (2014) argue that the rise in the U.S. policy uncertainty can be explained by the level of political polarization. According to prior studies (Berger et al., 2022; Datta et al., 2019; Frye et al., 2022; Gulen and Ion, 2016; Phan et al., 2019), political polarization affects the level policy-related economic uncertainty and is used as a valid instrument for the economic policy uncertainty. Following relevant studies (Attig et al., 2021; Cheng, 2022; Gulen and Ion, 2016; Kaviani et al., 2020; Xu, 2020), the level of political polarization is measured with the dynamic weighted nominal three-step estimation (DW-NOMINATE) scores of Poole and Rosenthal (1985) and McCarty et al. (1997). The level of Political Polarization is estimated as the mean DW-NOMINATE scores for the Republican Senators minus the mean DW-NOMINATE scores for the Democratic Senators[33] (D'Mello and Toscano, 2020; Gulen and Ion, 2016). Given that Political Polarization significantly affects the policy-related economic uncertainty and also affects the acquirer's CARs only through its impact on EPU, both the relevance and the exclusion criteria are satisfied. Table 46 presents the results of the 2SLS analysis for the impact of EPU on acquirer's CARs using the Political Polarization, measured by DW-NOMINATE scores as instrument.

Table 46. Two-Stage Least Squares (2SLS) regression analysis using the Political Polarization as exogenous instrument

	(1)	(2)	(3)	(4)	(5)
	First-stage	Second-stage			
	Policy Uncertainty	$CAR_{i(-1,1)}$	$CAR_{i(-2,2)}$	$CAR_{i(0,1)}$	$CAR_{i(0,2)}$
Instrumented EPU	-	0.054[a] [0.0202] (2.67)	0.077[a] [0.0241] (3.18)	0.050[a] [0.0188] (2.66)	0.081[a] [0.0226] (3.58)
Political Polarization	0.677[a] [0.0861] (7.86)				
Total Assets	0.012[b] [0.0050] (2.44)	-0.002[c] [0.0009] (-1.94)	-0.003[a] [0.0010] (-2.86)	-0.002[c] [0.0008] (-1.82)	-0.002[b] [0.0010] (-2.05)
AGE	0.028[a] [0.0069] (4.03)	-0.004[a] [0.0014] (-3.09)	-0.005[a] [0.0017] (-2.67)	-0.005[a] [0.0013] (-3.77)	-0.006[a] [0.0016] (-3.64)
Return on Assets	-0.063[a] [0.0174] (-3.62)	0.008[b] [0.0033] (2.42)	0.006[c] [0.0039] (1.66)	0.006[b] [0.0031] (2.06)	0.007[b] [0.0037] (1.97)

[33] For more details and theoretical perspectives about the political polarization, measured by the DW-NOMINATE score, see Poole and Rosenthal (1985), McCarty et al. (1997) and Poole and Rosenthal (2017). Data are available from the Congressional Roll-Call Votes Database at: https://voteview.com/

Reserve for Loan Losses % Total Loans	0.007 [0.0095] (0.75)	0.002[b] [0.0011] (2.03)	0.002 [0.0012] (1.37)	0.002 [0.0010] (1.62)	0.002[c] [0.0012] (1.96)
Total Debt % Common Equity	0.000[a] [0.0000] (-3.72)	0.000[c] [0.0000] (1.93)	0.000 [0.0000] (1.27)	0.000 [0.0000] (1.55)	0.000[c] [0.0000] (1.66)
Total Loans % Total Assets	-0.001[b] [0.0006] (-2.37)	0.000 [0.0001] (1.55)	0.000 [0.0001] (1.36)	0.000 [0.0001] (1.44)	0.000[c] [0.0001] (1.70)
Price-to-Book	-0.086[a] [0.0121] (-7.17)	0.001 [0.0021] (0.72)	0.003 [0.0025] (1.15)	0.002 [0.0020] (1.11)	0.004[c] [0.0023] (1.93)
Relative Deal Size	-0.015 [0.0224] (-0.66)	-0.010[b] [0.0051] (-2.01)	-0.014[b] [0.0058] (-2.44)	-0.014[a] [0.0049] (-2.85)	-0.016[a] [0.0057] (-2.73)
Stock-only financed deals	-0.016 [0.0098] (-1.60)	-0.001 [0.0017] (-0.83)	0.001 [0.0020] (0.44)	-0.001 [0.0016] (-0.55)	-0.001 [0.0019] (-0.60)
Intrastate deals	0.000 [0.0104] (0.05)	0.000 [0.0016] (0.17)	0.002 [0.0020] (1.19)	0.000 [0.0015] (0.17)	0.002 [0.0018] (1.17)
Industry focused deals	0.050[a] [0.0130] (3.86)	-0.001 [0.0023] (-0.27)	-0.003 [0.0028] (-1.22)	-0.002 [0.0021] (-0.84)	-0.003 [0.0025] (-1.34)
Public Targets	-0.016 [0.0100] (-1.56)	-0.009[a] [0.0016] (-5.68)	-0.010[a] [0.0019] (-5.10)	-0.010[a] [0.0015] (-6.62)	-0.011[a] [0.0018] (-5.84)
Constant	3.919[a] [0.1091] (35.93)	-0.192[b] [0.0854] (-2.25)	-0.263[b] [0.1019] (-2.58)	-0.171[b] [0.0799] (-2.13)	-0.300[a] [0.0959] (-3.13)
State Fixed Effects	Yes	Yes	Yes	Yes	Yes
F		17.66[a]	28.59[a]	25.75[a]	49.51[a]
Centered R^2	0.1907	0.0046	-0.0243	0.0191	-0.0692
Uncentered R^2		0.0210	-0.0171	0.0358	-0.0603
SW Chi-square underid	63.16[a]				
SW F Weak id	61.76				
Stock & Yogo critical value (10%) weak ID F test critical values	16.38				
Underidentification test					
Kleibergen-Paap rk LM statistic	61.31[a]	61.306[a]	61.306[a]	231.016[a]	231.016[a]
Weak identification test					
Cragg-Donald Wald F statistic	70.77	70.771	70.771	503.652	503.652
Kleibergen-Paap Wald rk F statistic	61.76	61.762	61.762	308.830	308.830
Stock-Yogo weak ID test critical values	16.38	16.38	16.38		
Anderson-Rubin Wald test F	7.56[a]				
Anderson-Rubin Wald test Chi-square	7.73[a]	-	-	-	-
N	2759	2759	2759	2759	2759

Note: This table presents the results derived from the Instrumental Variable (IV) approach using the Two-Stage-Least Square (2SLS) method. The Political Polarization Index (PPI) is used as an exogenous instrument for the Economic Policy Uncertainty (EPU). PPI is measured using the dynamic weighted nominal three-step estimation (DW-NOMINATE) scores. Political polarization is measured by the average DW-NOMINATE scores for the Republican Senators minus the average DW-NOMINATE scores for Democratic Senators. EPU is estimated by the natural logarithm of the three-month weighted mean BBD overall index for the year preceding the bank M&A announcements. The results derived from the first-stage present the impact of PPI on the EPU, whereas results derived from the second-stage analyses reported the impact of the instrumented EPU on acquirer's Cumulative Abnormal Returns (CARs). CARs are estimated with the market-adjusted model using the CRSP NYSE/AMEX/NASDAQ value-weighted index as market benchmark across four different event windows surrounding the deal announcements. The control variables that are used in the analysis include both bank-specific and deal-specific characteristics and are described in the Table 3. State-fixed effects are also included in the models. Several statistical tests (SW F-stat, Kleinbergen-Paap rk LM statistic, Cragg-Donald Wald F, etc.) are performed to assess both the relevance and the validity of the selected instrument. The coefficients derived from the regression analysis are reported in the first row of each independent variable. Standard errors are clustered using the two-way clustered method both at bank and at year level and are presented in brackets. Both *t*-values (for the first-stage analysis) and *z*-values (for the second-stage analyses) are estimated using the double-clustering method and are reported in parentheses. All variables are winsorized at the 1% and the 99% levels. The superscripts a, b and c denote significance at 1%, 5%, and 10% levels, respectively.

According to the results in Table 46, the instrument (Political Polarization) has a positive and significant (at the 1% level) impact on the EPU, suggesting that increases in the level of political polarization result in increases in the level of economic policy uncertainty. Columns 2 to 5 present the result of the second stage. Specifically, the coefficients of the instrumented EPU are positive and significant (at the 1% level) across all the models. In particular, the coefficient of instrumented EPU varies from +0.050 in the two-day event window (0,1) to +0.081 in the three-day event window (0.2). In any case, instrumented EPU is significantly positively associated with the acquirer's CARs suggesting that increases in the level of policy-related economic uncertainty result in increases in the value creation from bank M&As. Overall, the results derived from the instrumental variable (IV) approach further confirm the main argument that economic policy uncertainty positively affects the shareholder wealth upon bank M&As.

Chapter 8: Conclusions and Implications

This chapter highlights the main findings derived from the empirical analysis of this thesis and provides the conclusions. With respect to the basic results, there are several practical implications for banks, managers, shareholders, policy makers, regulatory authorities, and other stakeholders. The chapter ends by acknowledging the limitations of this thesis and by proposing guidelines for future research.

8.1. Conclusions

Mergers and Acquisitions (M&As) constitute an important form of corporate investments and are associated with valuation effects. This thesis evaluates the short-run and the long-run performance of M&As in the U.S. banking sector, considering the role of Economic Policy Uncertainty. Banks often face uncertainty related to economic policy which may affect the decision-making towards M&A activity. Thus, the main research question that is addressed is whether, how, and to what extent policy uncertainty affects various outcomes of bank M&As. Specifically, this thesis analyzes the impact of several categorical indices of Economic Policy Uncertainty on the performance of M&As, on takeover premiums, on the selection of the payment method, and on the time of deal completion.

The nexus between policy uncertainty and bank M&As is investigated using a large sample of M&As in the U.S. banking sector. In particular, the dataset contains 3,107 completed bank M&As that are announced by U.S. banks over the period 1986-2020. The selected sample period permits a substantial investigation of the effect of policy uncertainty on M&A outcomes in the U.S. banking sector. To estimate the acquirers' short-run performance, the event-study methodology is applied using alternative asset pricing models (market-adjusted model, market model, CAPM, three-factor model, four-factor model, and five-factor model) over ten event windows surrounding the deal announcements. The long-run performance is measured using the methodology of Buy-and-Hold Abnormal Returns (BHARs) over alternative holding periods after the deal completion. The significance of the acquirers' performance is assessed using alternative tests of statistically significance. In the context of univariate analysis, various comparisons are performed among different sub-samples with respect to deal-related characteristics (e.g. cash deals Vs stock deals, private targets Vs public targets, etc) or with respect to the level of economic policy uncertainty (deals amid high-uncertainty periods Vs deals amid low-uncertainty periods). The determinants of the performance as well as the effects of policy uncertainty on both the performance and other M&A outcomes are evaluated using several regression models. To confirm the validity of the results, a battery of robustness checks are performed, including different model specifications, alternative measurements for the main variables, PSM analysis, Entropy Balancing technique, and IV approaches.

The results reveal that bank M&A announcements are associated with negative and significant acquirers' abnormal returns over the 35-year period, regardless of the applied asset pricing model. Acquirers' CARs that are estimated using the market-adjusted model are equal to -0.32% in the three-day (-1,+1) event window upon the M&As announcements, whilst the two-year BHARs are equal to -3.93%. Considering the role of deal-specific characteristics, the results demonstrate that interstate deals destroy shareholders' value by -0.50%, whereas intrastate deals destroy value by -0.18% in the three-day event window surrounding the deal announcements. Acquirers lose by about -0.71% upon the announcement of stock-only financed M&As. However, cash-only financed M&As are associated with insignificant three-day CARs. Acquirers of public targets lose -1.01% upon the three-day event window surrounding the deal announcements whilst acquirers of private targets gain about +0.32%. The results derived from the univariate analysis confirm that intrastate deals, non stock-only financed deals, and acquisitions of private targets are associated with significantly higher announcement returns compared to interstate deals, stock-only deals, and acquisitions of public targets, respectively.

Considering the effect of economic policy uncertainty, bank M&As that are announced during periods of low uncertainty destroy shareholder value by about -0.52% whilst M&As that are announced during periods of high uncertainty at best are associated with insignificant CARs. Specifically, bank M&As that are announced during periods of high policy uncertainty generate significantly higher acquirers' CARs by about 0.46% compared to those that are announced amid periods of low uncertainty. The result of significantly higher acquirers' shareholder wealth during periods of high uncertainty is robust using alternative asset pricing models.

Results derived from the multivariate analysis highlight that the overall economic policy uncertainty (EPU), measured by the index developed by Baker, Bloom and Davis (2016), its components and the various categorical indices have a positive and significant (at the 1% level) impact on the acquirers' shareholder value upon bank M&A announcements. Considering the effect of the overall economic policy uncertainty, the results show that a one standard deviation increase in EPU is associated with an increase by 24.6bps in acquirers' CARs. The main findings document that policy uncertainty affects the market reaction to bank M&A announcements and improves the acquirers' performance.

With respect to the impact of other factors on the shareholder wealth, the results demonstrate that acquirers' short-run performance, measured by the three-day CARs, is negatively affected by AGE, relative deal size, selection of stock-only financed deals, and acquisition of public targets. In any case, there is conclusive evidence that the wealth effects upon bank M&As are not only depend on acquirer-specific and deal-specific factors, but they also depend on the level of economic policy uncertainty that banks face upon the announcement of such deals.

In addition, the results provide evidence that the overall policy-related economic uncertainty has also a positive impact on bid premiums and on time to deal completion, but it has a negative impact on the selection of stock-only financed deals. Bid premiums are positively affected by the level of economic policy uncertainty suggesting that acquirers tend to pay higher takeover premiums amid periods of high economic policy uncertainty. This finding can be explained by the relative decreased acquirers' power of negotiation during periods of uncertainty. Moreover, the results reveal the positive effect of overall policy uncertainty on time to completion implying that acquirers need more time or delay deal completions during periods of high policy uncertainty. Considering the effect of policy uncertainty on the method of deal payment, the overall BBD index for economic policy uncertainty has a significant and negative impact on the selection of stock-only financed deals, implying that acquirers avoid to select only stock as mean of payment and they opt for other methods (i.e. cash, combination of cash and stock, or choice among different forms of payment) amid periods of high overall economic policy uncertainty. However, the effect of policy uncertainty on the selection of stock-only financed acquisitions depends on the source of policy uncertainty which is under examination. Namely, the categorical indices of monetary policy uncertainty have a positive impact on the selection of stock-financed acquisitions suggesting that acquirers who deal with high monetary policy uncertainty are more likely to select stock-financed deals.

Overall, this thesis provides evidence that bank M&A announcements are associated with higher acquirers' shareholder wealth during periods of high economic policy uncertainty. To verify the validity of this finding, several tests of robustness are performed. First, to test the sensitivity of the results derived from the regression analysis, CARs are also estimated using alternative asset pricing models over various event-windows that vary from two to seven days surrounding the deal announcements. The results confirm that economic policy uncertainty positively affects (at the 1% level) the acquirers' shareholder wealth regardless of proxy for the short-run performance.

Second, to test whether the positive impact of policy uncertainty on acquirers' performance holds in the long-run, the impact of policy uncertainty on Buy-and-Hold Abnormal Returns (BHARs) is also examined. The results document that there is a positive impact of economic policy uncertainty on the long-run acquirers' performance using holding periods of two years and three years after the deal completion.

Third, using the methodology of Propensity Score Matching (PSM) to alleviate concerns for self-selection bias, the results confirm that M&As that are announced during periods of low uncertainty (treated group) are associated with significantly higher by about 0.76% CARs in the three-day event window compared to those that are announced during periods of high uncertainty (control group).

Fourth, the results derived from the Entropy Balancing Approach demonstrate that, after addressing self-selection bias, there is a positive impact of economic policy uncertainty on acquirers' shareholder value. Fifth, to alleviate the remained concerns for endogeneity, the Instrumental Variable approach is also applied. Specifically, the partisan conflict index as well as the political polarization index are used as alternative exogenous instruments for economic policy uncertainty. Once again, the results demonstrate that, after addressing endogeneity issues, the level of economic policy uncertainty has a positive impact on the acquirers' abnormal returns. Overall, this thesis provides robust evidence that economic policy uncertainty constitutes a significant factor that affects both the performance and other outcomes of bank M&As.

8.2. Practical Implications

This thesis documents that announcements of bank M&As destroy acquirers' shareholder value over the examined period 1986-2020. However, acquirers' abnormal returns upon bank M&As can be affected by bank-specific and deal-specific factors, as well as by the level of policy uncertainty upon the M&A announcement.

Policy uncertainty constitutes a factor that may affect several investments decisions and their outcomes, including the decisions for Mergers and Acquisitions (M&As) in the banking sector. The results derived from the empirical analysis highlight the role of policy uncertainty in the market for corporate control. Specifically, this thesis provides robust evidence that M&As undertaken amid high policy uncertainty are associated with greater shareholder value. Moreover, policy uncertainty has also significant impact on other outcomes of M&As including the takeover premiums, the time to completion and the selected method of deal payment. In this context, several practical implications can derived from the above findings.

The results highlight that policy uncertainty has a direct and significant impact on several M&A outcomes, including the acquirers' performance, the takeover premiums, and the time to deal completion. Policy makers and regulators should efficiently deal with the multiple existing challenges and therefore they should not overlook that their indecisiveness, the delays in decision-making and generally the uncertainty which is related to their role can affect various outcomes of M&As in the banking sector. Specifically, policy makers and regulators should consider that the uncertainty related to economic policy may raise the targets' relative negotiation power which lead acquirers to pay higher takeover premiums. Moreover, policy uncertainty increases the completion time of a deal, implying that acquiring banks delay or postpone the completion of their investment decisions amid periods of policy uncertainty. Therefore, in case of lack in financial stability and urgent need for implementation of M&As in the banking sector, policy makers and regulators should immediately take actions and adjust their policies so as to reduce the policy

uncertainty and consequently accelerate the completions of the announced M&As. In addition, amid periods of high policy uncertainty, regulatory authorities can pose policies for deal easing so as to push the M&A activity in the banking sector which may boost the acquirers' performance, enhance the acquirers' gains, and contribute to more efficient banking institutions. However, regulators should also consider that bank M&As may increase the concentration in the banking sector and thus the size of banking institutions. Specificall, through M&A activity is likely to build large (in assets) financial institutions which may be designated as systemically important. Consequently, regulators should acknowledge that the higher acquirers' returns during periods of policy uncertainty may induce banks to engage in M&As which in turn may revise the supervisory policies and the existing regulatory framework.

Shareholders and investors should take into account that bank M&As constitute events that generally are associated with negative wealth effects for acquiring banks and hence they should recognize the circumstances under which M&As can lead to opportunities for value creation. The result of higher acquirers' returns during periods of high uncertainty may also indicate that, amid policy uncertainty, market participants and investors consider M&As as an opportunity for more efficient re-allocation of banks' assets which make them more optimistic about the potential synergetic gains from M&As. If this is a case, shareholders of acquiring bank may take advantage of this investor sentiment through M&A activities during periods of policy uncertainty.

Banks may also benefit from the findings of this thesis. In general, bank M&A announcements constitute value-destroying events for acquirers and therefore bidding banks have to consider the circumstances under which they should engage in bank M&As. For example, acquirers gain upon the acquisition of private targets whilst they lose upon the acquisition of pubic targets. Even though this "listing effect" is consistent with a strand of literature, acquirers of listed targets have to further improve the processes of target selection, to better evaluate the targets' assets, to be more cautious over the due diligence periods so as to exploit benefits and to achieve better financial position from engaging in M&As.

Given that prior studies demonstrated that announcements of bank M&As constitute value-destroying events for acquirers, this thesis provides evidence that market reaction to bank M&As is different during periods of high uncertainty and therefore acquirers may rethink the timing of the deal announcement or they should not hesitate to engage in M&A activity due to the policy uncertainty. Specifically, bank M&As initiated amid high policy uncertainty create higher acquirers' value compared to those initiated during periods of low policy uncertainty which gives additional motives implementation of M&A strategy during periods of policy uncertainty. In particular, amid high policy uncertainty, banks pursue to participate in M&A activity in order to either reduce the risk of bankruptcy or to improve, among others, the

operations, the efficiency, the liquidity, the financial status, and the growth opportunities. However, the higher acquirers' value amid uncertainty may be also attributed to higher analytical comprehensiveness for acquirers' decisions as well as to acquirers' diligent investment choices with respect to M&As, that may convey positive information to market participants. In any case, despite the higher returns amid uncertainty, banks should continue to be diligent and highly cautious across all the stages, from planning to the completion of M&A activity.

Moreover, due to the greater acquirers' shareholder value amid uncertainty, CEOs whose compensation depends on the shareholder wealth may have higher incentives for M&A decisions. It is common knowledge that agency conflicts between managers and shareholders arise from M&A decisions (Dahya et al., 2019) and hence banks should properly adjust their corporate governance mechanisms so as to resolve potential agency conflicts that may lead to acquisitions with poor long-run performance.

Given that the M&A activity in the financial sector lead both to larger size and more complex in organizational procedures organizations, the results of this thesis are also useful for bankers and bank managers. Bank managers should consider that despite the negative consequences of policy uncertainty which constitutes a source of systematic risk, periods of uncertainty can also provide opportunities for implementation of value-enhancing strategies through M&A activity. Therefore, bank managers may use M&As as a tool to mitigate the adverse effects and risks that are derived from policy-related economic uncertainty.

Additionally, there is evidence that bank M&As during periods of high policy uncertainty are associated with longer time to deal completion. Therefore, managers should take advantage of this period in order to better scrutinize both the post-announcement procedures and the integration activities so as to support the banks' long-run goals.

8.3. Limitations and agenda for future research

The limitations of this thesis provide a framework for future research and should also be acknowledged. To investigate the effect of policy uncertainty on the performance of bank M&As, this thesis mainly focuses on the acquirers' CARs upon the M&A announcements. Future studies can also evaluate the effect of policy uncertainty on targets' CARs or on combined gains from M&As.

Even though the evaluation of short-run performance is complemented with an analysis of the long-run performance using the methodology of BHARs, future research should fully clarify whether policy uncertainty is associated either with long-

run performance using alternative measurements (e.g. operating performance, industry-adjusted three-year ROA, etc) or with efficiency gains for acquiring banks.

M&A activity has changed the structure and the operation of the U.S. banking sector by creating larger banks which engage in a continuously expanding range of activities. In this context, M&As result in the concentration of the banking industry as well as in the formation of larger banks which in turn may achieve better financial position due to scale economies (Noulas et al., 1990). This thesis provides robust evidence for positive association between economic policy uncertainty and acquirers' shareholder value. However, there is no evidence on whether bank mergers initiating during periods of high economic policy uncertainty are associated with efficiency gains. Therefore, future studies should explore the post-acquisition bank efficiency considering the role of economic policy uncertainty. Moreover, given that different patterns of technical efficiency exist among small, medium or large banks (Kaparakis et al., 1994; Miller and Noulas, 1996), future studies should also focus on whether bank size matters in the nexus between policy uncertainty and efficiency gains from bank M&As.

In this thesis several measurements of economic policy uncertainty are used to fully investigate the nexus between policy uncertainty and shareholder wealth. However, the implications among the separate political cycles are not taken into account. In line with Jens (2017), future studies except from the policy uncertainty may also focus on political uncertainty using the U.S. gubernatorial elections as a source of uncertainty. In addition, even though this thesis utilizes alternative ways of measurement and various categorical indices of policy uncertainty, these proxies remain constant within year and broadly refer to U.S.A., without providing specific information for variations in policy uncertainty among U.S. states. Baker et al. (2022) recently quantified and made available the policy uncertainty index at the U.S. state-level. Future studies may test the validity of our results using the acquirers' state-level uncertainty as proxy for the economic policy uncertainty. In this case, future research may investigate whether the level of policy uncertainty at the acquirers' state affects the acquirers' performance. Moreover, given that Galdino et al. (2022) argued that various dimensions of distance may affect the post-acquisition performance, it is proposed to use a proxy for the "uncertainty distance", namely the difference between acquirers' state-level uncertainty and targets' state-level uncertainty, as a potential determinant for the acquirers' shareholder wealth.

Eaton et al. (2021b) argued that the commonly used measures of takeover premiums resulted in underestimation of the premiums by about 8%. They proposed that, using hand-collected data, deal premiums could be better estimated on the deal initiation date so as to use the target stock prices which are unaffected by the upcoming deal. Future studies should take into account this suggestion in order to evaluate whether

the impact of policy-related economic uncertainty on takeover premiums is sensitive to alternative measurements of bid premiums.

Policy uncertainty may also alter the effects of certain corporate governance mechanisms on the shareholder value. In this context, future studies can also include corporate governance characteristics into the association between policy uncertainty and M&As outcomes in order to determine whether banks should adjust their corporate governance mechanisms amid periods of uncertainty and which corporate governance structure can be beneficial for the acquirers' performance amid periods of high policy uncertainty.

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