Mergers and Acquisitions in the US Banking Sector

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Master Thesis submitted to the department of Accounting and Finance at University of Economics and Business for the acquisition of Master Diploma

Athens

November 2017

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November 2017

CERTIFICATE OF IMPLEMENTATION OF MASTER THESIS

"I consciously declare that this Master Thesis for the acquisition of Master Diploma in Accounting and Finance has been written by me personally and has not been submitted or authorized under any other postgraduate or undergraduate degree in Greece or abroad. This assignment having been implemented by me, represents my personal views on the subject. The sources I referred to for the implementation of this Diploma are all mentioned, giving full references to the authors, including the sources that may have been used on the internet."

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ACKNOWLEDGE

First of all, I would like to thank my Professor and Supervisor for my Master Thesis, Leledakis George, for his guidance, support and advice throughout the course of diplomatic work. In addition, I thank him for his contribution to the cultivation and development of a critical and creative way of thinking. I would also like to thank the co-examiner professors for the time they devoted to the correction of my assignment. I thank all of them for the valuable knowledge both at undergraduate and postgraduate level. Finally, I would like to thank my parents and friends for the support.

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ΠΕΡΙΛΗΨΗ

Στόχος της παρούσας διπλωματικής εργασίας είναι να μελετήσει αν οι Συγχωνεύσεις και Εξαγορές (Σ&Ε) ανάμεσα σε χρηματοπιστωτικά ιδρύματα δημιουργούν αξία για τους μετόχους των εμπλεκόμενων τραπεζών, δηλαδή εάν αποδυκνύονται αποτελεσματικές. Εξετάζεται η αντίδραση των τιμών των μετοχών κατά την ανακοίνωση μιας Συγχώνευσης ή Εξαγοράς στον τραπεζικό κλάδο των Ηνωμένων Πολιτειών Αμερικής. Η αντίδραση αυτή αντικατοπτρίζει την συμπεριφορά των επενδυτών, και ως εκ τούτου τις διακυμάνσεις στις τιμές των μετοχών, κατά τη διάρκεια ενός χρονικού παραθύρου ορισμένων ημερών πριν και μετά την ανακοίνωση του γεγονότος.

Οι Συγχωνεύσεις και Εξαγορές αποτελούν μια από τις βασικότερες στρατηγικές επιχειρηματικής αναδιοργάνωσης με στόχο την ισχυροποίηση και την αντιμετώπιση του έντονου ανταγωνισμού. Η οικονομική πραγματικότητα χαρακτηρίζεται από διευρυμένες και παγκοσμιοποιημένες αγορές, απελευθερωμένο χρηματοπιστωτικό σύστημα, αλλά και υπέρογκα ιδιωτικά επενδυτικά κεφάλαια που είναι σε θέση να επηρεάζουν την οικονομία σε παγκόσμιο επίπεδο. Επιπλέον, σημαδεύεται από τις ραγδαίες τεχνολογικές εξελίξεις στον τομέα της πληροφορικής και των επικοινωνιών, όπου η διάδοση των πληροφοριών και της τεχνογνωσίας είναι καθοριστικό στοιχείο ανταγωνιστικού πλεονεκτήματος και οδηγεί στην επιβίωση και την ανάπτυξη. Σε ένα τέτοιο περιβάλλον πολλές επιχειρήσεις στρέφονται στρατηγικά στην διενέργεια Εξαγορών και Συγχωνεύσεων. Παρ όλα αυτά, είναι μία από τις πιο σημαντικές αποφάσεις που καλείται να λάβει. Οι εξελίξεις που επιφέρει στο ανθρώπινο δυναμικό, στην κουλτούρα της τράπεζας, αλλά και σε ολόκληρο τον κλάδο στον οποίο δραστηριοποιείται καθιστά τις Εξαγορές και Συγχωνεύσεις μια απόφαση που ενέχει μεγάλη αβεβαιότητα.

Στην εποχή που διανύουμε, κυρίως από το 2015 και έπειτα, παρατηρείται μία έξαρση του φαινομένου, τόσο στον αριθμό όσο και στο μέγεθος των συμφωνιών για τις εταιρίες που εμπλέκονται. Το γεγονός αυτό αντικατοπτρίζει την προσπάθεια των τραπεζών να βελτιστοποιήσουν το χαρτοφυλάκιό τους, να μειώσουν τα κόστη και να αυξήσουν τα κέρδη τους.

Αρχικά, αναλύονται οι βασικές έννοιες που αφορούν τις Εξαγορές και Συγχωνεύσεις, τα κίνητρα που οδηγούν τις τράπεζες στο να καταφύγουν σε αυτή τη στρατηγική καθώς και τα πλεονεκτήματα και μεινεκτήματα που προκύπτουν μετά την ολοκλήρωσή της. Η σημαντικότερη διάκριση των Σ&Ε γίνεται με βάση τη νομική τους υπόσταση και τον τρόπο πραγματοποίησης τους, δηλαδή την συνένωσή τους κάτω από την ίδια διοίκηση. Γίνεται η διάκριση με βάση τον κλάδο δραστηριοποίησης των εμπλεκόμενων επιχειρήσεων, την διάθεση των διοικήσεων των εμπλεκόμενων τραπεζών και τη μέθοδο χρηματοδότησης και επισημαίνονται τα κίνητρα που ωθούν στην απόφαση για τραπεζικές Εξαγορές και Συγχωνεύσεις, τα οποία χωρίζονται σε οικονομικά και μη οικονομικά και οι λόγοι οι οποίοι οδηγούν σε μία επιτυχημένη ή αποτυχημένη συναλλαγή.

Στις Ηνωμένες Πολιτείες Αμερικής, το φαινόμενο των Εξαγορών και Συγχωνεύσεων γιγαντώθηκε από τα μέσα της δεκαετίας του '80. Καταγράφονται τα 5 κυριότερα κύματα Σ&Ε, και αναλύονται για το αν κατάφεραν να βελτιώσουν την αποτελεσματικότητα του χρηματοπιστωτικού συστήματος. Αυτή η μελέτη αναφέρεται στη χρονική περίοδο από τον Δεκέμβριο του 2004 έως και τον Δεκέμβριο του 2014 και εξετάζεται η στατιστική σημαντικότητα των υπεραποδόσεων για την εξαγοράζουσα τράπεζα.

Σύμφωνα με την ήδη υπάρχουσα βιβλιογραφία σε μία συναλλαγή Εξαγοράς ή Συγχώνευσης πραγματοποιείται μεταφορά πλούτου από τους μετόχους της εξαγοράζουσας τράπεζας προς τους μετόχους της εξαγοραζόμενης. Οι μέτοχοι της τελευταίας είναι αυτοί που ευνοούνται από την συναλλαγή, σε αντίθεση με τους μετόχους της εξαγοράζουσας τράπεζας. Οι εξαγοραστές-Τράπεζες κατηγοριοποιούνται ανάλογα με την χρονιά, την πολιτεία αλλά και το αν είχαν προηγούμενη Εξαγορά ή Συγχώνευση μέσα στο εκτιμώμενο διάστημα. Επιπρόσθετα, χρησιμοποιώντας το υπόδειγμα των προσαρμοσμένων αποδόσεων ως προς τον δείκτη της Αγοράς καταγράφονται οι μέσες υπεραποδόσεις και οι μέσες σωρευτικές υπεραποδόσεις για ένα διάστημα 10 ημερών πριν έως 10 ημέρες μετά την ανακοίνωση της συναλλαγής (ημερήσια δεδομένα) και ελέγχεται εάν είναι στατιστικά σημαντικά τα αποτελέσματα, μέσω των τεστ της τυπικής απόκλισης χρονολογικών και διαστρωματικών σειρών. Η μηδενική υπόθεση είναι ότι η ανακοίνωση δεν δημιουργεί υπεραποδόσεις. Ακόμα, επιλέγονται διάφοροι συνδυασμοί ημερών ανάμεσα από την ημέρα ανακοίνωσης της συναλλαγής και υπολογίζονται οι σωρευτικές υπεραποδόσεις.

Τα μοντέλα της παλινδρόμησης χρησιμοποιούνται για να αποδώσουν με στατιστικά σημαντικό τρόπο το αν μπορούν οι ανεξάρτητες μεταβλητές να καταγράψουν αποτελεσματικά τις μεταβολές των σωρευτικών αποδόσεων των εξαγοραστών τραπεζών για το διάστημα, μίας ημέρας μετά την ανακοίνωση έως τη δεύτερη ημέρα (+1,+2). Πρώτα παρουσιάζεται η περιγραφική στατιστική των ανεξάρτητων μεταβλητών καθώς και η μήτρα συσχετίσεων, και οι μεταβλητές Return on Equity και Earnings to Price είναι κατά 89% συσχετισμένες, γι αυτό δεν εισέρχονται ταυτόχρονα σε κανένα μοντέλο. Επίσης, υπάρχει συσχέτιση της απόδοσης των Ιδίων κεφαλαίων με την απόδοση των περιουσιακών στοιχείων, ROE και ROA, κατά 54% οπότε αποφεύγεται να εισέλθουν ταυτόχρονα στα μοντέλα.

Στη συνέχεια, επιλέγονται οι ερμηνευτικές μεταβλητές, για να προσδιοριστεί ποια εξηγεί καλύτερα τις μεταβολές τις εξαρτημένης μεταβλητής, η οποία είναι η σωρευτική υπεραπόδοση, και συμπεριλαμβάνονται τόσο συνεχείς μεταβλητές, όσο και δύο διωνυμικές. Για να εκτιμηθεί το φαινόμενο των υπερ-κανονικών αποδόσεων των τιμών των μετοχών σε σχέση κατά την ανακοίνωση μιας Εξαγοράς ή Συγχώνευσης εφαρμόζεται διαστρωματική παλινδρόμηση με τη μέθοδο των Ελαχίστων Τετραγώνων. Για την μέθοδο θα πρέπει να γίνουν κάποιες υποθέσεις οι οποίες αν ισχύουν τότε με βάση το Θεώρημα του Gauss-Markov οι εκτιμήσεις της μεθόδου είναι οι καλύτεροι γραμμικοί αμερόληπτοι εκτιμητές των πραγματικών συντελεστών. Διεξάγεται το τεστ του White για όλα τα μοντέλα και παρουσιάζουν ετεροσκεδαστικότητα, γι αυτό κάνουμε τις παλινδρομήσεις θέτωντας τη Huber-White μέθοδο διασποράς-διακύμανσης στο E-views, για να μας δώσει αξιόπιστα τυπικά σφάλματα και p-values για να μπορέσουμε να βγάλουμε ασφαλή συμπεράσματα για τις μεταβλητές.

Αυτή η μέθοδος συμβάλλει στο να εκτιμηθούν τα τυπικά σφάλματα πιο αξιόπιστα, για να μπορέσουμε να βγάλουμε συμπεράσματα για το αν οι μεταβλητές είναι στατιστικά σημαντικές, γιατί το πρόβλημα της ετεροσκεδαστικότητας, παρ'όλο που δεν επηρεάζει τους συντελεστές, κάνει τα τυπικά σφάλματα μεροληπτικά και δε βοηθάει στο να καταλήξουμε σε ασφαλή και αξιόπιστα συμπεράσματα, και ως εκ τούτου δε μπορούμε να εκτιμήσουμε τη στατιστική σημαντικότητα.

Μετά τα αποτελέσματα των παλινδρομήσεων για τα 5 διαφορετικά μοντέλα, οι ερμηνευτικές μεταβλητές οι οποίες βρέθηκαν στατιστικά σημαντικές είναι η απόδοση των Ιδίων κεφαλαίων, η απόδοση των περιουσιακών στοιχείων, ο δείκτης Tobin's Q και η διωνυμική μεταβλητή που αφορά στο αν έχει ξαναγίνει Συγχώνευση ή Εξαγορά για την Τράπεζα μέσα στη δεκαετία 2005-2014, ενώ οι υπόλοιπες μεταβλητές ήταν μη στατιστικά σημαντικές σε όλα τα μοντέλα.

Συμπερασματικά, οι τράπεζες που εξαγοράζουν παρουσιάζουν αρνητικές μη στατιστικά σημαντικές μέσες υπεραποδόσεις την ημέρα ανακοίνωσης της συναλλαγής, και θετικές στατιστικά σημαντικές σωρευτικές μέσες υπεραποδόσεις σε έναν μόνο από τους διαφορετικούς χρονικούς συνδυασμούς ανάμεσα στην ημέρα ανακοίνωσης της συναλλαγής. Εν κατακλείδι, οι μεταβλητές ROE, ROA, ο δείκτης του Tobin (Q) και η διωνυμική μεταβλητή DMA περιέγραψαν με τον καλύτερο τρόπο τις μεταβολές της εξαρτημένης μεταβλητής, δείχνοντας ότι οι Εξαγορές και Συγχωνεύσεις εξαρτώνται είτε από την κερδοφορία ή από το αν οι τράπεζες που πέρνουν μέρος στη συμφωνία είναι υπερτιμημένες ή υποτιμημένες ή από το εάν έχουν ξανακάνει Συγχώνευση ή Εξαγορά μέσα στη δεκαετία.

ABSTRACT

This study discusses how investors react to the announcement of a merger/acquisition, gathering evidence through the share price performance in the USA Banking Sector. Practically, we investigate how a merger or acquisition affects the shareholder's wealth, the investors reactions and how this is applied to the results through the existence of abnormal returns. We are focusing especially over a fixed period of time for the bidder Banks. A ten-year sample between December 2004 and December 2014, which lead to a record-breaking year (2015) of mergers and acquisitions, is examined about the statistical significance of the abnormal returns of 56 bidder banks around the announcement day. It is a fact that a merger or acquisition transaction transfers wealth from the acquirer's shareholders to the acquired ones. As the financial crisis evolved and reached its peak between the first and the second decade of the 21st century, many banks, under the risk of bankruptcy, consolidated to create a bigger financial institution, as also for other motives. There is a wave of mergers and acquisitions in the banking sector, and the goal is to strengthen the financial stability. To measure the percentage of the efficiency gains that caused an M&A, this survey uses event study methodology, taking cumulative abnormal returns as the dependent variable, in a statistical significant event window. The average abnormal return in the announcement day are statistically insignificant and close to 0, and cumulative abnormal returns are statistically significant and positive in the event window (+1,+2). It is a crucial factor to analyze the variables that determine efficiently the dependent variable, and this procedure requires Ordinary Least Squares method, and multiple regressions to figure out. Then, to solve the Heteroscedasticity problem, we robust standard errors and conduct the regressions with Huber-white coefficient method, for trustworthy estimates. The explanatory variables used in the models are Return on Equity, Return on Assets, the leverage ratio, the earnings to price, the Book to Market, the Dividend Yield, the Tobin's Q measure, the firm size, a dummy variable if there is a frequency in merger or acquisition transaction within the 10-year period, namely as more than one M&A from 2004 to 2014, and a dummy variable depending on the same or different state of the transaction. All variables are due to the existing literature. The empirical results of the cross-sectional model indicate a negative statistical significant relationship between ROE, ROA, Tobin's Q, DMA, and the dependent variable, CAR(+1,+2).

Keywords: Mergers, Acquisitions, Banks, Event Study Methodology, Cumulative Abnormal Returns, Financial Crisis, M&A valuation, Bidder performance

CHAPTER 1: INTRODUCTION

Nowadays, the international competition is a huge factor, leading to Mergers and Acquisitions. The main reason is to create wealth for the shareholders. It is mentioned that acquirers are capable of using efficient management to improve the overall benefits of the Target Bank, and hence the market power. They also suggest that the acquisitions may beat the competition. In the range of globalization and liberalization of the financial services, the rapid effect of the financial innovation has widened the operations in which the banking system are involved over the last years. The regulatory framework of Dodd-Frank targeted the large financial institutions of Wall Street and their potential to cause a chaos in the economy if they failed.

In this paper we examine a sample of mergers and acquisitions that happened in a specific time period for evidence of the source of their gains. Diversification of funding and income, economies of scale, improved management and efficiencies, are factors that M&A may lead to limit the risk. Empirical studies show that acquisitions increase the combined entity's market value. However, there are concerns of the source of the gains. A number of hypotheses have been conducted to explain these gains, such as increased productive efficiency, pause and restructure an inefficient management of the target Bank, and form a market power. The gains to the shareholders standpoint, post-M&A, are efficiency improvements as long as improved performance, increased cost efficiency in scale and scope and capital adequacy, especially following the implementation of its standards Basel I, II and III.

Furthermore, Banks that are part of stronger brand, they can offer products and services at a lower cost than separate entities. Bringing more skilled workers may increase cost efficiency, revenues, by embracing superior pricing strategies or marketing innovative programs. They may activate diversification by either increasing the options of products and services offered or expanding geographically the borders of the institution. Diversification creates value by solidifying returns, cutting down volatility cost, and deliver a high level of capital adequacy in the sensitive segment of lending. The new entity can exploit new technologies and reap the awards of exploitation of the synergies developed within the modern organizations. On the other hand, the possibility of failure of such a transaction depends on executives, on the lack of a good strategic plan, unrealistic expectations or conflicts between the two institutions. However, the key issue is whether a merger or acquisition adds or removes value from the wealth of the shareholders of the participating institutions. From a financial perspective, a successful M&A has a present value of the combined entity's cash flows greater than each enterprise's separately.

The first and the second decade of the 21st century is historically marked by the financial crisis, battling with recession in the era of high unemployment, low GDP and interest rate, huge fiscal deficit, generally economic uncertainty. Dubiety of whether the economy would bounce back soon. The housing bubble burst of 2007, caused by illegal lending policies is the principal reason that endured the real estate market to collapse entirely.

The crisis has shivered the institutions ability to nourish businesses as they are on the verge of losing billions of dollars. Sooner or later, the economies of the biggest countries staggered. Many elite banks such as BNP Paribas and Lehman Brothers are forced to merge due to the huge loan loss provision as their borrowers began to default. Both USA and European countries sensed the banking collapse phenomenon, while their gross domestic product and stock exchanges shrink aggressively. A domino of bank failure was the key for the banks to merge with others in order to survive, either at a small price and or at premium.

In addition, the statistically significant factors that create abnormal returns are analyzed. In the literature it is commonly accepted that there is a transfer of wealth from the shareholders of the acquiring bank to the ones of the acquired. As a conclusion, the bidder companies present statistically insignificant, and close to 0, average abnormal returns in the day of the announcement and positive and statistically significant cumulative average abnormal returns only in the event window (+1,+2). The study consists of four modules. Section two presents the literature review, some key definitions related to M&A's, the motives, determinants and the effects of these transactions, and if they prove to be effective. Section three discusses the data and the methodology used, section four analyzes the empirical results and gives the insights to the conclusions and the direction for a future research, taken part in the section five.

CHAPTER 2: LITERATURE REVIEW

This survey displays a detailed analysis in Mergers and Acquisitions in the Banking sector. There are numerous reviews on the effects of merger or acquisition announcements. M&A's are the most common method for business development, due to the magnitude of changes in the regulatory framework and much more in technology. It's a fact that most of the financial institutions tend to join the domestic and international competition by increasing their market power. The reference to the term of acquisition is about a transaction in which there is a trade-off between one business that transfers the majority or their whole property to the other one. This is conducted either by cash or by exchange of shares through the Stock Market. These are the basic concepts and definitions.

2.1 General Framework in M&A's

Mergers. A merger is defined as the consolidation of two or more firms in which all the assets and liabilities of the acquired are transferred to the acquiring company. In a merger, both board of directors, the acquirer (bidder) and the acquired (target) companies embrace the consolidation and seek shareholder's approval. After the merger's complete, the acquired company ceases to exist and becomes a part of the acquiring company. The absorbed company stops operating without being liquidated, while the acquirer takes charge of all its rights and obligations, maintaining the original identity of the acquiring company. Sometimes, a reverse merger is conducted. In this case, the target firm absorbs the bidder one. Furthermore, there's a possibility that both entities stop their independent route to create a new firm.

Acquisitions. While mergers are the combination of two or more companies to form one, acquisitions happen when one company is taken over by the other. In an acquisition, the acquiring company obtains the majority stake in the acquired firm, which does not change its name or legal structure. In a simple acquisition, the target firm continues to exist after the transaction, in contrast with mergers where the target firm doesn't exist after the transaction.

2.2 Stages involved in any M&A transaction

There are some stages involved in a M&A transaction. Even though companies should be willing to take risks and vigilantly make investments to benefit from the merger, to be able to reduce and diversify risk they make some decisions, narrowing down to the one that will prove efficient. Furthermore, the management of the acquiring firm must learn to be resilient, patient and capable of adopting the change owing to ever-changing balance in the market.

- Part 1: Pre-acquisition review: a self-evaluation of the bidder firm is necessary, a value estimation (preferably undervalued) and the growth plan to expand through the target firm.
- Part 2: Search and screen targets: Includes the scanning for a good strategic fit for the bidder.
- Part 3: Examining and estimation of the target: Detailed analysis of the target company, also referred as due diligence.
- Part 4: Negotiations to acquire the target: Once the target company is selected, the next step is to start negotiations to come to a general agreement. Both companies agree mutually for the deal.
- Part 5: Post-merger Integration: In the case that each part from above complete their purpose successfully, there is a formal announcement of the agreement by both participants.
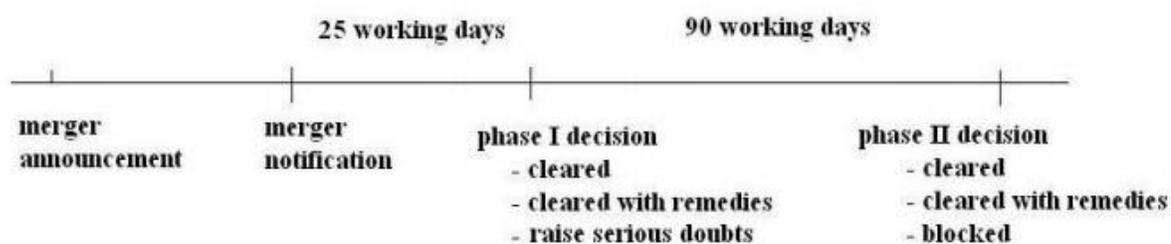

Figure 1: Evolution of an M&A announcement

2.3 Different types and Classification of M&A's

2.3.1 Based on the funding method.

Refers to internal or external sources of fundraising to finance a merger or acquisition transaction. The method shows the acquiring company's exchange amount that they are willing to offer to the acquired one. The type of funding is influenced not only by factors such as company size and balance sheet but also macroeconomic conditions. These are the funding methods:

- Cash on hand. Refers to strategic buyers who use surplus funds in their balance sheet to finance the acquisition transaction.
- Debt financing. Mentioned as the issuing of a new debt for the partial or total financing of an acquisition.
- Equity financing. The acquirer uses shares to complete the acquisition. Although this method is more expensive than the previous ones, it is very common in M&A's especially in large-sized public transactions.

2.3.2 Based on the offer of the transaction.

A merger is divided into merger by absorption, merger by consolidation and merger by acquisition. Proxy fights is a common form of transaction mostly in the United States.

- Merger by absorption happens when the acquired firm vanishes as a separate business entity after the transaction is completed, while the acquiring company maintains their existence alongside with the name and all the transferred assets and liabilities of the acquired one.

- Merger by consolidation. After the transaction, there is the creation of a whole new firm. Both the acquiring and the acquired entities pause their previous legal existence and become part of the new organization, in exchange for the issue to their shareholders of shares in the successor company (probably with cash payment), and all the firms that take part in this situation being deliquesced without liquidation.

- Merger by acquisition is effective as an existing company acquires all the assets, liabilities and the whole corporate identity with cash or shares, of one or more transferor companies. Acquisition either by obtaining the target's share capital or by picking up their assets. The transferors are being dissolved without going into liquidation.

- Proxy fights relates to the shareholders, or some members of the board of director's effort to take charge of the firm and the board of directors by encouraging shareholders to vote through representatives in favor of their ideas and aspects.

2.3.3 In accordance with the disposal of the management of the acquired firm.

- <u>Hostile takeovers</u> appear in case of extensive difference between the involved sides (it is usually preceded a proposal for friendly acquisition but the administration of the acquired has refused it), where the acquiring firm is going to implement its projects through 3 ways: 1. a tender offer to the shareholders that means a direct acquisition of the company's shareholders' shares up to 51% of shares of the acquired firm 2. obtaining the shares of the acquired in the Stock Exchange at a slow pace and 3. a combination of both above strategies.
The basic reason that it is usually preceded a proposal for friendly acquisition is that hostile takeovers cost more to the acquiring company while the final agreement is accomplished when the bid price is much more above the current purchase price of the shares. To be able to complete a hostile takeover, a large spreading of share capital should exist, and the management should have the minimum share possible. This form of redemption brings about negative work conditions between the employees of both acquisition parties and unfavorable consequences for the quality of their work and as a result for the whole firm's efficiency and productivity. Most times the hostile takeover is a last resort in the event of persistent denial of the administration for an acquisition agreement.

- <u>Friendly acquisitions</u> develop when the management boards of both businesses make an agreement and publicize to their shareholders that this form of concentration is approved. It is usually recommended that shareholders should approve the agreement too, based on legal procedures, while the price and the conditions of the acquisition or merger have been defined jointly. More specifically, in the case of friendly acquisition, an offer of shares or cash takes place by the acquiring firm and then the board of directors of the acquired firm accepts the terms of the agreement publicly, after they have been accepted by the shareholders and the regulatory authorities.
In contrast to hostile takeovers, friendly acquisitions and mergers have proved to be more successful deals and are preferred by both parties, because: 1. they cost less to the acquiring company 2. it is an easier and faster way of consolidation and creation of positive work conditions for the employees and as a result for the overall efficiency and profitability (Papadakis, 2007). According to surveys by the European Central Bank, most bank institutions all over the Europe prefer the form of friendly acquisitions.

2.3.4 According to the relevance of industry

- Related/concentric mergers deal with strategies of associated differentiation and take place when there is a correlation of activities that comprise the business value chains, ending up strategic compatibility. When there is a strategic compatibility, opportunities for know-how transfer, competing expertise and other valuable resources are appeared, resulting in cost reduction. Related mergers are usually more valuable to the shareholders (Papadakis,2007). Nevertheless, it is worth mentioning that the efficiency is negatively related to the risk and as a consequence an increased efficiency brings a greater business risk in case of negative changes in the industry, compared to unrelated mergers where the risk is smaller due to diversification. So related merger is composed of businesses which are related to the nature of their activities and differentiates between:

  - ✓ Horizontal mergers or consolidations which take place between firms that do business in the same industry and production sector (otherwise at the same stage of the value chain), they offer the same products and services and they aim to increase their efficiency and as a result their market share. In this case, the firms can either be competitive in a direct way or focus on different market segments. This strategy is a kind of external development of the business and it is often preferred by companies, as they use the competitive advantage of the acquired firm and also reduce the total number of competitors. This will lead to a better exploitation of economies of scale, creation of barriers to entry and reduction of the competition. It should be mentioned that the kind of products which is produced after the horizontal merger occurs, does not differ substantially in contrast to the quality which can be improved significantly. The horizontal mergers are appropriate when competitors are weak, but the industry is attractive enough and there are the skills and know-how for the management of the new business. They are the ideal for expansion into new international markets at low cost and low risk by expanding also the firm's portfolio of goods and services. In the case that after the horizontal merger few companies remain in the industry, then there is an oligopoly. On the other hand, if the company resorts to the absorption of all its competitors, then there is a monopoly. In most states, there is an anti-monopoly legislation that deters from the creation of monopoly situations.

✓ <u>Vertical mergers</u> which take place between firms that produce the same product but at different stages of production. Among companies there is a "customer-supplier" relationship, so in this way the consolidated business can produce its entire production range of the product. This procedure leads to vertical integration in the production process forward (merger with businesses closer to consumer-extension to further stages) or backwards (merger with suppliers-extension to previous stages) and results in the absolute pricing control and reduction of production costs. The company "supplier" benefits in terms of the fact that it avoids the leak of profits to business associates-intermediaries of the production process. However, the company "customer" can intervene in production processes about the quality control of the product. Some other important benefits that derive from the consolidation, are: a. more experienced administration due to the interaction of executives of different production levels which result in better decisions b. the creation of economies of scale c. the increase of the market share d. better quality of the provided product or service and e. easier access to customers. Vertical merger is usually indicated in the following cases: 1. Protection of the quality of the products or services offered 2. Expensive suppliers/distributors 3. Creation of entry barriers for competitors 4. Creation of stable production advantage 5. Fast growth in the industry and 6. Existence of human and financial resources for vertical integration. Nevertheless, there are also some disadvantages of the vertical integration (Papadakis,2007): a. failure to achieve synergies b. cost disadvantages c. difficult exit from this industry and d. perpetuation of obsolete processes.

✓ <u>Congeneric mergers</u> which take place between firms of different type with complementary activities, without any production dependence among them.

- <u>Unrelated mergers/conglomerates</u> deal with mergers and acquisitions between firms which act in different industries, produce entirely different products, have different production technology, marketing techniques and target different consumers, in a few words without any direct relativeness among themselves. They include expansion to new activities, new markets or new products and as a result this strategy involves a lot of risks but yields higher profits.

  The standard reason of this strategy is because the firms realize that the industry in which they operate is unattractive and they want to reduce the business risk of being active in a single business sector. They seek to acquire businesses which will contribute to the increase of its revenues and profits and so its development. Especially, in industries that have matured or are characterized by uncertainty, the diversification is the essential key factor for the sustainability of the firm (Papadakis,2007). This strategy's main goal is to create value for shareholders and for this reason, senior executives make great efforts to find a business that will achieve a better result than each company could have alone.

On the other side, due to the difficulty to exploit the strategic compatibility of the value chain, the unrelated merger is very risky for the viability of the firm. Moreover, there is a need for capable management not only for the choice of the valuable business, but also for the effective business operation, as they will have to coordinate and supervise many different activities and needs of each business. Summarizing, a weak administration and a lack of competitive advantage through the exploitation of strategic compatibilities lead to a certain failure.

2.3.5 In terms of the involvement of the older owners in the management

- <u>Leveraged Buyout, or LBO.</u> A group of investors acquires a company from a loan-funded transaction and they withdraw the company from the Stock Exchange. The loan is served from operations of the absorbed company and sometimes from selling her assets. In general, the company's management remains the same. The purpose of this process is the continuous running of the absorbed company for some years until its value raises and import her into Stock Market as a stronger company. In some cases, the acquiring company resells parts of the business to others in order to achieve synergies. This process anticipates huge profit but also involves a high risk.
- <u>Management Buyout, or MBO.</u> A loan-funded acquisition is organized and implemented by the current administration of the business. Most of the times, there is an investor (sponsor) who offers support to attract funding capitals and access in loan funding through established relationships with financial institutions. Key factor is the executive's belief that they can create more value for the business than current owners. Management buyout manages to eliminate the different opinions between the administration and the Board of Directors-shareholders, as after the successful outcome of the procedure, the owners will take the administrative decisions.

2.4 Waves of Mergers and Acquisitions in USA

As the wave of mergers and acquisitions in the US was the example of many banks in several countries, most of the financial institutions were operating with specific geographical constraints before the wave. They did not expand their stores when the resulting market opportunities were out of the local market. 1981 was the beginning of the prolonged period of banking distress, due to the credit problems faced by the majority of the banks. The loans ranged Latin America to the oil-rich domestic regions, as well as loans for commercial real estate and corporate mergers. These troubled institutions were often targeted by commercial banks that wanted to expand. Most of the bank mergers in the US in the decade of 1980 were completed with the mentoring and help of the government. In the meantime, banks have invented new strategies duo to the increasing pressures on both sides of their balance sheets. In a nutshell, mutual funds attracted the savings of the rich and middle-class ones, and much larger non-financial corporations started to borrow directly at a lower cost in commercial bond and corporate bond markets. Major banks were mainly affected by customer losses and because of this they adopted two strategic approaches. The first one was about offering services such as mutual funds, security and advisory in the investment sector and the second about an upgraded retail banking strategy. Both approaches led to bank mergers and acquisitions to be able to expand in the market. About half of the 6350 bank M&A's since 1980 were in order to expand and penetrate in new geographic markets. Major banking companies led to the second phase of the wave in the US. Mergers and Acquisitions consolidated some of the largest US banks. The biggest one was the acquisition of Chase in 2000 by the Robert Fleming holdings. The surge of mergers in the US spread across national borders. The large size of the domestic banking market and the prosperity of many banks coupled with the presence of globally sovereign capital market institutions made the wave of mergers and acquisitions in the US unique.
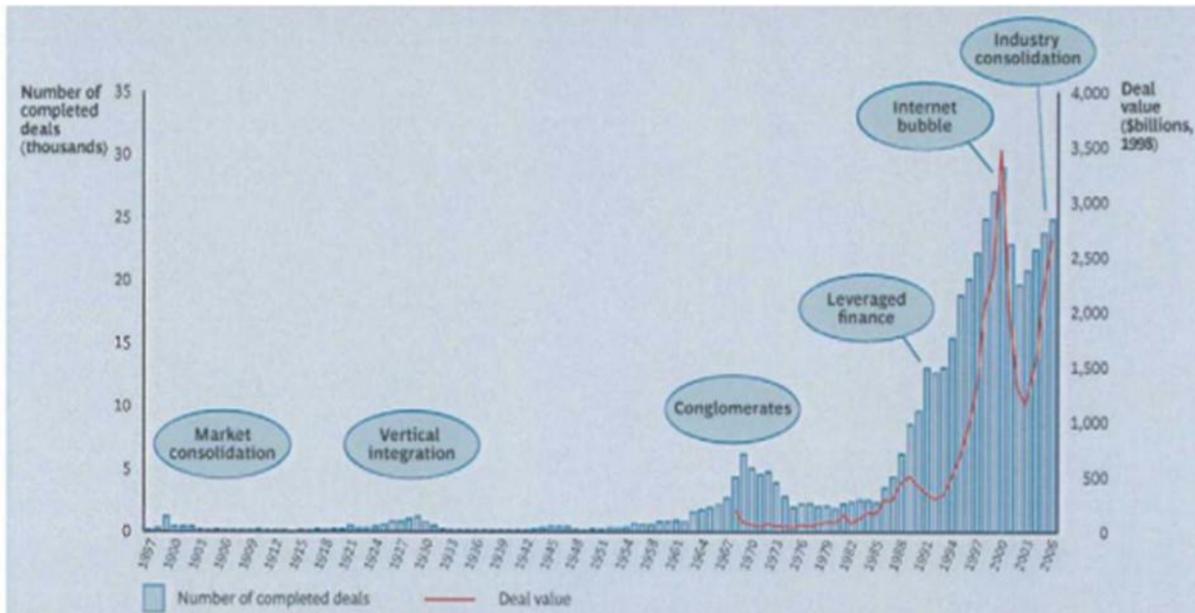

Figure 2: Waves of M&A's

According to Andrade, Mitchell and Stafford (2001) approximately half of the value of mergers and acquisitions in USA between 1988-1998 emerged from sectors that have been deregulated. The 1990's featured as a decade of deregulation, as the number of mergers and acquisitions increased considerably and particularly mergers were characterized by a friendly share exchange. Mergers and Acquisitions occur in waves and are grouped by industry. M&A exist because of the market reaction to unexpected shocks in the industrial section. Technological innovations are one of the blows that cause the industries this restructure. With absorption, new investment opportunities are achieved and long-term barriers to M&A's are eliminated. Approximately 9 out of 10 largest M&A transactions in American history took place in 1998, 4 of which in the banking sector. According to Amel, Barnes, Panetta and Salleo (2004) more than half of M&A's made in the decade of 1990 were among banks. Starting at early 1990's, figure 2 shows the level of the M&A activity from 1897 to 2005. The number of completed deals (in thousands) in combination with the deal value (in billions).

The first wave reached its peak in a period of economic expansion, following a decade of economic growth stagnation. One important part of this wave was the horizontal merger which lead to the formation of a very large and powerful companies, that's why it was described as the wave to create monopoly. In contrast with the first, the second wave was much smaller, developing a great anti-monopoly power in the market, because of the Clayton's regulatory about the splitting of the biggest ones. The third wave was destined for growth. It was longer in duration than the previous two and it lasted until 1971. M&A's were not large at this time and no major acquisitions took place. They were conglomerates, aiming to achieve growth through diversification of new and different markets and products. The fourth wave occurred in the half of 1980's which has two characteristics: acquisitions and takeovers. The two types of corporate organization were very high associated. A lot of US companies expanded the production of the entities that offered opportunities for greater competitive advantage and declined the ones with limited profit opportunities. The fifth, most recent and gigantic, covered the US economy from 1993 to 1999. In 2000 the value of the M&A's transactions was 1.75 trillion dollars while the previews peak in 1989 was 327 billion dollars. A series of new developments in M&A such as the emergence of aggressive takeovers and the ''bustup'' acquisitions where the buyer exploits the position of the diversified company being acquired, and after the acquisition decomposes her portfolio by selling various parts. (Berger & Ofek (1996)).

Moreover, the emergence of LBO's and MBO's, namely the redemption of all shares or assets of one company by a small group of investors through a transaction mainly funded by borrowed funds, and respectively the initiative of an administrative group of executives who redeem part of the shares of the new business.

2.5 Incentives for M&A's

It is obvious that every business has its own incentives to proceed to a M&A transaction according to wider goals that are possible to achieve. There are four motives that cause a merger or acquisition transaction. It's a fact that the development and the expansion of one company's activities can happen in two ways: either internal growth and expansion, or through Mergers or Acquisitions.

There are several motives leading to a M&A. At first, a rational strategic planning and the motivation of business expansion. The pursuit is the expansion of activities, the accumulation of raw materials and new suppliers, the widening of the company's portion in the market, and entering new markets. Economies of scale are desirable. Through the increased volume production is obvious that the fixed and operating costs allocate in more product units. Moreover, most of the times the businesses administrations seek through their vertical production to reach an independent relationship with suppliers and distributors. A second motive is the speculative one, where the goal is to increase the market value of the acquired company and resale her in the future with a significant profit margin. The most common motives are the defensive and the aggressive ones. In the first one, businesses either seek to strengthen their position in the harsh competitive market and increase their size and therefore become less attractive for a competing company to acquire, and in the aggressive, the opposite of defensive, it is possible for an enterprise to run an operation acquiring another to prevent her from deepening her position in the market and become a competitive force.

2.5.1 Economic Incentives

Mainly, there are financial reasons for M&A.

- Wealth maximization A merger or acquisition increases the company's power in the market, which affects the potential investor's confidence in the company. Thus, the share price rise over the years. For a business to survive and grow into a competitive environment a key factor is to maximize the profits and the value for shareholders. Mergers and Acquisitions may increase profitability through: I) efficiency gains which lead to cost reduction and II) increase in market power and as a result in the share price.

Synergies. The acquiring company must underline the existence of synergies by the potential acquisition transaction as it makes easier to attract investors. Synergies may arise from:

- Operational synergies, associated with the benefits from cost savings and the exploitation of economies of scale and scope. Due to synergies, in the first case, same fixed costs lead to more units of production or services (horizontal merger), while in the second, the addition of related or complementary production processes and distribution networks (vertical or incomplete merger) lead to smaller production costs. Economies of scale are more common in horizontal mergers in contrast with economies of scope and economies of learning and experience can emerge both in related and incoherent activities. The vertical integration can lead to a significant cost reduction depending on the company's actions.
- Financial synergies, which lead to lower capital costs. This is achieved by reducing its risk investment portfolio by investing in heterogeneous branches. In addition, the debt capacity of the consolidated company is increasing, especially in the case of conglomerate merger. This is happening because the cash flows of the two companies are non-correlated, and as a result the cash flows of one company can affect the potential negative cash flows of the other and reduce the bankruptcy risk. In other words, larger size and improved credibility of the firm exploits the possibility of a better access in capital and funds.
- Managerial synergies, which take place when the management of the acquiring company has senior skills, higher than the acquired one, which eventually benefits from the transaction. With the proper use of management team is achievable to increase the efficiency as all critical decisions and strategies start from the upper hierarchical levels. In many occasions there is a replacement in the acquired company from highly qualified executives of the acquiring one. Either their abilities are specialized, e.g in production, research, marketing, they can be utilized in horizontal and vertical mergers or in the case that they have more general skills and knowledge, e.g management, planning, control, they can be used effectively in uncoordinated mergers. Such synergies are intangible, and they are difficult to quantify, while they are based on companies' ability to transfer their knowledge. (Haspeslagh and Jamison, 1991)

Increase in market power, following by an increase in profitability and the position in the market. In M&A's, banks seek to improve their position in the market, especially by obtaining a larger company. This is the way to increase the market share. In addition, they can increase the loan rates and decrease the interest rates on deposits. A higher price suits especially in horizontal mergers, where the acquiring of a greater market share maximizes the capacity against competitors. Most of the times, companies engage in M&A to dominate their sector, creating a monopoly, although this isn't desirable for regulatory authorities. There is a commission about the competition which is responsible for controlling and protecting the market from the emergence of monopolies and oligopolies, setting limits on their actions to prevent the unfair competition. In addition, an increase in the price may also occur in vertical mergers in order to set the barriers so that a new competitor can't entry, with favorable conditions for the location and the performance of the business (Berger, Demsetz, Strahan 1999).

- Formation and exploitation of economies of scale and scope. Economies of scale are created by increasing the volume transactions and the disposal of banking products and services in general. A bigger company placing the orders can reduce costs. M&A's also translate into improved purchasing power to buy equipment or office supplies. It's a fact that when there are placing larger orders, companies have a greater ability to negotiate prices with their suppliers. As the firm grows stronger, there is a growing ability to reduce the per unit cost as it takes full advantage of its power in the market and allocates the fixed costs to more units per product, which most of the times happen through horizontal and unrelated M&A's. Economies of scope are created through provision and disposal of diversified products and services so that they can satisfy the customer's needs. Both economies of scale and scope reduce the operating costs of the banks.

- Tax benefits. Companies with high profits (hence high rates of tax on profits) acquire others with losses for tax relief due to the lower total profits of the consolidated entity. This is confirmed by the study of Auerbauch & Reishus (1987) about the importance in tax exploitation between companies. They use M&A's for tax purposes, although this may be an implicit rather than an explicit motive. For example, since the U.S. has the highest corporate tax rate in the world, some of the American elite companies acquired a smaller foreign competitor and moved the merged entity's taxes overseas to a lower tax authority to substantially reduce the tax bills. The new entity has larger figures in the balance sheet. More equity reduces risk for both shareholders and lenders.

- Acquiring a new technology. To stay competitive, companies need to stay on top of technological developments and their business applications. Buying a smaller company with unique technology innovations, a large company can maintain or develop their competitive edge. Technological progress contributes to obtainment, management and dispersion of information.

- Bigger size. Banks use M&A's to become bigger financial institutions and dominate the market. Probably, it will take years or decades to double the size of a company through organic growth (the growth rate a company can achieve by increasing output and enhancing sales internally), but this can be achieved much more rapidly through M&A's. For example, e-banking through internet replace the traditional process through branches. However, new technologies are particularly costly and can be implemented mostly by large groups, so an M&A transaction can create a new bigger and stronger financial institution capable of supporting similar actions.

- <u>Risk Diversification.</u> Diversification is the strategy of a business to enter in a relative field or, most of the times, in a completely different from the one she already operates. This strategy differentiates the portfolio and hence reduces the risk. On the other hand, ensures an easy transition to new branches not only because of the knowledge of the acquired company for the operations but also for overcoming any barriers to entry, of distribution, know-how, facilities, and others. In addition, banks manage to overcome their seasonality of sales and influences from the outside environment of the business. An important incentive for M&A's in banking industry is to achieve profits through the diversification of risk in the portfolio. This means that if one bank faces financial problems the other's cash flows will not be influenced and ideally could be able to compensate the losses. According to Pilloff & Santomero (1998), there are two ways to achieve this in the financial sector, by geographic expansion or by diversification of the product. A geographical expansion of the financial institutions is extending to new areas within and across borders and helps to create a well-diversified portfolio to deal with the potential financial risks effectively. The relation between return and the risk moves in the same direction. High return leads to high risk. However, sometimes an addition risk creates increased costs or its even not permitted duo to regulatory provisions in the country in which a bank is active. In such cases, maximization of wealth of the shareholders can arise from well diversified profits. As mentioned, the acquiring banks are looking for profit diversification to raise their cash flows, while they maintain the same level of risk. If the returns of the banks' profits from expanding to new markets are not correlated with returns from the already existing markets, then the total return on profits will involve lower business risk. Productive diversification occurs when banks expand their productive potential providing new financial products and services. M&A's between financial institutions operating in different products and services may create the conditions to reduce the cost of products due to the use of knowledge and skills from the already qualified staff as well as the existing clientele of the acquired organization.

- <u>Game theory</u> continuously influence the strategies, the one another's strategy, of the participants. It applies to many industries and deals about how players make decisions when they are competitors or allies. Basic condition is the rational behavior of both parties. The player chooses the best strategy which will bring the best results and doesn't react emotionally. The result of each player depends not only on his choice but also on the movements of the other player, creating a situation of competitiveness and interdependence between them. Players, or in this case businesses, choose the strategy at the same time, without any communication or information about the plans of the other. That's why banks try to predict the potential actions of their competitors in the market. They may proceed to a merger or a takeover, considering as it is the most appropriate strategy decision in this case.

Companies buy others to reach new markets and grow revenues and earnings. A merger may expand two companies' marketing and distribution, giving them new sales opportunities in different markets. An M&A transaction can improve a company's standing in the investment community. Bigger firms often have an easier time raising capital than smaller ones. There are many other theories leading to M&A's, briefly including two more.

- The valuation theory, mentioned as the acquisition of a company because of the better information than the Stock Market. In other words, the target company, or just an individual asset of the company, is underestimated in the market and the acquiring company has an internal information and hence benefit from the transaction.
- Disturbance theory, as Gort (1969) pointed out, is the phenomenon that waves of M&A's happen in periods of economic crisis.

Transaction characteristics	Effect in CAR
Stock payment	Negative
Combination of stock and cash or cash only	Positive
Insurance company	Positive
Hostile takeover	Positive
High number of potential bidders	Positive/ Negative
High number of potential targets	Positive
Product diversification	Positive/ Negative
High M&A activity	Positive/ Negative

Table 1: Effects based on the Transaction Characteristics

2.5.2 Non- economic incentives

Despite the economic reasons-incentives, there are microeconomic and macroeconomic factors responsible for banking M&A transactions. In recent years researchers focused on the characteristics of behavior and expectations of owners, executives and other people involved in the M&A transaction. A reason that shows the importance of the non-financial incentives is that executives not only act as agents-employees for the businesses and its owners but also seek to satisfy their own interests. Usually the problem begins when managers choose the target bank for the M&A until shareholders and owners of the company get involved. Hubbard & Palia (1994) mentioned that executive salaries have a direct impact in the decisions of M&A's. They conclude that the excessive pride and optimism leads managers to overestimate the benefits of an M&A transaction, damaging the company. Not only economic and personal but also psychological reasons lead to failures and disappointments in mergers and acquisitions. In terms of motivation, they are known as achievement motive, prestige motive, sensation motive and power motive. Owners tend to protect the name of the company and their property, the competitiveness of the firm, the promotion of an executive to a manager of a larger business unit and others.

According to the latest surveys, among these motives, there are two psychological traps that lead to a failure and these must be resolved properly. They are fear and uselessness. When someone believes that if the company does not increase the size the competition will destroy them, then this person fears, feels threatened. And the quickest and easiest way is to merge. But if this is done without any real and meaningful reason, it can simply reduce the flexibility and the administration level. Gradual uselessness refers to bureaucracy and systematization of goals and jobs, leaving little space for spontaneous activities, personal development and innovative actions.

Partner characteristics	Effect in CAR
High acquirer growth	Negative
High target growth/market performance	Positive
Higher efficiency/acquirer's performance	Positive
Low target performance	Positive
Large overall transaction size	Positive/ Negative
Prior acquisition experience	Positive
High degree of strategic similarities	Positive
High management ownership	Positive
High overlap of operations	Positive

Table 2: Effects based on Partner's Characteristics

2.6 Determinants on success in M&A

- Features of the bidder and the target company. A crucial factor is the similarity in the strategy of two banks and the environment, the market, in which they operate. According to Ismail and Davidson (2007) the growth rate of the target bank leads to a better return on the M&A transaction, as measured by the increase in assets and the market performance. Akhavein, Berger and Huphrey (1997) in their study state that huge differences in returns between the acquiring and acquired bank result in higher returns of the whole new entity. DeLong (2001) and Campa and Hernando (2006) agreed that the size of the firms is important in a successful transaction. DeYoung (1997) and Berger (1998) agreed with Kolaric and Schiereck (2014) about some banks that if they often acquire others, tend to show better results than those who do not often use M&A's. In the case of Wheelock and Wilson (2004) banks with the highest experience in that type of transactions seem to pursue more and more the mergers and acquisitions, especially if the previous deals were successful. Altunbas and Marques (2008) believe that the high degree of similarity in strategies of the banks increases the probability of a successful deal.

- The form of transaction. The exchange for which a merger or acquisition will be agreed is a crucial factor in the transaction, and is determined by company's cash, the profits and other's. When share prices in the Stock market are increased, a share exchange is preferred. When the share price is low, there is an agreement of cash preferable, indicating the different effects in the transaction. Baradwaj, Dubofsky and Fraser (1991), Becher (2000) and Ismail and Davidson (2007) believe that from the acquiring company's shareholders point of view, a combination of shares and cash or cash only may lead to better results because a payment conducted only with shares most of the times results negatively. Becher (2000) believed that if a target bank is very popular in the market and many firms try to acquire her, the target bank may have huge profits from the premium they will receive from the bidder company. In addition, James and Wier (1987) state that there is a huge amount of target banks that may lead to profits for the acquiring companies, indicating the opportunities in the market. Although, there is a difference between the friendly and the hostile takeover. In a successful hostile takeover, the acquiring company, as Baradwaj (1990) mentioned, has lower returns compared to the friendly one.

2.7 Determinants on failure in M&A

- <u>Role of executives</u>. According to Roll (1986), managers are making mistakes when they evaluate mergers and acquisitions. They overestimate their capabilities, evaluating the target company in different criteria than the rest of the market, and as a result they pay premiums that doesn't reflect the real value of the company. This is known as the <u>Managerial hubris</u>. There are many M&A's completed to maximize the managers' individual position and not the one of the shareholders, they pursue personal goals such as increasing earnings at the expense of maximizing the value of the company. Furthermore, the <u>agency problem</u>. This is explained as the difference between the interests of managers and shareholders and the company's in general and may lead to a wrong decision in contrast with the interests of the company.

- <u>Consolidation Difficulties</u> One of the most important factors of failure in a M&A is effective consolidation of the two separate entities. Integration requires careful planning and sometimes is time-consuming. The process of implementing synergies is to unify different control systems and different cultures and effectively design ways to capitalize on human potential through the production process. Employees find it difficult to familiarize themselves with the new partners. Also, internal frictions and competition emerges between staff, debating about the different wages and different career paths.

The figure illustrates the total number of deals and the annual aggregated deal values of completed U.S. bank mergers announced between 1990 and 2014. The data are collected from Thomson ONE database. The sample consists of mergers between banks listed on NYSE, Amex and Nasdaq exchanges.
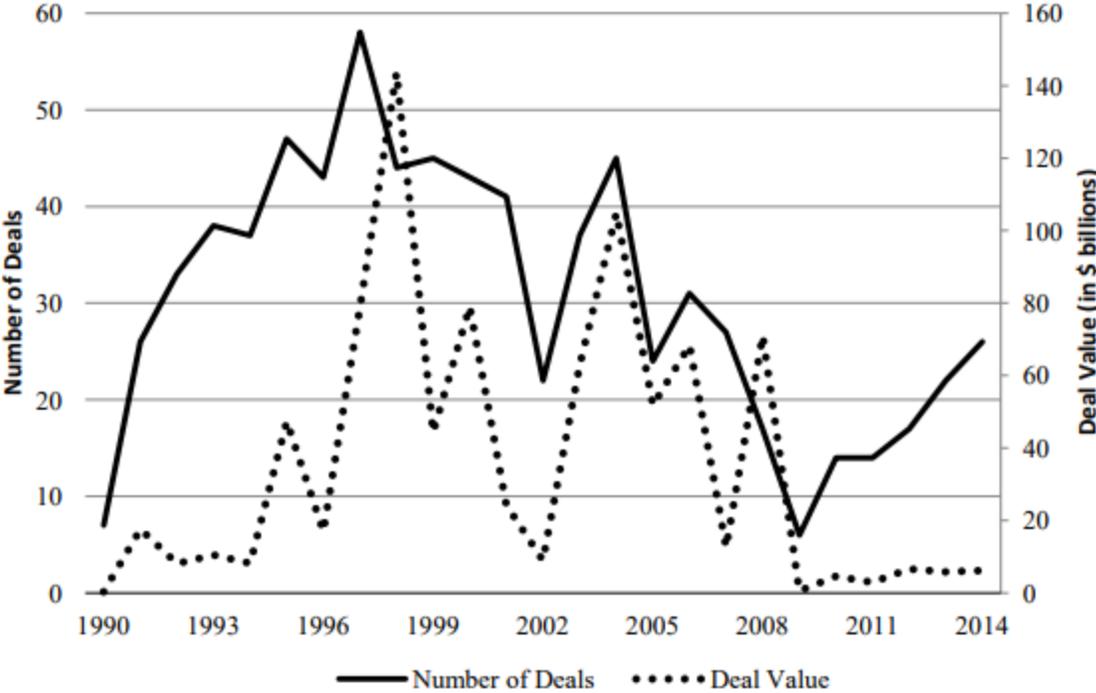

Figure 3: US Bank M&A's during 1990-2014

2.8 Too big to fail Banks

Although ''too big to fail'' (TBTF) has been a perennial policy issue, it was highlighted by the near-collapse of several large financial firms. The toxicity of the problems raised by TBTF banks has been understood in United States since the collapse of Continental Illinois in 1984. Policymakers justified the use of government resources as the firms were ''systemically important'' so they try to rescue them. Popularly, this is called 'too big to fail'' phenomenon. TBTF, banks with higher than the famous $10 billion asset-size threshold or one of 11 biggest banks in any year asset wise, is the concept that a firm's disorderly failure would cause widespread disruptions in financial markets that couldn't be managed.

Although the government had no explicit policy to rescue these huge banks, several of them rescued once the crisis struck. TBTF subsequently became one of the highest systemic risk issues that policies grappled with in the middle of the economic crisis. Systemic risk mitigation, including eliminating the TBTF problem, was a major goal. Different parts of the new legislation jointly address the TBTF problem through requirements for the safety of the other financial institutions, to limit the size and the types of activities a firm can engage in. They tried to manage the creation of a new receivership regime for resolving failing non-banks that pose systemic risk.

The financial crisis reduced the number of large financial firms, but led to a new problem because they increased their size through a series of mergers and acquisitions. Preventing firms from failing is argued to be necessary for the maintenance of the financial stability in the short run. On the other hand, rescuing TBTF firms is predicted to lead to a less stable financial system in the long run because of moral hazard that weakens the market discipline. Moral hazard exists when TBTF firms believe that they won't fail just because of their size and importance in the market, so they decide to take even greater risks than they otherwise would have done because they believe that they are shielded from the financial system. If TBTF firms believe that they will not be allowed to fail, then private firms capture any additional profits that result from high-risk activities, while the government bears any extreme losses.

Brewer and Jagtiani report in their surveys in 2007 and 2009 that the ten biggest banks in the USA enjoy the benefits as they operate at a lower rate of capitalization and pay less for their capital compared to small banks. Also, that the selective procedure about the significant amount of insurance premiums paid to banks only if they are over a certain size, in accord with Schmid and Walter (2008) highlighting the period between 1985-2004 and concluding that huge amount of insurance premiums paid to large financial institutions. Morgan and Stiroh (2005) clarify that the bonds of TBTF banks are more stable in the valuation changes, showing investors' optimism about bank ratings. According to DeNicolo and Kwast (2002) the correlations in the yields of the TBTF bank shares in the USA had increased in the decade of 1990, but in the decade's second half reduced due to consolidations.

Furthermore, we can see papers like Houston, James and Ryngaert 2001, who examined major bank mergers concerning the time of a decade between 1985 and 1996 and were unsuccessful to discover if mergers generate worth for large banks. In addition, Cybo-Ottone and Murgia (2000) found studies associated with the stock market valuation of M&A in the European banking industry and noticed a positive and significant increase in value for the average merger at the time of the announcement. Moreover, their results were different from the reported for US bank mergers. An explanation for these results could stem from the different structure and regulation of European banking markets compared to the US markets.

2.9 Studies measuring the efficient results on Mergers and Acquisitions

In empirical research, the most common and popular methodologies measuring the performance of M&A's in the banking sector are: accounting studies, event studies, efficiency studies and performance studies.

2.9.1 Performance studies

Performance studies use accounting ratios to analyze the significance of the performance of the banks after the M&A transaction. A successful transaction is when the post-merger ratios significantly improve and if this can be attributed to the merger. Hoshino and Turnbull, (2002), in their study employ a paired analysis while Kwan and Wilcox, (1999) use a control group to mitigate the situation. Boyd and Graham (1988) employ more specific estimation methods based on panel data. Performance studies allow simulations of hypothetical mergers. In another paper, Kwan and Wilcox (1999) adjusted their data to account for the different accounting methods that the acquiring banks can use when they complete a M&A transaction. The accounting method can alter the cost performance of the acquiring bank, not only in the merger year but also in the following years and should therefore not be disregarded. Other surveys show that the financing choice of an acquirer (cash, debt, equity) can have a fundamental effect on the post-merger performance and should therefore be carefully examined about the performance ratios in the analysis. DeLong and DeYoung (2007) prefer the performance studies because accounting data use past performance rather than future returns, as shown by the Stock market data. Performance studies divide in Accounting studies and Event studies.

2.9.2 Accounting studies

The method is considered unbiased, since it examines actual data. Extensive financial statements and results, such as balance sheets, ratios and returns before and after the consolidation, are examined. An important factor is the ratios of capital efficiency, return on invested capital and earning per share. In addition, useful conclusions are drawn from the comparison of two companies' samples of a business sector, merging and non-merging companies. This method presents the advantage of credibility, as the financial results are through careful recording of a fairly long period of time. The downside is the possible change in the balance sheet of the company, as well as a change in the taxation, which causes weaknesses in comparison over time.

2.9.3 Event studies

The methodology used in such studies is to estimate the reaction of the share price from the announcement of various actions such as an M&A disclosure, splitting shares, dividends, an increase of share capital, while we look at the case of M&A's. In case of efficient financial markets, the stock market reactions to M&A announcements could held the prediction of the profitability in the future. The calculation of the reaction in the share price is calculated as the difference between actual and expected value. The last one is calculated in several ways, either based on historical data of the share price (goes on up to M&A transaction) based on the performance of a stock market index or the capital asset pricing model, CAPM. The difference between real and expected price indicates the magnitude of the change in the share price. Consequently, shows the positive or negative outperform, resulting from the announcement of an event such as M&A. Denotes the allocation of wealth from the shareholders of the buyer to the target banks shareholders. The sensitivity of the share price is expressed by calculating the abnormal returns for a specific period before and after the announcement of the event. This is defined as the difference between the actual performance and the hypothetical if the event had not occurred. The first to use it was Fama (1969), and since it is one of the most important methods of assessing a M&A transaction. Advantage of this method is to draw conclusions shortly, as opposed to the accounting studies, where drawing up balance sheets takes time. There is a period set for some days around the announcement, and this is when share prices and their yields are examined (day 0). This time is defined as an ''event window''. Finally, from the beginning of 1970s there is of this study in many surveys, despite the objections about its weaknesses and limitations (Duso, Gugler and Yurtoglu, 2010).

2.9.4 Efficiency studies

Considers a M&A transaction to be effective if after the deal is completed the combination performance moves closer to the effective boundary. The further from the effective border, the better margin of improvements in the efficiency for a company. Efficiency is estimated using parametric and non-parametric techniques, preferably the first ones because they focus on economic optimization and not only on the technological optimization. That's why they fit to the concepts of cost and profit efficiency in a better way. There are three most important concepts, i) cost efficiency, ii) standard profit efficiency and iii) alternative profit efficiency. Berger and Mester (1997) prefer the second concept as their starting point for analyzing the success of a M&A operation. They also examine the other ones and found that each of them is robust and it makes little to no difference which of the techniques is used since they yield in a similar way. Shaffer (1993) used it in early 1990s to assess the impact of M&A's transactions in the banking sector. According to Berger and Humphrey (1997) the efficiency study is a sophisticated reference method and differs from the event study in the approach of data. Berger in 1999 advised to investigate the origin of the changes in the profitability and simulate possible M&A's. Thus, it is possible to compare the simulated with the real, although the actual earnings are usually fewer than the potential ones.

2.10 Comparison of the research methodologies

Taking the different advantages and disadvantages into consideration, all the approaches have benefits and choosing between those three depends on the research topic. Event studies are the best way of assessing shareholder value and result information about financial institutes about the M&A transaction. Both shareholders of the acquiring and the acquired bank will base their decision on their personal wealth opportunities. However, the market estimate may be inaccurate at the date of the announcement of the M&A and endanger the success of the transaction both in the short and the long term. Dynamic efficiency studies are the preferred tool to analyze the profit and cost efficiency gains before and after the M&A transaction. Performance studies should be interpreted with caution. They show the long-term impact of a M&A, the market reactions and measures the success of the transaction. A disadvantage of the empirical studies is that they sometimes lead to distorted results due to the complexity of the data.

2.11 Evaluation of the research methodologies

The empirical results seem rather heterogeneous at first. The joint Hypothesis problem, endogenous to event studies, doesn't seem to affect, as the event windows are usually short, and the results should therefore be robust against misspecifications of the market model. Americas M&As most of the times include holding companies (SIC code 671) and banks (SIC code 602) (Becher 2000). In European M&A's, they usually require the bidder to be a bank and the target either a bank, a financial institution or an insurance company. (Ottone and Murgia, 2000). Overall, empirical findings in credit institutions are consistent. For performance and efficiency studies, the use of accounting data as an input may lead to heterogeneity in the resulting data. Banking M&A's in US were more successful in the 1970's and early 1980's. After this period, surveys show significant negative abnormal returns, exactly the same as in the European banking sector. Further integration of financial markets in Europe through the introduction of the Euro as currency, led to insignificant abnormal returns for the M&A's after 1999. Recent evidence in Bank M&A's in emerging markets still shows positive abnormal returns for bidding and target firms. Increased competition among banks for potential targets can lead to higher premiums, which in turn will lead to capital markets to evaluate better the transactions. However, high acquisition costs will affect the performance of the bidding bank, which in turn can partially explain the mixed results of the performance and efficiency studies.

2.12 External effects of M&A's

Several papers have examined the impact of a consolidated industry on customers of the banks. U.S. studies tended to find the consolidation in the 1980s with lower deposit rates and higher loan rates in more concentrated markets. Although, other studies used 1990s data and shown weaker relation between deposit rates and the market concentration. There is also evidence that large merging banks allocate a lower level of their assets to small business loans compared to small banks, although these opposite effects emerged to be offset by an increased flow of credit to small businesses from small banks. (Berger et al. 1999). Overall, the literature before the second century advise that both in price and availability of banking services the impact of bank M&A's is comparably modest.

The price and availability of business credit Recent papers above all centered on the effects of bank mergers on the price and access of small business credit. These surveys conducted not only by the importance of understanding the market power effects from mergers, but increasingly by an interest in relationship lending in banks' credit decisions. Cole, Goldberg and White (2004) mentioned that large banks tend to base their small business lending decisions more on financial ratios, while small banks rely more on the character of the borrower. Small banks also use a variety of information sources to deliver business loans, such as collateral and spreadsheet analysis. The evidence on the determinants of bank M&A' and market consolidation on credit availability is mixed. Some researchers found that M&A's reduced credit availability for small borrowers while others insisted that these market power effects depend on the specific product in question. Hauswald and Marquez (2006) showed through a theoretical model that mergers enable banks to obtain private information to grow their market share and soften lending competition. Investment information declines as competition increases leading to lower loan rates and inefficient lending decisions.

Depositors and other stockholders. Bank mergers and banking market consolidation create an impact is deposit rates. The cross-country study by Corvoisier and Gropp (2002) showed that the increase in the concentration in the banking sector between 1993-1999 created a simpler and less competitive pricing in some kinds of deposits, but not in all of them. Craig and Dinger (2009) discussed the results of previous studies and based on some advanced econometric techniques showed that deposit interest rates declined for the next two years after the merger or acquisition. Focarelli and Panetta (2003) found that post-merger deposit rates decline initially, but increase in the longer run. Studies argued about the significant effect of the unification of the industry in the financial institutions system, and identified that the Federal Reserve System saw significant declines in check-processing volumes as the unification of banking system strengthened.

CHAPTER 3: DATA COLLECTION AND METHODOLOGY

3.1 Data sample

This survey examines the historical returns of Mergers and Acquisitions took place in the US banking sector between December 2004 and December 2014. The goal is to analyze the market reaction which is reflected in share prices, at the day of the announcement of the M&A transaction. The database ''Thomson Reuters Eikon'' and ''DataStream'' where the sources to extract the information.

Thomson Reuters Eikon

The collection of financial data and information about the announcement date and Mergers and Acquisitions of each bank. During the procedure, the data filtered to produce the proper results, due to the following criteria.

- Mergers and Acquisitions in the US Banking sector.
- The form of transaction is either Merger or Acquisition of Assets.
- The sample is a period of 10 years from 2004 till 2014.
- Firms can be either all types of Commercial Banks or Savings Bank.
- The deal status is completed.
- The deal attitude is either friendly or hostile.
- The acquirer status is either public or private.
- The firms are listed in the Stock Markets of NYSE, Nasdaq or Amex.
- The acquirer nation is United States, the region Americas and the industry, Banks.

DataStream

The next step after collecting data on M&A's in the US banking sector in Thomson Reuters Eikon, is to use the DataStream database. Each Bank has a unique code and this code differs from Eikon to DataStream, so there must be and exact match to make DataStream understand the procedure and deliver the results. Although the primary sample was 262 mergers and acquisitions in the US banking sector between 2004 and 2014, since Thomson Reuters Eikon is a new database, replacing the Thomson One, some identification problems forced a final sample of 56 acquirer banks. Each financial institution has a separate CUSIP (Committee on Uniform Securities Identification Procedures) number that is attributed to all the shares and bonds in the US and is used to make the difference between the trading securities in the markets. Additionally, the next step is to sum up the yields of market index, such as Market Value, Total Debt, Net sales or Revenues, Total Return index, Proffered Stock, Total Assets, Operating Income, Common shareholders Equity, Net income before Dividends and Market Capitalization. This is appropriate to create the independent variables for the regression.

Mergers and Acquisitions per Year

Observing the diagram 3.3, the majority of M&A's occurred in 2014, in contrast with the 5-year period from 2005 till 2009. This is related to the huge financial crisis, making the bidders more reserved in front of a deal.
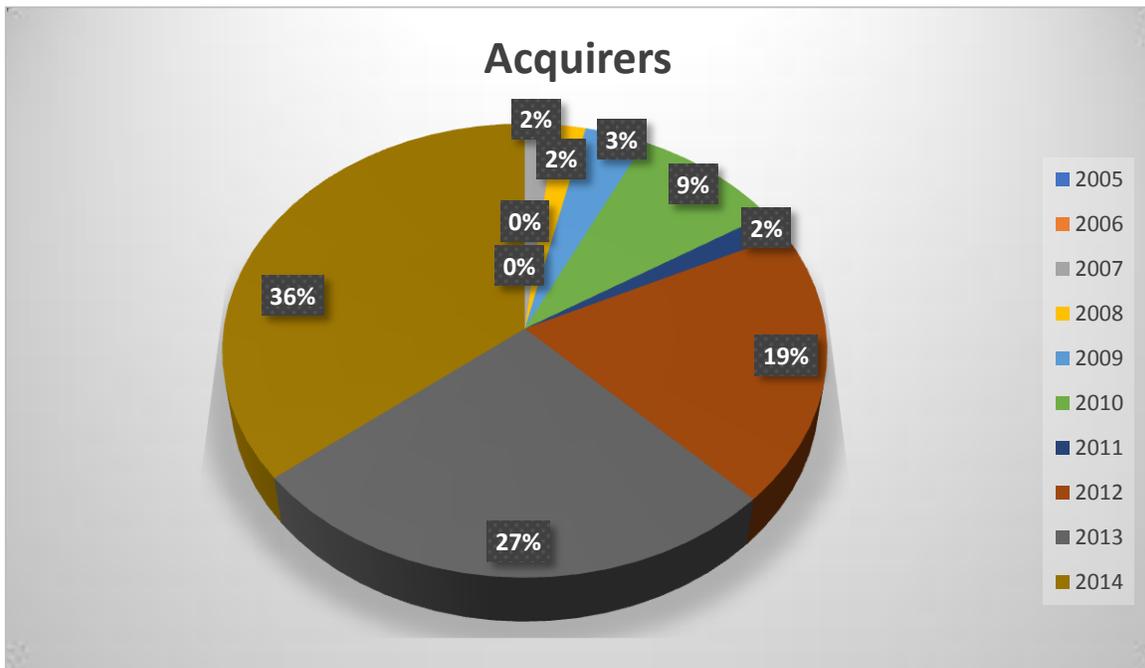
Figure 4: M&A's per year

Mergers and Acquisitions per State

It is noteworthy that in Pennsylvania, California and Virginia happened the most M&A's, 37,5% of the total number. Extensively, in the diagram 3.4 all the M&A's among banks in the same state.
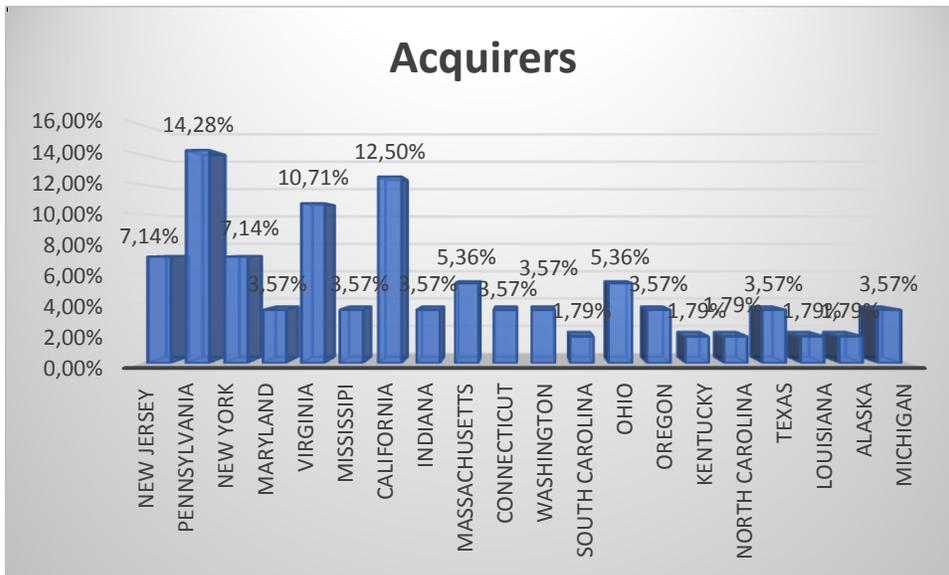
Figure 5: M&A's per state

Prior experience in Mergers and Acquisitions inside the 10-year period

Several banks that had a successful M&A transaction in the past, they are more likely to re-enter this transaction. It is remarkable that most of the 56 bidder banks acquired once more in the decade. Figure 6 presents the bidders that acquired not one but two more times in the decade, and the deal sizes. In December 2005, BB&T bank acquired Main Street Banks Inc for $ 628 million. Note that Berkshire Hills Bancorp acquired 4 times more in the decade.
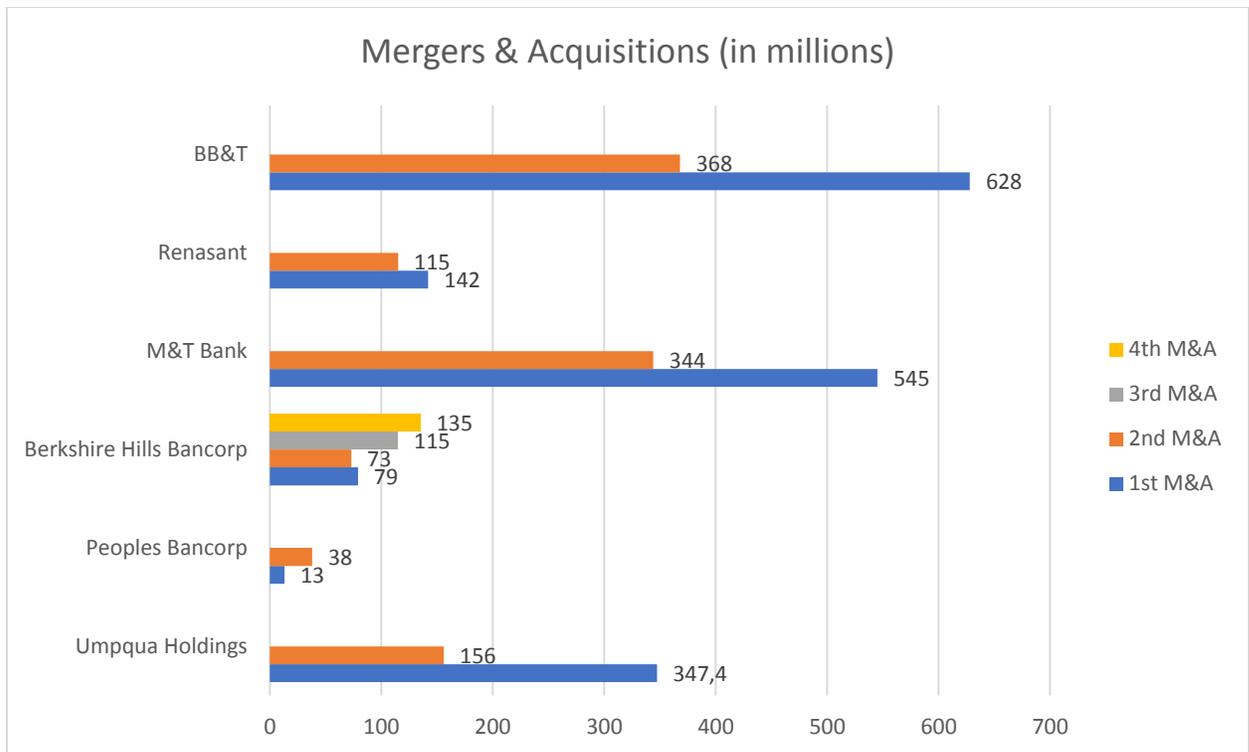
Figure 6: Prior M&A transaction during 2004-2014

3.2 Methodology

Event study methodology is a statistical tool that investigates the effect of an event on a dependent variable, most of the times on the share price of a company. Basically, we are looking at changes in the share prices around the event date that are beyond expectation, due to an announcement. The method is used to study whether the announcement of a M&A is valuable. Based on the assumption that the market is effective, which means that the share prices reflect the discounted cash flows. Moreover, the assumption that the investors have a rational behavior and own all the available information, to observe results in the short term. When the event is completed, this study helps to assess the difference between normal returns and realized ones, referred to as the abnormal returns. The level of abnormal returns represents the impact of an announcement in the wealth of the firm. Thus, the event study methodology can be simplified into 3 steps.

1) Identify the event, which in this case is the research about the impact of an announcement in the M&A transactions, in the US banking sector.
2) Specify a "benchmark" model.
3) Calculate and analyze abnormal returns and average abnormal returns around the event date.

Identifying as the event date the actual date that the transaction of M&A completed, wouldn't yield meaningful results. The takeover is usually announced a long time before, and possible changes in the value of the firms should already be reflected in the stock price. It is important to check the announcement date, where the takeover planes become public. The following steps lead to the calculation of abnormal returns.

1) Capture the announcement date of the M&A from Thomson Eikon.
2) Calculate returns of each Bank.
3) Obtain the price index S&P 500 Composite from DataStream and calculate returns.
4) Estimate the anticipated Abnormal Returns for several bidder banking firms.
5) Estimate the bidder's Average Abnormal Returns and Cumulative Abnormal returns for the 56 mergers through realized and normal returns, around the announcement dates.
6) Check the statistical significance of Average Abnormal Returns (AAR) and Cumulative Average Abnormal returns (CAAR) using the statistical test T-statistic, in different combinations of time periods around the event date.
7) Time series and Cross-sectional Regression analysis to determine how the independent variables affect the dependent variable (CAR).

Event Study Benchmark Models

The implementation of the models involves the definition of the estimation period and the event period. The first one is to provide an estimation about the parameters and second is to calculate abnormal returns, based on the estimated parameters. Note that the estimation period is less than the forecast period.

Market Model

A statistical model connecting the returns of the common stock to the market returns. Assume that security returns follow a single factor model. For any common stock the market model is

$$R_{jt} = \alpha_j + \beta_j R_{mt} + \varepsilon_{jt}$$

Where

- R_{jt} is the rate of return of the common stock of the jth firm on day t.
- R_{mt} is the rate of return of a market index on day t.
- ε_{jt} is a random variable that, by construction, must have an expected value of zero, and is assumed to be uncorrelated with R_{mt}, uncorrelated with R_{kt} for k ≠ j, not autocorrelated, and homoscedastic.
- β_j is a parameter that measures the sensitivity of R_{jt} to the market index.

Market Model's Abnormal Returns

The abnormal return (or prediction error) for the common stock of the jth firm on day t is

$$A_{jt} = R_{jt} - \left(\hat{\alpha}_j + \hat{\beta}_j R_{mt} \right)$$

Where the coefficient

- $\hat{\alpha}_j$ is the estimation of a_j in ordinary least squares method (OLS).
- $\hat{\beta}_j$ is the estimation of β_j in ordinary least squares method (OLS).

Market Model's average Abnormal Returns

The average abnormal return (or average prediction error) ARR_t is the sample mean

$$ARR_t = \frac{\sum_{j=1}^{N} A_{jt}}{N}$$

Where

- t is defined in trading days relative to the event date.

Market Model's cumulative average Abnormal Returns

Over an interval of two or more trading days beginning with day T_1, and ending with T_2, the cumulative average abnormal return is

$$CAAR_{T1,T2} = \frac{1}{N} \sum_{j=1}^{N} \sum_{t=T1}^{T2} A_{jt}$$

Market model with Scholes-Williams beta estimation

The Scholes-Williams beta estimator is

$$\hat{\beta}_j^* = \frac{\hat{\beta}_j^- + \hat{\beta}_j + \hat{\beta}_j^+}{1 + 2\hat{\rho}_m}$$

Where

- $\hat{\beta}_j^-$ is the OLS slope estimate from the simple linear regression of R_{jt} on R_{mt+1} .
- $\hat{\rho}_m$ is the estimated first-order autocorrelation of R_m.

The intercept estimation

As in OLS, the intercept estimator forces the estimated regression line through the sample mean

$$\hat{\alpha}_j^* = \overline{R_{JEST}} - \hat{\beta}_j^* \overline{R_{mEST}}$$

Where

- $\overline{R_{JEST}}$ is the mean return of stock j over the estimation period.
- $\overline{R_{mEST}}$ is the mean market return over the estimation period.

Market Model with GARCH estimation

GARCH is a heteroscedastic model where the variance of the disturbance term depends on the fluctuation of the corresponding term in the previous period. According to GARCH

$$h_{jt} = \omega_j + \delta_j h_{jt-1} + \gamma_j \varepsilon_{jt-1}^2$$

Where

$$\omega_j > 0, \gamma_j > 0, \delta_j > 0 \ \kappa\alpha\iota \ \gamma_j + \delta_j < 1$$

Fama-French three-factor Model

Is a return-generating process using a separate estimation period. The model is

$$R_{jt} = a + \beta_\xi R_{mt} + s_j SMB_t + h_j HML_t + \varepsilon_{jt}$$

Where

- R_{jt} is the rate of return of the common stock of the jth firm on day t.
- R_{mt} is the rate of return of a market index on day t.
- SMB_t is the average return on small market-capitalization portfolios minus average return on three large market-capitalization portfolios.
- HML_t is the average return on two high book-to-market equity portfolios minus the average return on two low book-to-market equity portfolios.
- ε_{jt} is a random variable that, by construction, must have an expected value of zero, and is assumed to be uncorrelated with R_{mt}, uncorrelated with R_{kt} for k ≠ j, not autocorrelated, and homoscedastic.

Fama-French's three-factor Model Abnormal Returns

The abnormal return (or prediction error) for the common stock of the jth company on day t, is

$$A_{jt} = R_{jt} - (\hat{a}_j + \hat{\beta}_j R_{mt} + \hat{s}_j SMB_t + \hat{h}_j HML_t)$$

Where the coefficients $\hat{a}_j$, $\hat{\beta}_j$, $\hat{s}_j$ and $\hat{h}_j$ are ordinary east squares estimates of a_j, β_j, s_j and h_j. The average abnormal return and cumulative abnormal return are equivalent to those defined in the market model section above.

Fama-French-momentum four-factor model

The Fama-French three-factor model, augmented by the momentum factor as suggested by Carhart (1997), as the return-generating process using a separate estimation period. The model is

$$R_{jt} = a + \beta_j R_{mt} + s_j SMB_t + h_j HML_t + u_j UMD_t + \varepsilon_{jt}$$

Where

- R_{jt} is the rate of return of the common stock of the jth firm on day t.
- R_{mt} is the rate of return of a market index on day t.
- SMB_t is the average return on small market-capitalization portfolios minus average return on three large market-capitalization portfolios.
- HML_t is the average return on two high book-to-market equity portfolios minus the average return on two low book-to-market equity portfolios.
- UMD_t is the average return on two high prior return portfolios minus the average return on two low prior return portfolios.
- ε_{jt} is a random variable that, by construction, must have an expected value of zero, and is assumed to be uncorrelated with R_{mt}, uncorrelated with R_{kt} for $k \neq j$, not autocorrelated, and homoscedastic.
- β_j is a parameter that measures the sensitivity of R_{jt} to the excess return on the market index.
- s_j measures the sensitivity of R_{jt} to the difference between small and large capitalization stock returns.
- h_j measures the sensitivity of R_{jt} to the difference between value and growth stock returns.
- u_j measures the sensitivity of R_{jt} to the difference high prior return stock returns and low prior return stock returns.

Fama-French's-momentum four-factor Model Abnormal Returns

The abnormal return (or prediction error) for the common stock of the jth company on day t, is

$$A_{jt} = R_{jt} - (\hat{a}_j + \hat{\beta}_j R_{mt} + \hat{s}_j SMB_t + \hat{h}_j HML_t + \hat{u}_j UMD_t)$$

Where the coefficients $\hat{a}_j$, $\hat{\beta}_j$, $\hat{s}_j$, $\hat{h}_j$ and $\hat{u}_j$ are ordinary least squares estimates of a_j, β_j, s_j, h_j and u_j. The average abnormal return and cumulative abnormal return are equivalent to those defined in the market model section above.

Market Adjusted Returns Model

Market adjusted returns are computed by substracting the observed return on the market index for day t, R_{mt}, from the rate of return of the common stock of the jth firm on day t

$$A_{jt} = R_{jt} - R_{mt}$$

The average abnormal return and cumulative abnormal return are equivalent to those defined in the market model section above.

The statistical significance tests use two hypotheses. The zero hypothesis is rejected when the results of the statistical significance tests exceed the critical value. This value is determined due to the statistical significance level, either 1%, 5% or 10%.

Time-series standard deviation test

Also called ''crude dependence adjustment'' test. Unlike the standardized abnormal test, the time series standard deviation test uses a single variance estimate for the entire portfolio. Therefore, the time series standard deviation test does not take account of unequal return variances across securities. On the other hand, it avoids the potential problem of cross-sectional correlation of security returns. The variance of ARR_t is

$$\hat{\sigma}^2_{AAR} = \frac{\sum_{t=E1}^{E2}(AAR_t - \overline{AAR})^2}{M-2}$$

➢ Where the market model parameters are estimated over the estimation period of M= E_2- E_1 +1 days and

$$\overline{AAR} = \frac{\sum_{t=E1}^{E2} AAR_t}{M}$$

➢ The portfolio test statistic for day t in event time is

$$t = \frac{AAR_t}{\hat{\sigma}_{AAR}}$$

➢ Assuming time-series independence, the test statistic is

$$t = \frac{CAAR_t}{(T_2 - T_1 + 1)^{\frac{1}{2}}\hat{\sigma}_{AAR}}$$

Cross-sectional Standard Deviation test

The portfolio test-statistic for day t in event time is

$$t = \frac{AAR_t}{\hat{\sigma}_{AAR}\Big/\sqrt{N}}$$

Where

$$\hat{\sigma}^2_{AAR} = \frac{1}{N-1}\sum_{i=1}^{N}\left(A_{it} - \frac{1}{N}\sum_{j=1}^{N}A_{jt}\right)^2$$

The estimated variance of $CAAR_{T1,T2}$ is

$$\hat{\sigma}^2_{CAAR_{T1,T2}} = \frac{1}{N-1}\sum_{i=1}^{N}\left(CAR_{i,T1,T2} - \frac{1}{N}\sum_{j=1}^{N}CAR_{j,T1,T2}\right)^2$$

The test-statistic for $CAAR_{T1,T2}$ is

$$t_{CAAR} = \frac{CAAR_{T1T2}}{\hat{\sigma}_{CAAR_{T1T2}}\Big/\sqrt{N}}$$

<u>Cross-sectional regression variables</u>

Several empirical studies attempted to analyze what drives the bidder banks to acquire target banks. An announcement of a M&A transaction affects the share prices around the event date. The OLS method provides the best way to analyze the changes in the share prices, and this is reflected to the abnormal returns. As a dependent variable we use Cumulative Average Abnormal Returns (CAAR) and as independent variables, that will help the financial analysis, the followings:

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Return on Equity

Return on Equity (ROE) is the amount of net income returned as a percentage of the shareholders equity. ROE measures a corporation's profitability, revealing how much profit is generated by a company depending on the money invested by shareholders. It is calculated as:

$$\text{Return on Equity} = \frac{Net\ Income}{Shareholder's\ Equity}$$

- Net income is for the full fiscal year, before dividends paid to common stock holders, but after dividends to preferred stock.
- Shareholder's equity does not include preferred shares.

Return on Assets

Return on Assets (ROA) is an indicator of how profitable is a company, based on its total assets. ROA gives a manager, investor or analyst an idea about how efficient is the company's management, using the assets to generate earnings. Return on Assets is displayed as:

$$\textbf{Return on Assets} = \frac{Net\ Income}{Total\ Assets}$$

- Net income is for the full fiscal year, before dividends paid to common stock holders, but after dividends to preferred stock.

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Earnings to Price

Earnings to Price (E/P) is a measure of valuation in order to determine what someone is willing to pay for every single amount of dollars of Earnings per Share. Stock prices follow the company's earnings over a long-term period. The higher the Earnings to Price ratio, the better it is for the company. Earnings per share (EPS) is the portion of a company's profit allocated to each outstanding share of common stock. Earnings per share serves as an indicator of a company's profitability. EPS is calculated as:

$$\textbf{Earnings to Price} = \frac{Earnings\ per\ Share}{Price}$$

Book to Market

Book to Market is a ratio used to find the value of a company by comparing the book value of the firm to its market value. Book Value is calculated by the firm's historical cost, or accounting value. Market value is determined is the stock market through market capitalization.

Book to Market $= \dfrac{Book\ value\ of\ Firm}{Market\ Value\ of\ Firm}$

Dividend Yield

Dividend Yield is a financial ratio that indicates how much a company pays out in dividends each year in relation with its share price. Dividend yield can be calculated by dividing the dollar value of dividends per share, paid in a year, of stock held, by the dollar value of one share of stock. The formula may be represented as follows:

Dividend Yield $= \dfrac{Annual\ Dividends\ per\ Share}{Price\ per\ Share}$

Yields for a current year are often estimated using the previous year's dividend yield or by taking the latest quarterly yield, multiplying by 4 (adjusting for seasonality) and dividing by the current share price.

Firm Size

Firm Size is an important variable in M&A's, as most of the banks tend to increase their firm and take advantage of new opportunities and the advantages that arise. It is measured as the logarithm of total assets at the end of the previous year from the year of the fulfillment of the M&A.

Firm size $= Ln \ (Total \ Assets)$

_____

Leverage

A Leverage ratio is one of several financial measurements that look at how much capital comes in the form of debt, or assesses the ability of a company to meet its financial obligations. The leverage ratio is very important given that companies rely on a mixture of equity and debt to finance their operations, and knowing the amount of debt held by a company to evaluate if its debts are payable as they come due. In this survey, we use the leverage as a debt ratio, simply dividing the firm's Total Liabilities by its Total Assets.

Leverage= $\dfrac{Total \ Liabilities}{Total \ Assets}$

A figure of 0.5 or less is ideal. It should be no more than half of the firm's assets that should be financed by loans. Many investors tolerate significantly higher ratios.

Tobin's Q

Tobin's Q ratio is devised by James Tobin of Yale University, who hypothesized that the combined market value of all the companies on the stock market should be about equal to their replacement costs. The Q ratio is calculated as the market value of a company adding the total debt divided by the replacement value of the firm's assets. *

$$\text{Q ratio} = \frac{Total\ Market\ Value\ of\ Firm}{Total\ Asset\ Value}$$

A low Q ratio, between 0 and 1, means that the cost to replace a firm's assets is greater than the value of its stock. This implies that the stock is <u>undervalued</u>. On the other side, a high Q ratio, greater than 1, implies that the stock is <u>overvalued</u>. This measure of stock valuation is leading the investment decisions in Tobin's model.

State Dummy

According to DeLong (2001), when both companies are in the same state, the market reacts more approvingly to M&A's. State Dummy is a binary variable that equals 1 if the firms in the transaction are in the same state, and 0 otherwise.

State of Transaction	Value
Same State	1
Different State	0

MA Dummy

As already mentioned, companies tend to grow through M&A transactions. In particular, some of them had a prior merger or acquisition experience, in a successful way. That's why they choose again this form of expanding, because they believe that these results will repeat again. MA is a binary variable that equals 1 if the company has done a M&A transaction more than once, in the decade between 2004-2014, and 0 otherwise.

Merger or Acquisition Transaction	Value
More than one	1
One	0

Cross-sectional regression analysis

Cross-sectional regression analyzes in detail the abnormal returns when an M&A is announced. Regressions are performed to estimate which independent variable best explains the dependent one, which is the Cumulative Abnormal Return (CAR), using the Ordinary Least Squares method. OLS is optimal when there is no heteroskedasticity or autocorrelation and is applied when the factors are exogenous and there is no multicollinearity. For the implementation of the OLS, some assumptions need to be taken into consideration. If the following assumptions are applied to the data, it can be proved by the Gauss-Markov theorem that the estimates of OLS method are the best, most effective, linear unbiased estimators of the true coefficients (BLUE). Correlation coefficients indicate linear relationship among sets of variables. To control for heteroskedasticity, we estimate standard errors following the White test, from the E-views program. As heteroscedasticity is presented, we prepare the regression using Huber-white covariance method, to give us trustworthy results about p-values and the estimates. The assumptions are the following:

1) The relation between dependent and independent is linear in the true coefficients.
2) The values of the independent variable are non-stochastic.
3) The disturbance term has, under condition, zero mean.
4) Constant Variance.
5) No Autocorrelation between disturbance terms. In our case, you use cross-sectional data and as a result the autocorrelation doesn't exist.
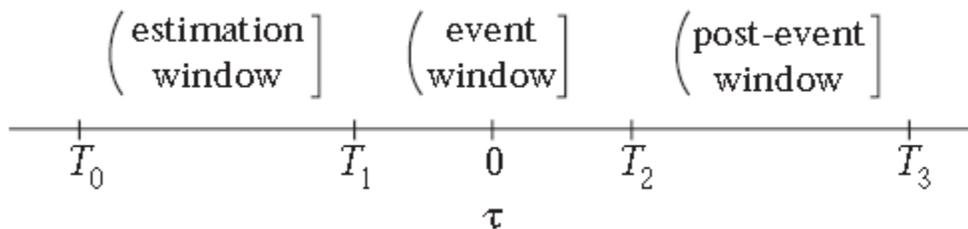
Figure 7: Event days around the announcement of a M&A

Regression model

$$CAR = a_0 + b_1 * ROE_i + b_2 * ROA_i + b_3 * LVRAGE_i + b_4 * EPS_i + b_5 * BOOKTM_i + b_6 * DIVYLD_i + b_7 * TOBINSQ_i + b_8 * FIRMSIZE_i + b_9 * DSTATE_i + b_{10} * DMA_i + \varepsilon$$

CHAPTER 4: RESULTS ANALYSIS

4.1 Average Abnormal Returns

Researchers on a timely basis try to answer whether an M&A transaction create value for the shareholders of the companies involved. Relevant studies in the US and international data, point out that M&A favor the target company's, as they achieve abnormal returns mainly due to the premium they get to complete the deal. On the contrary, the shareholders of the acquiring companies report negative abnormal returns, or sometimes positive but not statistically significant. Basically, this can be described as a wealth transfer, from the shareholders of the bidder company to the target one's. To estimate the share price reaction in the days around the announcement of the M&A, we calculated Average Abnormal Returns and Cumulative Average Abnormal Returns. Starting with daily prices, converted into returns and an estimation period of 120 days before and 15 days after the announcement of the event. The testing period is 10 days before and after the announcement, setting 11 different day combinations around the announcement date in this test period. Subsequently, we checked implementing the t-statistic test, assuming that the announcement of an M&A does not create abnormal returns as the zero hypothesis, through the standard deviation of the time series and cross-sectional data. (The symbols *,** and *** denote statistical significance at the 10%, 5% and 1% levels respectively)

Acquirer Companies			
event days	AARt	cross-sectional	time series
-10	0.14%	0.73	0.72
-9	-0.21%	-0.83	-1.04
-8	-0.46%	-2.43**	-2.31**
-7	0.15%	0.45	0.74
-6	0.27%	1.65	1.38
-5	0.07%	0.43	0.36
-4	-0.09%	-0.44	-0.45
-3	-0.39%	-1.69*	-2.00**
-2	0.02%	0.13	0.12
-1	0.08%	0.37	0.41
0	**-0.02%**	**-0.04**	**-0.09**
1	-0.16%	-0.39	-0.8
2	0.66%	2.71***	3.33***
3	-0.14%	-0.84	-0.71
4	-0.38%	-1.74*	-1.93*
5	-0.06%	-0.32	-0.28
6	0.20%	1.11	1.03
7	0.07%	0.34	0.36
8	-0.18%	-0.6	-0.92
9	0.18%	0.66	0.91
10	0.06%	0.37	0.3
***p=0.01, **p=0.05, *p=0.1			

Table 3: t-stat in CS and TS data for Average Abnormal Returns

According to the Bibliography, for the bidder companies, we expect no positive average abnormal returns, but neutral and negative average abnormal returns. At the announcement day the average abnormal return is negative -0,018%, statistically insignificant for both cross-sectional and time-series data and very close to zero. Two days after the announcement, there is a positive average abnormal return of 0,658% and statistically significant in 1% level in both cross-sectional and time series data.

4.2 Cumulative Average Abnormal Returns

In the following table there are the results for CAAR and the statistical significance t-test for both cross-sectional and time series data for 56 acquirer companies for the different combinations in the days around the announcement.

Bidders			
event window	CAARt %	Std CS test	Std TS test
(0,+1)	-0.177%	-0.307	-0.634
(-1,0)	0.062%	0.130	0.223
(0,+2)	0.481%	0.793	1.407
(-2,0)	0.085%	1.000	0.250
(+1,+2)	**0.500%**	**1.162**	**1.789****
(-1,+1)	-0.096%	-0.161	-0.282
(-1,+2)	0.562%	0.945	1.423
(-2,+2)	0.585%	0.984	1.325
(-2,+1)	-0.073%	-0.124	-0.185
(-5,+5)	-0.404%	-0.565	-0.616
(-10,+10)	-0.174%	-0.182	-0.192

Table 4: t-stat in CS and TS data for Cumulative Average Abnormal Returns

The bidder companies have statistically insignificant cumulative average abnormal returns. Observing the time combinations, we find that Cumulative Average Abnormal Returns are either negative or very close to zero, except (+1,+2). When the companies make offers to acquire, they usually don't have profits. These results are consistent with previous studies in the European banking industry, such as those of Cybo-Ottone and Murgia (2000), which also resulted in negative and statistically insignificant returns for the acquiring banks, while agreeing also with of Ismail and Davidson (2005), who resulted in insignificant but slightly positive returns for the acquiring banks. Shah and Arora (2014) stated that cumulative average abnormal returns are statistically insignificant for bidder firms in the combinations around the announcement day, which is in line with our results.

4.3 Regression analysis

Descriptive Statistics

To analyze the abnormal returns, we use the descriptive statistics from E-views.

Variable	Obs	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
DIVIDEND_YIELD	56	0.0282	0.0261	0.0640	0.0000	0.0147	0.4622	2.6421
DMA	56	0.2143	0.0000	1.0000	0.0000	0.4140	1.3926	2.9394
DSTATE	56	0.6250	1.0000	1.0000	0.0000	0.4885	-0.5164	1.2667
EARNINGS_TO_PRICE	56	0.0632	0.0685	0.1487	-0.2232	0.0482	-3.7700	23.4878
FIRM_SIZE	56	15.1260	15.0913	19.0251	13.1785	1.3206	0.7085	3.2810
LEVERAGE	56	0.8864	0.8899	0.9255	0.7600	0.0271	-2.1323	10.4300
ROA	56	0.0135	0.0139	0.0239	-0.0037	0.0046	-0.9230	5.5256
ROE	56	0.0821	0.0856	0.1600	-0.1614	0.0483	-2.3754	12.9996
TOBIN_S_Q	56	0.2313	0.2172	0.4081	0.1246	0.0638	0.7403	3.1553
BTM	56	0.8278	0.8029	1.3831	0.3166	0.2107	0.3945	3.5104

Table 5: Descriptive Statistics

The main objective of the regression analysis is to target the independent variables that best explain the dependent one. Initially, we construct a correlation table in the E-views program to notice the degree of correlation between the independent variables, resulting that two correlated variables won't be inserted simultaneously in the regression models.

	DIVIDEND_YIELD	DMA	DSTATE	EARNINGS_TO_PRICE	FIRM_SIZE	LEVERAGE	ROA	ROE	TOBIN_S_Q	BTM
DIVIDEND_YIELD	1									
DMA	0.1731	1.0000								
DSTATE	-0.0874	-0.1348	1.0000							
EARNINGS_TO_PRICE	-0.0824	-0.2610	0.1856	1.0000						
FIRM_SIZE	0.0901	0.6059	-0.3368	-0.2973	1.0000					
LEVERAGE	-0.0434	-0.2631	0.3352	0.2397	-0.2354	1.0000				
ROA	0.2650	-0.0351	-0.0660	0.3080	0.0573	0.1397	1.0000			
ROE	-0.0182	-0.3276	0.1667	**0.8931**	-0.2784	0.3566	**0.5439**	1.0000		
TOBIN_S_Q	0.4734	0.1625	-0.0661	-0.4385	0.2000	-0.1996	0.0302	-0.3068	1.0000	
BTM	0.1048	0.2456	-0.0592	-0.1479	0.0146	-0.1188	-0.3241	-0.4767	-0.0760	1.0000

Table 6: Correlation Table

We notice that Earnings to Price and ROE are highly correlated, approximately 0,9. As they both examine for profitability, they won't be together in the same model. ROE and ROA are correlated in 54% and we avoid using them simultaneously in the model. The other variables correlation isn't a deterring factor from using different combinations in the models.

4.4 Cross-sectional regression for CAR(+1,+2)

Method: Least Squares

Sample: 1 56

Included obs: 56

White heteroskedasticity-consistent standard errors & covariance

	Dependent Variable: CAR(+1,+2)				
	Bidders				
Variable	[1]	[2]	[3]	[4]	[5]
C	0.181	0.031081	0.051*	0.055262**	0.05465***
	[0.3098]	[0.6149]	[0.0575]	[0.0275]	[0.0093]
ROE	-0.196*	-0.21555*		-0.21468*	-0.22923**
	[0.0993]	[0.0769]		[0.0875]	[0.0213]
Tobin's_Q	-0.12	-0.11789	-0.0737	-0.11526	-0.13741*
	[0.1334]	[0.1522]	[0.3840]	[0.1005]	[0.0868]
DMA	-0.021**	-0.02271**	-0.0139*	-0.02014**	-0.02089*
	[0.0240]	[0.0297]	[0.0920]	[0.0319]	[0.0586]
Leverage	-0.144				
	[0.4698]				
ROA			-1.82225*		
			[0.10003]		
BtM					
SIZE		0.001569			
		[0.6697]			
E_P			-0.0216		
			0.68422		
Div_Yld					0.191955
					[0.5631]
Dstate				-0.00268	
				[0.7511]	
R squared	15,5%	14,5%	12,8%	14,4%	14,8%

The symbols *, **, and *** denote statistical significance at the 0.10, 0.05 and 0.01 levels respectively.

Table 7:CS regression for CAR(+1,+2)

The dependent variable CAR(+1,+2) is the cumulative abnormal return of the first and the second day after the announcement day (0). We use Huber-White method for covariance coefficient, as under the heteroscedasticity deals with the problem of trustworthy results for the p-values and the coefficients. In the analysis, earnings to price and is statistically insignificant with p-value close to 1, and therefore this variable is pulled off from the models. At the same time, ROA in all combinations in regression is either the only statistical significant variable, or none of the whole equation. As it is correlated with ROE, we pulled this variable off the models, to achieve a better and more efficient combination.

In the first model, R squared is 15.5%. Contains the independent variables Return on Equity (ROE), Tobin's Q, the dummy of the previous experience in MA and leverage. ROE is statistically significant at 10% level. An increase of ROE by one unit means a decrease of approximately **0.2** for the dependent variable. Moreover, DMA is statistically significant at 5%, while Leverage is statistically insignificant.

In the second model, R squared is 14.5%. After the non-significant presence of leverage as an independent variable, it is pulled off and firm size takes place instead, compared with the previous model. DMA is statistically significant at a 5% level, showing that it best explains the changes in the Cumulative Abnormal Returns. Additionally, ROE is negative and statistically significant at 10% level, in contrast with Tobin's Q and firm size.

In the third model, the R squared is 12,8%. In comparison with the second model, ROE and firm size removed, and ROA and book to market take their place in the equation. ROA (almost) and DMA are statistically significant at 10% each while Tobin's Q and E/P are statistically insignificant. An increase in ROA results to a decrease of CAR by **1.82**.

In Model 4, we enter the Dummy of state, which proved statistically insignificant. The R squared is 14,4%. DMA and ROE are statistically significant at 5% and 10% respectively, while Tobin's Q is almost significant (p-value of 0,10). An increase in Tobin's Q and DMA means a decrease in CAR for **11%** and **2%** at each unit.

Model 5 has R squared 14,8%. Note that ROE, DMA and Tobin's Q are statistically significant at 5%, 10% and 10% respectively, while the dividend yield is statistically insignificant, showing inability to interpret the dependent variable effectively.

4.5 Testing for Heteroscedasticity

Heteroskedasticity, in statistics, is when the standard deviations of a variable, monitored over a specific amount of time, are non-constant. Heteroskedasticity often arises in a conditional or unconditional form. The first one, identifies non-constant volatility when future periods of high and low volatility cannot be identified. The second one is used when future periods of high and low volatility can be identified. The most widespread test for heteroskedasticity and specification bias, is an estimator for consistent standard errors. The test is about comparing p-value with the level of statistical significance α, in our case 0.01, 0.05 and 0.10. If p-value is higher (in all 10 models is slightly less than 1) then we accept the null hypothesis, and reject the heteroskedasticity. We calculated the White test and the results are in the table:

White test						
		CAR(+1,+2)				
	independent variables	Prob. Chi-Square	Obs*R-squared	x^2		
				1%	5%	10%
Model 1	13	0.1743	17.575	4.107	5.892	7.042
Model 2	13	0.5781	11.3908	4.107	5.892	7.042
Model 3	13	0.0103	27.5919	4.66	5.892	7.042
Model 4	12	0.4953	11.3962	3.571	5.226	6.304
Model 5	13	0.5644	11.5549	4.66	5.892	7.042

Table 8: White test for Heteroscedasticity

We reject the null hypothesis of homoscedasticity, when observations* R-squared are higher than the critical value of the x^2 distribution. In all models the observations* R-squared overcome the critical value of the chi-square distribution.

Dealing with Heteroscedasticity

Heteroscedasticity does not result in biased parameter estimates. Under the OLS method, the estimates are no longer BLUE. OLS does not provide the estimate with the smallest variance. Depending on the nature of the heteroscedasticity, significance tests can be too high or too low. In addition, standard errors are biased when heteroscedasticity is present. This leads to bias in test statistics and confidence intervals. To deal with the problem, at first, we specified the model again, using other variables and combinations, but the results were the same. Also, we could use logarithm in all the variables but this requires the data to be only positive, which in this case does not exist. The answer is to complete the regression in E-views using the Huber-White method for covariance coefficient, which deals with the heteroscedasticity problem, transforming the standard errors and p-values to trustworthy, in order to get efficient results.

4.6 Results analysis

The existence of abnormal returns in the share prices affected by an announcement of a M&A transaction caused the interest of many researchers. In this survey the subject is examined in the bidder companies point of view. The results from the multiple regressions showed that Return on Equity, Tobin's Q, DMA and Return on Assets (only once but almost statistically significant) best describe the cumulative abnormal returns among all the other independent variables used in the models. The event window is from the next day of the announcement till the third one, as it was the only statistically significant time period. We came up with the result that when Return on Equity, Return on Assets, the Dummy of previous M&A experience and Tobin's Q raise by one unit, then Cumulative Abnormal Return decline. At next, the results of the researchers who have already investigated the issue, are presented and compared with the outcome of this study.

Return on Equity (ROE). There are mixed results about this independent variable and the effect on the Cumulative Abnormal Return. As Hagendorff, Collins and Keasey (2008) point out, acquisitions addressed to profitable banks with an increased index of ROE tend to show higher cumulative abnormal returns than the rest. In contrast, Asimakopoulos and Athanasoglou (2013) claim that ROE has negative, statistically significant effect on Cumulative abnormal return, in accord with the results of this survey. According to Campa and Hernando (2006) and Beitel, Schiereck and Wahrenburg (2004) there isn't any causal relationship between ROE and CAR. This does not coincide with this survey, since the ROE is statistically significant and effectively interprets the dependent variable, proving that profitability one of the most important factors leading to M&A's.

Return on Assets (ROA). According to Ismail and Davidson (2007) and Palia (1993) the Return on Assets variable is positive and statistically significant, in line with our results, as ROA has located in model 3 the rearrangements in the dependent variable around the announcement of the event, but with negative relation to the dependent variable. To avoid any correlation problems, we avoid entering ROE and ROA simultaneously in the 5 models in CAR (+1, +2).

Tobin's Q. Tobin's Q ratio is extensively used in the financial literature as a proxy for future investment opportunities. The results of this survey are in accord with Servaes (1991), who used the q ratio to examine the relationship between returns to shareholders of bidders and the market valuation. He showed that bidders with high Q ratios have statistically significant negative abnormal returns when they engage in a takeover. If Q is interpreted as a measure of managerial performance, in this survey there is a negative statistically significant effect in the Cumulative Abnormal Return.

MA dummy. Gupta and Misra (2007) showed a statistically insignificant relationship between the Cumulative Abnormal Returns and this binary variable, which is in contrast with this survey, as the MA dummy effectively interprets the dependent variable, proving that the previous experience in M&A's is an important factor to the next transaction.

State Dummy. The binary variable of State has positive statistically insignificant influence in CAR, due to Gupta and Misra (2007) and Becher (2000). This comes in line with our results, because in all models the dummy of state was statistically insignificant.

Earnings to Price (E/P). At their study, Beitel, Schiereck and Wahrenburg (2004) inferred that this variable doesn't have a statistical significance in the making of a successful M&A transaction. This conclusion corresponds also to this survey, as this independent variable failed to define the turnarounds of the Cumulative Abnormal Return in all models.

Book to Market (BtM). Al-Sharks and Hassan (2010) showed that Book to Market is statistically insignificant and has no effect on the CAR around the announcement dates, agreeing with the results of this research.

Firm size. The results on the Firm size variable and the effect on the Cumulative Abnormal Return are in accord with this survey. Al-Sharks and Hassan (2010), Ismail and Davidson (2007) and Palia (1993) recommend there is a positive but statistically insignificant relationship between Firm Size and CAR. Cybo-Ottone and Murgia (2000), and Gupta, Misra (2007) showed that the firm size is statistically insignificant. In contrast, Asimakopoulos and Athanasoglou (2013) and Beitel, Schiereck and Wahrenburg (2004) stated that Firm Size has negative statistically significant effect on the CAR.

Dividend Yield. Dividend Yield in our results didn't have an impact in specifying the changes in the Cumulative Abnormal Return around the announcement day. The study from Fracassi (2008) showed that dividend yield is statistically significant and positive, which comes in contrast with our results, as this variable was statistically insignificant in the regressions and in the model 5.

Leverage. Hatem (2015) found that leverage has positive and statistically insignificant ratio, which comes in line with the results of this survey, as Leverage was statistically insignificant.

CHAPTER 5: CONCLUSION

The purpose of this exercise was to analyze the performance of the M&A's in the US banking sector. In particular, the investors' reaction to the announcement of an M&A transaction and how this is reflected in the share prices. Also, we try to define the determinants that contributed to the process, using the adjusted market model to test the average abnormal returns in the period of 10 days before and 10 days after the event date. Additionally, the cumulative average abnormal returns of the acquiring banks in 10 different combinations around the announcement of the event. The acquiring banks show negative and statistically insignificant average abnormal return at the announcement day, and negative or close to 0, cumulative average abnormal returns, except the event window (+1,+2). To determine the factors that contributed to a successful M&A, we use the regression analysis for the bidder bank based on the Least Squares Method (OLS).The dependent variable is the cumulative abnormal return and the independent are Return on Assets, Return on Equity, Leverage, Tobin's Q, Book to Market, Dividend Yield, Earnings to Price, Firm Size, and two binary variables, a dummy for the state and a dummy for the frequency of the M&A in the decade between December 2004 and December 2014. Initially, we conducted descriptive statistics and a correlation table, in E-views, to reveal the correlation between the independent variables. Then we summarize the time window for the dependent variable, CAR(+1,+2). There are 5 models for the dependent variable, releasing the independent variables of a very high correlation, or statistically insignificant, to achieve the best possible results. In the case of heteroscedasticity of our data, we conduct the regression process by choosing the Huber-White covariance method in E-views program, in order to get trustworthy results for the explanatory variables. Finally, we compared the results with the existing literature. In conclusion, we found that ROE, ROA, DMA and Tobin's Q best interpret the dependent variable, proving that M&A transactions depend mostly on the profitability, the previous experience in M&A's and whether the banks that take part in the agreement are undervalued or overvalued.

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APPENDIX

Table 1: Mergers and Acquisitions per year

	Acquirers	
Year	**Frequency**	**Percentage**
2005	0	0%
2006	0	0%
2007	1	1.78%
2008	1	1.78%
2009	2	3.57%
2010	5	8.92%
2011	1	1.78%
2012	11	19.64%
2013	15	26.78%
2014	20	35.71%
Total	**56**	**100%**

Table 2: Mergers and Acquisitions per state

Acquirers		
Nation	Frequency	Percentage
New Jersey	4	7.14%
Pennsylvania	8	14.28%
New York	4	7.14%
Maryland	2	3.57%
Virginia	6	10.71%
Mississipi	2	3.57%
California	7	12.50%
Indiana	2	3.57%
Massachusetts	3	5.36%
Connecticut	2	3.57%
Washington	2	3.57%
South Carolina	1	1.79%
Ohio	3	5.36%
Oregon	2	3.57%
Kentucky	1	1.79%
North Carolina	1	1.79%
Texas	2	3.57%
Louisiana	1	1.79%
Alaska	1	1.79%
Michigan	2	3.57%
Total	**56**	**100%**

Table 3: Banks with prior experience in Mergers and Acquisitions within the decade

	Umpqua Holdings	Peoples Bancorp	Berkshire Hills Bancorp	M&T Bank	Renasant	BB&T
1	347.4	13	79	545	142	628
2	156	38	73	344	115	368
3			115			
4			135			