

Bank Mergers and Acquisitions in Greece: The Financial Crisis and its Effect on Shareholder Wealth

Abstract

Purpose: The purpose of this paper is to investigate the wealth implications of bank mergers and acquisitions (M&As) in the unique Greek setting given the triple crisis phenomenon - banking, sovereign debt and economic crises – that prevailed after the global financial crisis.

Design/methodology/approach: The study examines bank M&As and bank transactions over the period from 1997 to 2018, as well as government-assisted M&As during the crisis. The wealth effects of bank M&As are assessed using both univariate and multivariate frameworks.

Findings: Findings show a neutral crisis effect on the valuation of M&As upon their announcement. However, we provide conclusive evidence that M&A completions are value-destroying events for acquiring banks during the crisis, far worse than in the pre-crisis period. Greek banks also fail to create value from government-assisted mergers. The results suggest that the financial stability and the prevention of further deepening of the Greek crisis with possible contagion effects were achieved at the expense of shareholders and taxpayers.

Originality/value: To our knowledge, this is the first study that examines the impact of the Greek triple crisis on the wealth effects of bank M&As and bank transactions. Also, the study provides first evidence with regard to the economic impact of government-assisted M&As in the European context.

Keywords Mergers and Acquisitions; Banks; Crisis

Paper type Research paper

1. Introduction

Over the past decades, the Greek banking sector has been going through an unprecedented level of consolidation through mergers and acquisitions (M&As) similar to that of the European banking sector. The main forces that fundamentally transformed the European banking industry since the 1990s were the economic integration within the Economic and Monetary Union (EMU), the creation of a single market for financial services and the introduction of the euro (for more, see Schoenmaker, 2015; Rughoo and Sarantis, 2014; Goddard *et al.*, 2007; Dermine, 2000). Technological innovations, financial globalization and further deregulation in the European Union underpinned this process of consolidation until the outbreak of the 2008 financial crisis (Altunbas and Marques, 2008). Since then, the European banking sector has undergone a rationalization process in light of the euro area crisis. According to the European Central Bank (ECB) the cumulative decline of banks between 2008 and 2016 reached 25%, while Greece, along with the Netherlands, Cyprus and Spain, recorded the largest relative decreases (ECB, 2017). In the wake of the global financial crisis, Greece faced a banking crisis from 2008 to 2012 and sovereign debt crises with its 2012 debt restructuring and the 2015 default to the International Monetary Fund (IMF) (Baron *et al.*, 2018; Laeven and Valencia, 2018). Reinhart and Rogoff (2014) assert that in Greece prevailed the twin crisis scenario, which had previously occurred in a number of advanced economy crises during the 1930s. The effects of the sovereign and banking crises spilled over to the real economy, resulting in a long recession whose only precedent is the Great Depression of 1929 (Muet, 2017). This situation caused a deep banking sector restructuring that resulted in a reduction in the number of banks to 18 in 2016 from 36 in 2008. At the end of 2016, market concentration (measured by the share of assets held by the five largest banks) reached 97% in Greece which was the highest ratio in the euro area (ECB, 2017).

While there is a well-documented strain of literature that examines the wealth effects of bank mergers in the pre-crisis period (for example, see Karamanos *et al.*, 2015; Tsangarakis *et al.*, 2013; Ekkayokkaya *et al.*, 2009; Hagendorff *et al.*, 2008; Campa and Hernando, 2006; Ismail and Davidson, 2005; Cybo-Ottone and Murgia, 2000), little is known about the economic impact of the merger activity that occurred during a prolonged period of economic contraction. Especially in Greece, the consolidation activity is of particular interest, in that it is initiated in a unique setting given a triple crisis phenomenon: banking, sovereign debt and economic crises. Therefore, it is essential to investigate the economic implications of such consolidation activity. For this reason, we initially examine two separate samples of M&As and transactions announced by Greek banks over the 1997-2018 period, which are

then divided into the pre-crisis (1997-2007) and the post-crisis (2008-2018) sub-periods. In line with previous studies (Ekkayokkaya *et al.*, 2009; Lepetit *et al.*, 2004; Cybo-Ottone and Murgia, 2000), we document mainly insignificant announcement period returns for the acquiring banks over the entire sample period. Also, comparing the results between the two sub-periods, we find a neutral crisis effect on the valuation of bank M&As and bank transactions upon their announcement. Our findings suggest that Greek banks neither create nor destroy shareholder value from the implementation of M&As and/or transactions across the entire sample period.

We next examine the abnormal returns upon the announcement of completion of M&As. Beltratti and Paladino (2013) assert that during a financial crisis the timing of market reaction is different, since investors are more cautious about the value of target firms and, thus, they anticipate the information of the due diligence process that is initiated at the announcement of a merger bid. Given the escalated economic uncertainty during the crisis in Greece, we expect investors to postpone repricing of shares upon the final outcome of an initial merger announcement. Therefore, the market is expected to react around the completion of M&As based on the results of the due diligence process and the economic and financial conditions. Our study contributes to the literature, examining the completion period returns to acquirers in the unique, triple crisis, setting that prevailed in Greece after 2008. We find that merger completions are value-destroying events for acquiring banks in the period during the crisis, far worse than the pre-crisis period. Our results suggest that Greek banks failed in their attempt to implement an effective due diligence process and to assess the dynamics prevailing in the economic landscape during the crisis.

The profound financial and economic crisis in Greece had severe implications for banks in terms of capital. More specifically, the increase in non-performing loans (NPLs) from 4.70% in 2008 to 36.65% in 2015 and to 45.57% in 2007 (World Bank, 2018) as a result of strict fiscal and reform measures under the EU/IMF financial assistance programmes, along with the restructuring of sovereign debt through the Private Sector Involvement (PSI) that resulted in a €37.7 billion loss for Greek banks (Bank of Greece, 2012), essentially wiped out the capital base of the banking system. A number of banks failed to cover the capital shortfalls and the ECB, following consultations with the Bank of Greece, withdrew the authorisation of these banks. In light of public interest, the Bank of Greece took immediate remedial actions, deciding the implementation of resolution measures on insolvent banks. In the context of the resolution process, the healthy - previously recapitalized - banks were eligible to submit bidding bids for the acquisition of the business of the banks under resolution. Considering the number of banks undergoing a resolution process along with the cost of this process [1], the Greek experience of restructuring through government-assisted mergers constitutes a special case in the EU. Ours is the first study to examine the wealth effects of government-assisted M&As on the acquiring banks in the European context. Prior evidence comes from the US banking sector, revealing mainly positive results for acquirers that are attributable to public subsidization or the underpricing of target banks' assets (Cowan and Salotti, 2015; Zhang, 2006; Bertin *et al.*, 1989; James and Wier, 1987). In contrast, we document highly negative abnormal returns for acquirers, which, once again, represents a failure of Greek banks to protect the interests of their shareholders during the crisis period. The results suggest that the achievement of financial stability has taken place at the expense of the shareholders of the better capitalized banks.

Our study is similar to those of Karamanos *et al.* (2015), Liargovas and Repousis (2011), Manasakis (2009), Vergos and Christopoulos (2008), Asimakopoulos *et al.* (2005) and Mylonidis and Kelnikola (2005) in investigating the wealth effects of bank mergers in Greece. However, our findings complement the above studies in two important ways. First, the examined samples in this study are considerably larger compared to samples in previous studies, including all M&As and transactions announced over the last two decades. Second, the sample period enables us to examine for the first time the impact of the triple crisis on the wealth effects of M&As. Such analysis is important to evaluate the use of funds, both private and public, injected in the banking system for recapitalization purposes during the crisis. This is also the first study that examines the hypothesis of positive completion returns suggested by Beltratti and Paladino (2013) in a different crisis framework compared to that prevailed in Europe over the period 2007-2010. Our results demonstrate that the nature of the crisis can lead to different results for acquiring banks. Another innovation of this study is that it shows that government-assisted mergers in the European context are value-diminishing transactions. This analysis helps assess the resolution process adopted by the Greek authorities in cooperation with the EU/IMF. Furthermore,

the results of the regression analysis highlight the significant role of certain bank-specific variables and deal characteristics in explaining the variance of bidder returns around M&A announcements. Banks with longer history and higher liquidity are in a better position to exploit economic benefits from M&A deals. In addition, geographically focused and horizontal transactions have a significant positive effect on acquirers' gains. One plausible interpretation could be that both factors provide banks the opportunity to achieve cost economies deriving from operational synergies, shared technology and better market awareness. Finally, in terms of experimental method used, our study contributes by checking the robustness of the findings with alternative model specifications that control for bank-specific variables and deal characteristics. Considering also the detrimental effect of uncertainty on firms' investment decisions (Bloom, 2009), we include in our analysis the Greek Banking Policy Uncertainty Index constructed by Hardouvelis *et al.* (2018). Previous studies find a positive and statistically significant relationship between economic policy uncertainty and acquirer shareholder value in the US (Nguyen and Phan, 2017; Bonaime *et al.*, 2016). However, we do not find a significant effect of uncertainty on acquirers' gains.

The remainder of the paper is organised as follows. Section 2 presents a review of the literature. Section 3 describes the data and methodology. Section 4 presents the empirical results and discusses the main findings. Section 5 concludes.

2. Literature review

The following paragraphs review the literature with regard to the economic impact of M&As on acquiring banks in Europe. As far as Greek banks are concerned, they have been either included in samples covering the European financial sector or analyzed separately.

2.1 Bidder returns

The progressive realisation of the EMU, the introduction of the Second Banking Coordination Directive and the creation of the EU intensified the consolidation of the financial industry and reinforced the universal character of the European banking system in the 1990s. A significant number of studies assess the wealth effects of bank mergers during that period, revealing either positive or insignificant abnormal returns for the European banks. More specifically, Rad and Van Beek (1999), examining 56 bidding banks from 1989 to 1996, reveal no statistically significant excess returns for acquirers. Cybo-Ottone and Murgia (2000) examine a sample of large deals (in excess of \$100mm) during the 1988-1997 period, presenting positive and statistically significant excess returns for the European bidder banks. Beitel and Schiereck (2001) and Beitel *et al.* (2004) utilize a similar sample to that of Cybo-Ottone and Murgia (2000), during an overlapping period, however they reach different conclusions. The former reveal mostly insignificant abnormal returns to bidders, while large deals and cross-border transactions seem to be particularly value-destroying. Beitel *et al.* (2004) address the underlying value creation factors in greater detail. Successful bidders in terms of higher returns are less active, pay in stocks and choose smaller and fast growing targets with bad relative efficiency measures. Lepetit *et al.* (2004) confirm the findings of Beitel and Schiereck (2001) and Beitel *et al.* (2004), considering a sample of 180 M&A deals between banks from 1991 to 2001. They find a significant positive market reaction for bidders in deals with cross-product diversification and geographic specialization. Ismail and Davidson (2005), examining 102 bank mergers from 1987 to 1999, calculate slightly positive and in many cases statistically significant bidder returns. Ekkayokkaya *et al.* (2009) analyse the announcement effect of 963 merger bids in European banking between 1990 and 2004. Banks that announce merger bids in the pre-euro era (1990–95) add significant value for their shareholders, while gains fall to insignificant levels thereafter.

The continuing deregulation and liberalization initiatives intended to promote the EMU and the introduction of the euro were primary driving forces for further consolidation in the financial industry. By the end of the 1990s, the volume and number of bank M&As surged. A number of studies focusing on that period fail to reach a consensus. Campa and Hernando (2006) analyze 172 deals that took place in the financial industry from 1998 to 2002, revealing significant negative excess returns for bidders. Cross-border and large deals generate higher excess returns to bidders compared to domestic and small ones. In contrast, Lensink and Maslennikova (2008) and Hagendorff *et al.* (2008) find significant positive abnormal returns for acquirers considering a sample of 75 and 53 M&As, respectively, during the period from 1996 to 2004. The former suggest that domestic diversifying and non-diversifying

transactions yield higher value gains for bidding banks compared to cross-border acquisitions, while the latter show that the value effects of product and geographic diversification are determined by the level of investor protection prevalent in the target country. Teplý *et al.* (2010) and Nnadi and Tanna (2013) examine ten years of M&A activity in the European banking sector starting from 1998 and 1997, respectively. The first study shows negative and statistically significant abnormal returns for bidders. The study concludes that cash-financed and small transactions are better awarded by the market, while it cannot draw any clear conclusion between domestic and cross-border deals. In contrast, Nnadi and Tanna (2013) assert that cross-border bank mergers are value-destroying transactions due to differences in regulatory and accounting systems, and the existence of asymmetric information. Asimakopoulou and Athanasoglou (2013) examine 145 bank M&A transactions in Europe from 1990 to 2004, finding an insignificant effect on acquirers. Bidder banks enjoy value creation in domestic deals with listed targets and in deals with smaller and less efficient banks. Hankir *et al.* (2011) consider an international sample of 600 bank mergers from 1990 to 2008 intending to identify the prevailing M&A motive. As far as the European banking sector is concerned, the authors calculate insignificant excess returns for bidders.

More recent studies on the value creation of European bank M&As are those of Tsangarakis *et al.* (2013) and Beltratti and Paladino (2013). Tsangarakis *et al.* (2013) examine 172 acquirer financial institutions participating in consolidation deals over the period 2000-2006 and reveal insignificant excess returns. Acquirers create value in small deals and when they bid for unlisted institutions, while the results between domestic and cross-border transactions are alike. Similar findings are presented by Beltratti and Paladino (2013) who focus on the financial crisis of 2007-2010.

The literature on the wealth effects of M&As in the Greek banking sector provides mixed results. Asimakopoulou *et al.* (2005) examine 7 Greek bank mergers between 1998 and 1999, reporting significant positive abnormal returns for acquirers. Similar results are found in Mylonidis and Kelnikola (2005) who assess 9 Greek bank mergers during the period from 1999 to 2000. Vergos and Christopoulos (2008) examine the period from 1998 to 2007 and find that the wealth effects on bidders are affected dramatically by the targets' domicile. Domestic deals lead to both short-term and long-term value appreciation, suggesting that the market power hypothesis is a leading determinant for value creation. In contrast, cross-border deals prove to be value-destroying strategic decisions. Manasakis (2009) examines a diversified sample of 20 acquisitions between 1995 and 2002 where at least one of the participants was a Greek public bank. His overall findings reveal an insignificant market reaction for acquirers, while statistically negative effects arise in horizontal deals. Similarly, Liargovas and Repousis (2011) and Karamanos *et al.* (2015) find that Greek banks neither gain nor lose from the activity of M&As. Fotis *et al.* (2011) analyse 16 Greek listed companies that are involved in 13 requested derogations from suspension during the period 1995-2008 applying three different event study methodologies and find positive and statistically significant results for the requested firms. Fotis and Polemis (2012) examine the short-run effects of four mergers from 2006 to 2010 reporting mixed results. In a recent study, Fotis *et al.* (2015), considering a sample of 22 listed companies in the Athens Stock Exchange, find positive results for both the merged firms and their rivals around the announcement day. A stylised fact in many of the above studies is the significant positive excess returns observed prior to the announcement of M&As, hence casting doubt on the existence of the semi-strong form of the efficient market hypothesis in the Greek market.

2.2 Government-assisted M&As

The implications of government intervention on value creation to acquiring banks has also attracted scholars' interest. Empirical evidence comes from the US banking sector, where the majority of studies find a significant positive market reaction for bidders (Cowan and Salotti, 2015; Zhang, 1997; Bertin *et al.*, 1989; James and Wier, 1987). Cochran *et al.* (1995) underline the significance of the relative size between bidders and targets, calculating significant abnormal returns when both the acquirer and the failed bank are large institutions. James and Weir (1987) argue that acquirer gains are, in essence, wealth transfers from the resolution agency to the acquiring banks. Similarly, Cowan and Salotti (2015) support subsidization as an implicit form of wealth transfer. Bertin *et al.* (1989), Cochran *et al.* (1995) and Zhang (1997) suggest that bidder excess returns are due to the underpricing of target banks' value. Whether the source of acquirer gains is attributed to public funds or major discounts in targets' assets, is a subject of debate. In any case, the US studies do not examine M&A deals under a prolonged period

of economic crisis under which Greek resolution mergers took place. The risk of financial contagion from a failing bank to the economy as well as to neighboring countries, or even the EU, made systemic stability the number one priority of the national regulatory authorities and the EU/IMF.

3. Data and methodology

3.1 Legal framework: Definition of M&As

According to the European Union (EU) Merger Regulation 139/2004 [2] and Law 3959/2011 [3] on the Protection of Free Competition in Greece a concentration of undertakings arises when there is a permanent change in control as a result of: a) the merger in any way of two or more previously independent undertakings; b) the acquisition, by one or more persons already controlling at least one undertaking, or by one or more undertakings, of direct or indirect control of the whole or parts of one or more undertakings. The acquisition is implemented through purchase of securities or assets, by contract or by any other means. Under the legal framework provided by the Greek Law and the EU Regulation, we construct two separate samples. The first sample includes all bank M&As in which the acquiring firm takes control of the target firm after the completion of the deal. The second sample includes all bank transactions in which the acquirer has a minority ownership after the completion of the deal. In both samples, we exclude transactions between non independent firms in order to capture the “pure” financial effect of the Greek crisis upon bank M&As and bank transactions.

3.2 Sampling procedures

The information on bank M&As and bank transactions between 01/01/1997 and 31/12/2018 is taken from Thomson Reuters [4]. For a deal to remain in the sample, it must comply with the following criteria. (1) The acquirer is a Greek bank listed on the Athens Stock Exchange (ASE); (2) the target is a private, a public or a subsidiary firm, domiciled inside or outside of Greece; (3) the deal is completed before the end of the sample period; (4) the acquirer has sufficient stock price data 270 days preceding and 20 days following the announcement (completion) day in Thomson Reuters, and financial statement information at the year-end prior to the announcement available from Worldscope. Excluded from the sample are: (1) deals announced by the same acquirer within 20 days to eliminate confounding information effects; (2) government-assisted deals involving failing banks, and (3) LBOs, Spin-offs, recapitalizations, self-tenders, exchange offers, repurchases and privatizations. This selection process results in 51 bank M&As and 28 bank transactions that satisfy the criteria and remain in the sample. It is worth mentioning that the sample of M&As is larger than that of similar studies reported in the literature (Karamanos *et al.*, 2015; Liargovas and Repousis, 2011; Manasakis, 2009; Vergos and Christopoulos, 2008; Asimakopoulos *et al.*, 2005; Mylonidis and Kelnikola, 2005).

The sample of government-assisted deals is identified based on the announcements of the Resolution Measures Committee [5] and the Hellenic Financial Stability Fund (HFSF) [6]. The national authorities applied resolution measures to 14 credit institutions, 7 commercial banks and 7 cooperative banks. The final sample of government-assisted deals includes 10 cases, since on two different dates three announcements by the same acquirer took place.

3.3 Measurement of abnormal returns

The wealth effects of bank M&As, bank transactions and government-assisted deals are assessed by applying univariate analysis, while the announcement period abnormal returns of bank M&As are examined by multivariate regression analysis. By univariate analysis, we estimate the abnormal returns for acquirers upon merger announcement and completion, before and after the 2008 crisis, and, then, we compare these returns for each sub-period. With regard to government-assisted M&As, the announcement day is the same as the day of completion; therefore, we estimate the abnormal returns upon their announcement/completion day. By multivariate analysis, we intend to explain the announcement period abnormal returns of bank M&As after controlling for several - firm, deal and industry specific - factors that it is possible to affect acquirers' gains.

We use the event study methodology to assess the impact of the consolidation and restructuring activity in the Greek banking sector on the value of acquirers. We estimate the abnormal returns using alternative asset pricing models. First, the market model is employed as shown in Eq. 1.

$$\hat{R}_{it} = \alpha_i + \beta_i R_m + \varepsilon_{it} \quad (1)$$

Where \hat{R}_{it} is the expected return of firm i at day t , α_i and β_i are the model's intercept and slope respectively, R_m is the return of the market portfolio and ε_{it} is the error term with zero mean and constant variance $\varepsilon_{it} \sim N(0, \sigma^2)$. As a proxy for market portfolio, we use the ASE General Index. The model's parameters are estimated using the Ordinary Least Squares (OLS) method over 250 trading days (clean window), starting 21 days prior to the announcement day.

Although the event study methodology is well developed, a critical concern with regard to its effectiveness is the infrequent trading phenomenon. This appears when stocks do not trade daily in the stock market (for more, see Fotis and Polemis, 2011; Dimson, 1979; Scholes and Williams, 1977). The sample under scrutiny contains M&As and transactions announced by Greek banks, which are very liquid and trade with high frequency. The Greek stock market is characterised as bank-based and banks are main components of both the ASE General Index and the ASE Large Capitalization Index. Therefore, for the companies included in the sample the infrequent trading phenomenon does not appear [7].

Another issue related to the event study methodology is the intervalling-effect bias, which refers to the sensitivity of beta estimates to the length of the interval return (for more, see Fotis *et al.*, 2015; Hong and Satchell, 2014; Milonas and Rompotis, 2013). The intervalling-effect bias may also be related to the infrequent trading phenomenon (Dimson, 1979; Scholes and Williams, 1977). Additionally, there are voices in the literature arguing that the OLS estimation method tends to overestimate the beta coefficients (Armitage and Brzeszczynski, 2011) and that the OLS exhibits the highest bias and lowest standard errors (Sercu *et al.*, 2008). To enhance the robustness of our results, we re-estimate our empirical models using the Scholes and Williams (1977) method and a GARCH (1,1) method. The former has been found to improve the bias of the OLS method (Fotis *et al.*, 2015), while the latter is thought to be adequate for capturing time-varying volatility and volatility clustering effects (Yang *et al.*, 2019; Fotis, 2012; Bollerslev, 1986). The results from both methods are similar to those of the OLS method [8].

The expected returns are also estimated applying the Carhart four-factor model (Carhart, 1997) as shown in Eq. 2.

$$\hat{R}_{it} - R_f = \alpha_i + \beta_m(R_m - R_f) + \beta_{SMB}SMB + \beta_{HML}HML + \beta_{MOM}MOM + \varepsilon_{it} \quad (2)$$

Where \hat{R}_{it} is the expected return of firm i at day t , R_f is the risk-free return, α_i is the model's intercept, β_m , β_{SMB} , β_{HML} , β_{MOM} are the factors' coefficients. R_m is the return of the market portfolio, SMB is a size factor, HML is a value factor, MOM is a momentum factor and ε_{it} is the error term as in Eq. 1. We use historical market data for European Fama-French and momentum factors from Kenneth French's web site [7].

We chose to apply multiple event windows to capture the value effects in different time periods relative to the merger announcement and completion. Based on the literature and for reasons of comparability, we apply two pre-announcement event windows (-20,0) and (-5,0), three symmetric event windows (-20,20), (-5,5) and (-1,1), and three post-announcement event windows (0,20), (0,50) and (0,1).

To determine the statistical significance of our results we follow Brown and Warner (1980). The statistical significance of medians is assessed with the Wilcoxon test. The significance of the differences between the means of two groups is tested with the t -test of equality of means. The significance of the differences between the medians of two groups is tested with the Mann-Whitney U test for medians.

3.3 Cross-sectional analysis

In order to analyze the determinants of acquirer's gains, we use a multivariate regression framework. Prior literature suggests that a number of factors relating to acquiring banks, deal characteristics and industry features have an effect on acquirer's abnormal returns. The multivariate linear regression model is employed as shown in Eq. 3:

$$CAR_{i(t_1,t_2)} = \beta_0 + \sum_{j=1}^m \beta_j X_{ij} + \varepsilon_i \quad i = 1 \dots N \quad (3)$$

Where the dependent variable is the cumulative abnormal return $CAR_{i(t_1,t_2)}$ of the acquiring bank from deal i for the period (t_1, t_2) . The intercept β_0 measures the abnormal returns of acquirers after controlling the effects of all explanatory variables. X_{ij} is a vector of explanatory variables, β_j is a vector of the estimated coefficients of the explanatory variables and ε_i is the error term.

We follow the merger literature in order to control for firm and deal factors that have power in explaining the abnormal returns for acquiring firms, including the age of the acquirer (*AGE*), the market-to-book ratio of the acquirer (*MTB*) and the size of the acquirer (*SIZE*). Based on extant literature on bank mergers, we control for bank specific characteristics that have explanatory power over acquirers' excess returns. More specifically, five variables are included as proxies for profitability (*PROF*), risk profile (*RISK*), asset utilization (*ASSET*), leverage (*LEV*) and liquidity (*LIQ*). (*PROF*) is measured by the return on assets ratio. (*RISK*) is measured by the provision for loan losses to total loans ratio. (*ASSET*) is defined as the ratio between total loans and total assets. (*LEV*) is defined as the ratio of total debt to common equity. (*LIQ*) is measured by the ratio of total loans to total deposits. In addition to firm-specific variables we utilize the deal features to account for potential implications of the targets' domicile (*GEO*), industry (*IND*) (i.e., bidder and target share the same 2-digit Standard Industrial Classification (SIC) code) and listing status (*STATUS*). Also, to control for the effect of the crisis, we use a dummy variable (*CRISIS*), and to control for the competitive level in the banking industry, we use the 5-bank asset concentration (*CONC*). Table I presents the summary statistics of all the above variables.

[Table I here]

4. Empirical results

The first part of this section presents the results of the event study, while the second part discusses the results of the cross-section regression analysis for the excess returns of acquirers upon the announcement of bank M&As.

4.1 Univariate analysis of acquirers' gains

4.1.1 Announcement abnormal returns of bank M&As and bank transactions

Table II presents the cumulative abnormal returns (CARs) upon bank M&As and bank transactions over various event windows surrounding the announcement day. Panels A and B present the CARs for both samples estimated with the market model and the four-factor model, respectively. The first and second columns of Panel C report the mean and median differences between the two models, while columns three and four report their statistical significance. The Table shows that the abnormal returns around the announcement of bank M&As range at low levels (from -1.98% to 0.55%) and lack statistical significance. With regard to bank transactions, the abnormal returns are positive (from 0.18% to 1.45%), albeit not statistically significant. In bank M&As the percentage of firms with positive results is below 50% in the majority of the event windows, while in bank transactions the respective percentages are, in many cases, slightly better. The market model and the four-factor model yield similar results for both samples and the differences between the two models are not statistically significant across all the applied event windows (Panel C). In line with previous studies (Karamanos *et al.*, 2015; Asimakopoulos and Athanasoglou, 2013; Beltratti and Paladino, 2013; Tsangarakis *et al.*, 2013; Hankir *et al.*, 2011; Manasakis, 2009), our results lead to the conclusion that both bank M&As and bank transactions neither create nor destroy shareholder value.

[Table II here]

4.1.2 Examination of abnormal returns before and after the crisis

Table III presents the announcement abnormal returns of bank M&As with respect to the crisis period. Panels A and B report the CARs for acquiring banks before and after the crisis, while Panel C reports

the mean and median differences between the two sub-periods, along with their statistical significance. In both models, the pre-crisis returns are mainly negative, presenting statistical significance at the 5% and 10% levels in the (0,5) and (-5,5) event windows, respectively. After the crisis, acquiring banks experience enough higher, positive and negative, excess returns which are statistically significant in a few event windows. The sign and statistical significance of the mean and median differences between the pre-crisis and the post-crisis periods do not suggest any value-reducing effects after the crisis (Panel C). In the majority of the event windows the differences are statistically indistinguishable from zero, post-crisis returns are higher in three event windows, while the opposite occurs in one case. Therefore, the results demonstrate a neutral crisis effect on the valuation of M&As in the announcement period. With regard to bank transactions, acquirers experience insignificant abnormal returns both before and after the crisis, while the differences between the two sub-periods are not statistically significant in any event window (Table IV).

[Tables III and IV here]

4.1.3 Completion abnormal returns of bank M&As - Before and after the crisis

Table V shows the abnormal returns for acquirers upon the completion of bank M&As with regard to the crisis. The results are contradictory in the two sub-periods, since they are not significantly different from zero prior to the crisis (Panel A) and significantly negative thereafter (Panel B). Both estimation models show a strong negative market response at the completion of M&As, since the returns range from -3.42% to -33.36% and are statistically significant at the 5% and 10% levels. Furthermore, the differences between the two sub-periods in mean CARs are found to be statistically significant (at 5% and 10%), with both models, in three event windows. It should be noted that the negative completion abnormal returns wiped out any gains accrued to bidders at the initial announcement of the deal. Although an effective due diligence process is essential according to Beltratti and Paladino (2013), during the triple crisis the Greek banks failed in their attempt to implement such a process and assess the dynamics prevailing in the economic landscape.

[Table V here]

4.1.4 Government-assisted deals

Table VI reports the market reaction for successful bidders surrounding the announcement of the decisions of the Resolution Measures Committee and the HFSF. Contrary to the literature (Cowan and Salotti, 2015; Zhang, 1997; Bertin *et al.*, 1989; James and Wier, 1987), we find that government-assisted deals cause significant losses to acquirers. The excess returns exceed -35% and -10% in the (-20,0) and (-5,0) event windows, respectively, and are statistically significant at the 1% level. Abnormal returns appearing during the pre-announcement period could be taken to imply that there is either information leakage or exploitation of inside information, a phenomenon which has been highlighted in the literature (Asimakopoulos and Athanasoglou, 2013; Campa and Hernando, 2006; Beitel *et al.*, 2004). After the announcement, the returns become positive but not statistically significant. Evidently, successful bidders fail to benefit from any wealth transfer from the resolution agencies or discounts in targets' assets.

[Table VI here]

4.2 Cross-sectional analysis of acquirers' gains

The following paragraphs present the results of multivariate cross-sectional regression analysis (Eq. 3) intending to identify the effect of several determinants that are likely to influence the abnormal returns of acquiring banks upon the announcement of M&As. In order to enhance the robustness of results we: (a) winsorize at the 1% and 99% levels to reduce the effect of possibly spurious outliers, (b) quantify the severity of multicollinearity using the variance inflation factors (VIFs), and (c) use robust standard errors.

4.2.1 Announcement CARs

We apply the CARs of the (0,5) event window calculated with the four-factor model as the dependent variable. Table VII reports the results of several model specifications highlighting certain bank-specific characteristics and deal features that have the most significant role in explaining the variance of the dependent variable. Among the firm variables, (*AGE*) and (*LIQ*) have a significant positive impact on abnormal returns. The market may have concluded that banks with longer history and, thus, lower information asymmetry, as well as banks with higher liquidity, are in a better position to exploit economic benefits arising from mergers. Regression results provide partial support for a negative effect of (*MTB*) and (*RISK*) on bidder returns. This suggests that banks with high growth opportunities and banks with high risk experience wealth loss upon the merger announcement. The other firm-specific variables have no explanatory power over the bidders' excess returns, considering that the estimated coefficients lack statistical significance in almost all models.

In addition, certain deal characteristics contribute significantly to explaining the abnormal returns variance. Geographically focused transactions as well as bank-to-bank deals have a significant positive effect on acquirers' gains. Our interpretation is that both factors reduce information asymmetry and deal opacity, thus increasing the likelihood of success. The role of the target's listing status remains insignificant across all model specifications. The estimated coefficients of (*CRISIS*) are not statistically significant, a fact which further supports the results of the univariate analysis. This finding corroborates the argument of a neutral crisis effect. It is also consistent with the conjecture that during a crisis the timing of market reaction is different and investors postpone repricing of shares upon the final outcome of the initial merger announcement. Furthermore, we find (*CONS*) to be relevant, implying that increased market power is a source of value creation for acquiring banks.

[Table VII here]

4.3 Additional analysis

We run a variety of tests in order to confirm our findings. We use CARs of (-5,0) calculated with the market model as the dependent variable. We maintain (*AGE*) and (*MTB*) in order to account for possible effects of information asymmetry and growth potential, respectively, and we change all the other firm-specific variables. To control for the (*SIZE*) of the acquirers, we use the natural logarithm of their market capitalization 21 days preceding the deal announcement. With regard to profitability (*PROF*), we use the return on earning assets ratio. Also, we use different proxies for (*RISK*), (*ASSET*), (*LEV*) and (*LIQ*). (*RISK*) is measured by the reserves for loan losses to total loans ratio. (*ASSET*) is defined as the ratio between invested assets and total assets. (*LEV*) is defined as the ratio of total assets to common equity. (*LIQ*) is measured by the ratio of cash and securities to total deposits.

Furthermore, during a crisis period, firms face increased uncertainty which in turn affects the level of their investment (Bloom, 2009). Baker *et al.* (2016) introduced an index of economic policy uncertainty (EPU) that serves as a proxy for the intensity of policy-related economic uncertainty in a country or a region. Nguyen and Phan (2017) and Bonaime *et al.* (2016) find a significant relationship between EPU and the wealth effects deriving from M&A deals in the US. Hardouvelis *et al.* (2018) construct an EPU index for Greece as well as category-specific EPU indices, intending to explore their association with the Greek economy and the crisis. For the purposes of our analysis, we construct the Greek Banking Policy Uncertainty (*EPUB*) variable, measured by the natural logarithm of the weighted average of the EPUB index values [8] three months before the merger announcement.

Table VIII reports the results of several robustness checks. With regard to bank-specific variables, the results confirm the positive effect of (*LIQ*) and the partially negative effect of (*MTB*) and (*RISK*) on acquirers' excess returns. Interestingly, (*PROF*) turns out to be significant in explaining the cross section of CARs. Also, the results confirm that activity and geographically focused M&As contribute significantly to explaining the variance of bidders' abnormal returns. Considering the (*EPUB*) variable, we find a statistically insignificant relationship between acquires' excess returns and the uncertainty prevailing in the banking sector. Our last finding implies that in periods of increased uncertainty announcement period returns are not distinguishable from zero.

[Table VIII here]

Other untabulated robustness tests include the use of CARs calculated in other short event windows surrounding the merger announcement as well as the use of CARs calculated with the market model using the method of Scholes and Williams (1977). Generally, the results of these procedures confirm the findings presented in the above paragraphs.

5. Summary and conclusion

We examine the wealth effects of bank M&As in Greece focusing on the period after the global financial crisis. The motivation for this study is to investigate the economic implications of the consolidation and restructuring activity in the unique Greek setting given the triple crisis phenomenon, namely banking, sovereign debt and economic crises. The study extends current knowledge by demonstrating that the valuation of M&As in the banking sector during a crisis period is indeed different from that during normal periods. Due to substantial uncertainty in the economy and on the financial system, the market is more cautious in reacting to a merger transaction upon the announcement period, postponing its reaction to the completion of the deal. The announcement of a potential deal represents the initiation of a due diligence process for the financial and business risks associated with the acquisition of the selected target. This process is expected to provide valuable information to acquirers with regard to the financial situation of the target and the prospects of the deal. Bank assets are considered to be particularly opaque during the crisis, considering the substantial increase of NPLs and the losses from the PSI. Uncertainty over the value of the target's assets raises doubts about the effectiveness of the merger, which in turn causes a negative market reaction at the completion date. Consistent with that conjecture, we find statistically insignificant abnormal returns upon the announcement of M&As and significant negative returns upon the announcement of deal completion.

The study also contributes to the literature by examining the wealth effects of government-assisted M&As in a European country. Although the national authorities transferred to the successful bidders only the healthy and viable parts (in the case of commercial banks) or the deposits (in the case of cooperative banks) of the banks under resolution, the results for acquirers are disappointing and much worse compared to prior evidence from the US. Evidently, the resolution authorities, the independent auditors and the bidding banks failed to accurately estimate the fair value of assets and liabilities of the resolved banks. Considering the market reaction upon the completion of M&As and upon the announcement/completion of government-assisted deals, we suggest that the consolidation activity in Greek banking caused significant shareholder value destruction, which is unprecedented in the EU.

The findings of this research have important implications for banks, institutional and private investors, and policy makers. For banks, the negative market reaction upon the completion of M&As during the crisis indicates that in periods of financial turmoil the creation of shareholder value should probably be pursued through other strategic decisions. Moreover, banks have to be better prepared to deal with economic uncertainty, improving the selection process of potential targets, as well as the process of due diligence in order to thoroughly and reliably estimate the target's assets and financial performance. Considering the increased opaqueness in banking during the crisis, acquirers should be able to evaluate loan portfolios, government securities and other trading assets of target banks more precisely.

This research provides investors with useful insights when assessing potential investments. The capital contribution of the private sector during the crisis was approximately €26 billion (World Bank, 2016), implying that investors either underestimated the financial risks or overestimated the banks' growth opportunities and strategic plans, or both. The type of crisis, as well as its depth and main causes, should make investors more aware of the risks associated with the implementation of strategic planning. Another important implication for investors is that the development of abnormal returns caused by bank M&As is different during a crisis period than normal periods. The market reacts partially at the announcement of a merger bid, postponing the valuation of bidders upon the announcement of deal completion. Therefore, in periods of increased uncertainty investors should take position after the announcement of M&As, a strategy that can lead to great opportunities.

Policy makers could also benefit from the findings of this study in evaluating, structuring and implementing interventions in the banking sector. It should be noted that the public sector also participated in share capital increases, injecting more than €37 billion (World Bank, 2016) into the banking system. However, policy makers failed to protect the public funds since both the voluntary and government-assisted M&As wiped out a significant proportion of these funds. Considering also that the resolution cost amounted to approximately €15 billion, we could conclude that the financial stability and the prevention of further deepening of the banking crisis with possible contagion effects was achieved at the expense of shareholders and taxpayers. Public authorities in collaboration with the EU/IMF would have to preserve the funds injected into the banking system implementing value-added strategies. In such a case, the government would be able to sell its equity stakes at a profit and return this money to taxpayers. One key lesson learned from the Greek crisis and the intervention of the EU/IMF is the need for closer and more effective cooperation among all involved authorities. The capital infusion in the banking sector and the application of resolution measures to a number of failed banks, should have been done in the context of a well-designed restructuring plan of the banking sector. This would safeguard depositors' confidence, restore stability in the banking sector and allow banks to implement effective development strategies, such as M&As.

Limitations of this study constitute the grounds for future research in the field and should be acknowledged. In order to enhance the validity of our findings, we focus on the banking industry. However, this limits the generalizability of results. A key challenge for future research is the examination of the wealth effects and the timing of market reaction upon M&A deals in other business sectors. This would facilitate more general conclusions with regard to the pattern of the abnormal returns during a crisis period. Another limitation of this study is that it employs an event study methodology to assess the economic implications of bank M&As. Future studies could apply other methodological approaches, such as dynamic efficiency studies and performance studies. Such perspectives would measure the success of M&As in terms of post-merger cost and/or profit efficiency, and accounting performance. Finally, this research examines the wealth effects of bank M&As in Greece. In the aftermath of the global financial crisis many other European countries, such as Portugal, Ireland, Spain and Cyprus, also faced economic and financial difficulties. A comparative assessment of the economic impact of the M&A transactions in the banking sector would offer useful insights to scholars, market participants and public policy makers.

Notes

[1] The national authorities applied resolution measures to 14 credit institutions, while the resolution costs exceeded €15 billion (World Bank, 2016).

[2] See Article 3 para 1 of Regulation 139/2004 (available at: <https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX%3A32004R0139>).

[3] See Article 5 para 2 of Law 3959/11 (available at: <https://www.taxheaven.gr/laws/law/index/law/312>).

[4] Barnes *et al.* (2014) suggest that, from 1984 onward, Thomson Reuters is the best database for studies in M&As.

[5] Available at: <http://www.bankofgreece.gr/Pages/en/Bank/LegalF/decisionseme.aspx>

[6] Available at: <http://www.hfsf.gr/en/news.htm>

[7] Fotis *et al.* (2011) suggest the same in a study of 16 companies listed in the ASE during the period 1995–2008.

[8] For brevity, the results are not reported and are available upon request from the authors.

[9] Available at: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

[10] Specifically, to assign heavier importance in the most recent months relative to merger announcement, the weighted average EPUB index values are constructed as follows:

$$EPUB_t = 50\% \times EPUB_{t-1} + 33.33\% \times EPUB_{t-2} + 16.66\% \times EPUB_{t-3}.$$

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